Discretionary Loan Loss Provisions And Earnings Management For The Banking Industry

Ruey-Dang Chang, (Email: raychang@mail.nsysu.edu.tw), National Sun Yat-Sen University, Taiwan
Wen-Hua Shen, (Email: js1216@ms6.hinet.net), National Sun Yat-Sen University, Taiwan
Chun-Ju Fang, (Email: fcj@thu.edu.tw), Tunghai University, Taiwan

ABSTRACT

The purpose of the study is to investigate the relation between discretionary loan loss provisions and 6 indicators of bank operating performance for the period 1999-2004 under controlling the type of bank, ownership status and asset size. Besides, we investigate whether bank managers intend to use discretionary loan loss provisions as a means for earnings management. Based on the empirical results from the Taiwan Economic Journal (TEJ) database, the study finds: (1) the two earnings-related variables, namely earnings before loan loss provisions and one-year-ahead earnings, are significantly related to discretionary loan loss provision; (2) non-performing loans is significantly related to discretionary loan loss provisions, but non-performing loans ratio and bad debts coverage ratio are not found to be significantly linked to discretionary loan loss provisions; (3) capital adequacy ratio is not significantly related to discretionary loan loss provisions. Finally, our findings indicate that bank managers may use discretionary loan loss provisions to engage in earnings management when the earnings before loan loss provisions or non-performing loans are at a high level.

Keywords:　Earnings Management, Discretionary Loan Loss Provisions, Non- Performing Loans Ratio, Capital Adequacy Ratio

INTRODUCTION

$\mathcal{P}$rior research generally concludes that managers engage in earnings management for many reasons and probably exercise their accounting discretion to influence reported earnings. First, they manipulate earnings because of capital market incentives, including implementing management buyouts plan, initial public offerings (IPO), seasoned equity offerings and mergers plan, to meet earnings forecasts or to smooth income, etc. Second, they implement earnings management because of contracts motivation (e.g. management compensation plans, debt agreement or job preservation). Third, they conduct earnings management due to regulation motivation, such as import regulation, industry regulation and antitrust law, etc. Regardless of whichever causes managers to manipulate earnings, the behavior of earnings management implies conflict of interest between managers, owners, and minority shareholders.

The bank managers, like managers in other industries, have incentives to "adjust" earnings and maximize bank and/or manager's wealth. The only difference is the method used to engage in earnings management. Unlike managers in other industries, bank managers usually utilize loan loss provisions to influence earnings reported. Collins et al. (1995) examine the impact of individual bank's changing levels of capital, earnings and taxes on decisions to engage in some capital-raising options. They expect low levels of nondiscretionary current earnings will encourage managers to realize investment security gains as well as decrease loan loss provisions and conclude a positive relation between earnings and loan loss provisions. Shrieves and Dahl (2003) also indicate bank managers intend to realize short-term security gains or losses and utilize loan loss provisions to smooth earnings.

Prior research documents that banks intend to execute transactions and manage accruals to achieve primary capital, tax, and earnings goals (Moyer, 1990; Scholes et al., 1990; Collins et al., 1995). In practice, banks' managers may attempt to manipulate earnings and capital because of compensation plan and/or job preservation. Just like

other industries, earnings (including tax consideration) is one of the most important indicator in performance measurement for bank managers. In addition to earnings, non-performing loan ratio and capital adequacy ratio (hereafter, capital ratio) are the other two key indices to measure manager's performance. Hence, under compensation incentive and job preservation consideration, they will endeavor to improve earnings, raise capital ratio and keep non-performing loans ratio below standard level in order to meet their goals. Once they cannot reach the target, they may use accruals, loan loss provisions, loan charge-offs, realization of gains or losses of securities or miscellaneous gains and losses to "adjust" the figures of earnings, capital ratio and non-performing loans ratio. In practice, bank managers have discretionary powers to influence the level of loan loss provisions. Collins et al. (1995) and Anandarajan et al. (2007) find that the loan loss provisions are further used to manage earnings. Once bank managers raise the level of loan loss provisions, the second tier capital and capital ratio will increase through loan charge-offs process accordingly. In prior related studies, they employed discretionary loan loss provisions to examine earnings-smoothing motivation (Kanagaretnam et al., 2003; Kanagaretnam et al., 2004), signal effect (Ahmed et al., 1999; Kanagaretnam et al., 2004; Eng and Nabar, 2007), the influence of bonus schemes on accounting decisions (McNichols and Wilson, 1988) or the motivation of capital management (Beatty et al., 1995; Ahmed et al., 1999).

In order to examine whether bank mangers use discretionary loan loss provisions to adjust earnings, we first construct bad debts estimation model according to the model developed by McNichols and Wilson (1988). Then we view the regression residual as discretionary loan loss provisions estimation and use the estimated discretionary loan loss provisions as a proxy of earnings management. We conjecture (1) a significant positive relation between discretionary loan loss provisions and two earnings-related variables (i.e. earnings before loan loss provisions and one-year-ahead earnings); (2) a significant positive relation between discretionary loan loss provisions and three bad-debts-related variables (i.e. non-performing loans, non-performing loan ratio and bad debts coverage ratio). But we expect a negative relation between discretionary loan loss provisions and capital adequacy ratio.

The remainder of our paper is organized as follows. Section 2 presents prior research and hypotheses development. In Section 3, we describe sample and data selection. Section 4 presents and discusses the results. Then we conclude this paper in Section 5.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Prior Research

Watts and Zimmerman (1978) assume that individuals act to maximize their own utility. So managers may lobby on accounting standards based on their own self-interest. They elaborate on the factors, namely, taxes, regulation, management compensation plans, bookkeeping cost and political costs, which are expected to affect firm's cash flows. Among those factors, regulation (represents government intervention) may affect a firm investment-production decisions and cause a firm to manage its reported earnings. Schipper (1989) states earnings management as "disclosure management" in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gains. The statement of earnings management is based on a view of accounting numbers as information. It could occur in any part of the external disclosure process and could take a lot of forms.

A large number of studies investigate managers' decision for evidence of earnings management, including choice as to accounting methods, changes in methods, and accrual strategies (Healy, 1985; Dechow and Sloan, 1991; Lewellen et al., 1996; Bernard and Skinner, 1996). Healy and Wahlen (1999) indicate that "if financial reports are to convey managers' information on their firms' performance, standards must permit managers to exercise judgment in financial reporting." It means that managers have the right to determine accounting methods, accrual choices and other accounting items which may influence reported earnings. Under accounting flexibility within GAAP, managers can use their private information and knowledge about the business to select reporting methods, estimates, and disclosures that can match their benefits.

In addition to studies about accounting choices for firms in non-bank industries, several papers have examined managerial discretion in financial service firms with respect to loan loss provisions and the sale of investments (e.g., Moyer, 1990; Scholes et al., 1990; Collins et al., 1995; Beatty et al., 1995). They focus on discretionary behavior motivated by earnings, capital adequacy management, and tax management. But what do

bank managers exactly do to engage in earnings management? As literature documented, they may use accounting choices, timing of recognition of bad debts, sale of securities and / or discretionary accruals to influence reported earnings. For example, Clinch and Magliolo (1993) find bank managers may use discretionary behavior including the recognition of sales to influence earnings. Shrives and Dahl (2003) find that, under the Basel Accord, Japanese banks may exploit gains on securities sales and loan loss provisions to smooth reported earnings and replenish regulatory capital. Ahmed et al. (1999) find bank managers intend to use loan loss provisions for capital management. Additionally, they find negative relation between loan loss provisions and future earnings changes.

Hypothesis Development

Several studies suggest that the signaling incentive may play an important role in bank's loan loss provisions decision (Griffin and Wallach, 1991; Liu, 1995). In practice, in order to reflect real status of loans and also comply with regulation, it is a necessary process for banks to recognize loan loss for potential uncollectible loans. Liu and Ryan (1995) suggest that bank managers have more discretion over loss provisions for large and frequently renegotiated loans, such as foreign and commercial loans, than for small or infrequently renegotiated loans, e.g. consumer loans, and find that market reaction to loan loss provisions is positive for banks with a high portion of large and frequently renegotiated loans. Besides, Elliot et al. (1991) and Wahlen (1994) find that market reacts positively to bank's loan loss provisions announcements and unexpected loan loss provisions, respectively. As bank managers can arbitrarily decide the timeliness of loan loss provisions during the year, they can make use of loan loss provisions to influence reported earnings. Greenawalt and Sinkey (1988) find positive relationship between loan loss provisions and operating income before provision of loan losses and indicate that bank managers tend to engage in income smoothing behavior. When actual earnings are far lower (higher) than expected earnings, managers may make use of underestimating (overestimating) the amount of potential uncollectible loans on purpose and decrease (increase) the provision of loan losses in order to smooth earnings. Collins et al. (1995) document that heterogeneity among bank's capital, earnings, and tax strategies is linked to size, growth and profitability. They find that profitable banks may use loan loss provisions to manage earnings. We hypothesize as follows:

H$_{1a}$: Ceteris paribus, banks with higher earnings before loan loss provisions report relatively larger discretionary loan loss provisions.

The provision of loan losses in the banking industry is primarily based on requirement of regulation in Taiwan. In accordance with relative regulations, bank managers must classify loans into five categories based on risk assessment, and then use the predetermined proportion to calculate the amount of the provision for potential loan losses per month. Ceteris paribus, once bank managers decide to raise the amount of loan loss provisions substantially in current year, it means that the amount of loan loss provisions possibly will decrease considerably and cause earnings improvement next year. Wahlen (1994) indicates that when future cash flow prospects improve, bank managers may raise the discretionary component of unexpected loan loss provisions. They find a positive relation between annual unexpected provisions and future changes in cash flows as far as three years ahead. Beaver and Engel (1996) adopt the concept of signaling motivation and follow Wahlen (1994) to incorporate one-year-ahead and two-year-ahead earnings in the model to estimate discretionary portion of the allowance account. They view discretionary allowance as a signal for better future earnings and expect a positive relation between them. But Ahmed et al. (1999) provide no evidence of earnings management through loan loss provisions. They find that loan loss provisions are negatively related to both future earnings changes and contemporaneous stock returns. As the literature provides different results about the relation between loan loss provisions and future earnings, we test the relation between year-ahead-earnings and loan loss provisions and expect that higher year-ahead-earnings are associated with high level of loan loss provisions in current year. We hypothesize as follows:

H$_{1b}$: Ceteris paribus, banks with higher year-ahead-earnings report relatively larger discretionary loan loss provisions.

According to the Basel Capital Accord, the capital ratio is calculated using the definition of regulatory capital and risk-weighted assets and used by regulators to measure bank capital adequacy. The capital ratio must be no lower than 8% (Collins et al., 1995; Basel Committee on Banking Supervision, 2004). One of the purposes for banks to manage capital is to maintain the capital ratio above the minimum of 8%. The authorities will limit the bank's activities when its capital ratio can't reach the minimum requirement. Accordingly, inadequate capital ratio will bring banks unnecessary controlling costs. Moyer (1990) finds that bank managers intend to select accounting

procedures to raise capital ratio to avoid additional controlling costs. Beatty et al. (1995) provide evidence of negative relation between loan loss provisions and capital ratio. Collins et al. (1995) expect that the calculation of the primary capital ratio indicates capital is augmented by increasing the loan loss provisions and/or decreasing loan charge-offs, but empirically find banks with low capital appear to decrease discretionary loan loss provisions for capital ratio consideration. As capital ratio plays an important role as an indicator to reflect the risk status of the bank, it indicates bank's abilities to survive under current capital structure and implies the invisible risk of default. Lin and Chen (1997) refer to the study of Liu (1985) and indicate banks with inadequate capital ratio may use discretionary loan loss provisions to augment capital ratio. Although Ahemd et al. (1999) suggest that after implementing the new Basel Capital Accord, the negative relation between loan loss provisions and capital management has decreased. Chen (2002) documents that commercial banks in Taiwan still exploit loan loss provisions to influence capital and raise capital ratio. As prior studies have examined the behavior of capital management using loan loss provisions, we test whether banks with higher capital ratio report less discretionary loan loss provisions and hypothesize as follows:

H₂: Ceteris paribus, banks with higher capital ratio report relatively larger discretionary loan loss provisions.

According to the regulations in Taiwan, non-performing loans mainly refer to all loans in the portfolio more than 3 months overdue on interest or principal payments, or the loans less than 3 months overdue but banks sued debtors for default already, or took legal action to disposal collateral. Under the pressure from authorities and market, bank managers may be forced to increase the provision of loan losses. Once managers increase discretionary loan loss provisions, the other performance indicators, such as earnings, non-performing loans ratio and capital ratio, will be impacted. Therefore, when bank managers decide to increase discretionary loan loss provisions this year and then write off the uncollectible loan accordingly, it will cause decreasing in both earnings and non-performing loans ratio at the same time. When the earnings after loan loss provisions still remain positive, the loan charge-offs will reduce the amount of risk-weighted assets in portfolio, then enhance the capital ratio. On the contrary, when loan loss provisions cause a large number of losses in net income, it will cause the decrease of both capital and risk-weighted assets simultaneously and lower capital ratio if the magnitude of the reduction in capital is more than risk-weighted. Similarly, when bank managers implement loan loss provisions according to real risk status and the rules of relative regulation completely, the discretionary loan loss provisions will approach zero, and won't affect earnings, non-performing loans ratio and capital ratio anymore.

In view of the long-term performance, bank managers may prefer to increase discretionary loan loss provisions in order to improve the quality of assets and lower the non-performing loans ratio in the future. They may sacrifice earnings this year to exchange for better performance next year, if they expect that it is unable to achieve the goals this year. But in view of the short performance, bank managers may be compelled to decrease loan loss provisions because of compensation plans and job preservation motivation. Namely, it will overstate reported earnings or understate negative net income. Therefore, the magnitude of discretionary loan loss provision may be affected by some key indicators with respect to performance measurement. We expect the amount and ratio of non-performing loans may influence managers' will to increase or decrease discretionary loan loss provisions. Therefore, we hypothesize as follows:

H₃ₐ: Ceteris paribus, banks with higher non-performing loans report relatively larger discretionary loan loss provisions.

H₃ᵦ: Ceteris paribus, banks with higher non-performing loans ratio report relatively larger discretionary loan loss provisions.

The level of non-performing loans ratio indicates the general quality of loans portfolio. The downward trend in non-performing loans ratio means the quality of total loans has been improving and vice versa. As non-performing loans ratio is calculated by dividing non-performing loans by total loans, high non-performing loans ratio means that a relatively large number of interests and principals will be uncollectible. Other than non-performing loans ratio, another ratio, namely bad debts coverage ratio, indicates the proportion of allowance for bad debts in potential uncollectible loans. When the bad debts coverage ratio reaches 100%, it means that the bank has already prepared for all the potential uncollectible loans. Once the potential uncollectible loans have been confirmed as "real" bad debts, banks will accordingly write off the bad debts. As the level of bad debts coverage ratio represents bank managers' attitude to risk, banks with higher bad debts coverage ratio may remain same policies on potential uncollectible loans. Therefore, the hypothesis is established as follows:

H₃c:　　Ceteris paribus, banks with higher bad debts coverage ratio report relatively larger discretionary loan loss provisions.

RESEARCH DESIGN

A large number of papers examine managers' accrual choice to detect earnings management (Healy, 1985; Bernard and Skinner, 1996). The goal of discretionary accrual models is to separate total accruals (hereafter, TA) into discretionary and nondiscretionary components. Because discretionary accruals (hereafter, DA) are unobservable, we follow McNichols and Wilson (1988) and use proxy (DAE) to measure DA with error (η), where η is assumed to be white noise. As DAE equals to TA deducting an estimate of nondiscretionary accruals (NDAE), η represents the deviation between NDA and NDAE. Due to the positive relation between η and DAP, researchers use η as DA's surrogate. Therefore, we use the residual of loan loss provisions model to estimate discretionary loan loss provisions.

Sample Selection

Our data come from TEJ (Taiwan Economic Journal) which contains various data of public companies listed in the Taiwan Stock Exchange. We select 1999 through 2004 as the period of analysis and obtain 164 firm-year observations. The empirical analysis involves a two-step procedure. First, the provision of loan losses is modeled as a linear function of loan charge-offs and beginning balance of allowance for bad debts. The estimated residuals from the first-stage regression provide the estimate of discretionary loan loss provisions used in the second stage as dependable variable.

Model of Loan Loss Provisions

We estimate loan loss provisions with a set of variables including loan charge-offs and beginning balance of allowance for bad debts. McNichols and Wilson (1988) use estimated residuals of bad debts regression model as a surrogate of discretionary accruals. Loan loss provisions equal to the sum of the ending balance of allowance for bad debts and loan charge-offs, then deducting the beginning balance of allowance for bad debts. In practice, most bank managers decide the amount of loan loss provisions every month according to individual risk assessment on potential uncollectible loans and loans write-offs. Accordingly, we use the following regression to estimate loan loss provisions, and treat regression residuals as discretionary loan loss provisions:

$$LLP_t = \beta_0 + \beta_1 CO_t + \beta_2 B\_BAL_t + \varepsilon_t \tag{1}$$

Where:

LLP_t: loan loss provisions in year t
CO_t: loan charge-offs in year t
B_BAL_t: the beginning balance of allowance for bad debts
ε_t: residuals
t: year

Model Of Discretionary Loan Loss Provisions

Since discretionary loan loss provisions cannot be directly observed, it is estimated by regressing loan loss provisions on the explanatory variables in Eq. (1). The residual from Eq.(1) is taken to be an estimate of discretionary loan loss provisions. We regress the explanatory variables, namely earnings before loan loss provisions, one-year-ahead earnings, non-performing loans, non-performing loans ratio and bad debts coverage ratio, and test our hypotheses by estimating the coefficients in the following model.

$$DLLP_t = \gamma_0 + \gamma_1 GOVERN_t + \gamma_2 CATA_t + \gamma_3 lnASSET + \gamma_4 BP\_EARN_t + \gamma_5 EARN_{t+1} + \gamma_6 BIS_t + \gamma_7 R\_NPL_{t\,t} + \gamma_8 NPL_t$$
$$+ \gamma_9 R\_COVER_t + \varepsilon_t \tag{2}$$

Where:

$DLLP_t$: discretionary loan loss provisions in year t
$GOVERN_t$: an indicator variable equal to 1 when the bank's ownership is controlled mainly by government and 0 otherwise
$CATA_t$: an indicator variable equal to 1 when the bank is classified as a commercial bank and 0 otherwise
$lnASSET_t$: natural logarithm of total assets at the end of year t
BP_EARN_t: earnings before loan loss provisions at the end of the year
$EARN_{t+1}$: one-year-ahead earnings, i.e. earnings in year t+1
BIS_t: capital ratio at the end of year t
NPL_t: total non-performing loans in year t
R_NPL_t: non-performing loans ratio at the end of year t
R_COVER_t: bad debts coverage ratio (i.e. loan loss provisions at the end of year t over total non-performing loans)
t: year

We follow Wahlen (1994), Collins et al. (1995), Ahmed et al. (1999) and Kanagaretnam et al. (2004) using discretionary loan loss provisions as response variable to test our hypotheses. The five explanatory variables in Eq.(2), namely BP_EARN_t, $EARN_{t+1}$, NPL_t, R_NPL_t, and R_COVER_t are added to the model to test our hypotheses. BP_EARN_t equals to bank's earnings before loan loss provisions at the end of the year. We calculate BP_EARN_t by summing the provisions of loan losses and earnings before taxes, and divide loan loss provisions at the end of the year by total non-performing loans to compute R_COVER_t. As to $EARN_{t+1}$, NPL_t and $R\_NPL_{t,}$ they are collected directly from TEJ database.

In addition, we include several factors that are likely to affect bank managers' discretionary loan loss provisions. First, the bigger the company is, the larger the agency problem may be (Gabor, 1985). The natural logarithm of total assets ($lnASSET_t$) is included because large banks have more resources as well as abilities to make profits and hence are more likely to avoid using discretionary loan loss provisions to manipulate earnings. Second, Betty et al. (2002) find that publicly listed banks may use discretionary loan loss provisions and realization of securities gains to avoid earnings decrease. It implies that the ownership structure may influence managers' behavior of loan loss provisions. We indicate $GOVERN_t$ as 1 if the government is the controlling owner of the bank and has the right to nominate the chairman of board, and 0 otherwise. Finally, As the type of bank exhibits different business activities and assets portfolio, we include $CATA_t$, an indicator variable equal to 1 if the bank is classified to the group of commercial banks and 0 otherwise, in Eq.(2).

EMPIRICAL ANALYSIS

Descriptive Statistics For Sample

Table 1 presents sample distribution according to year, $CATA_t$ and $GOVERN_t$. Our sample firms report that the state-owned banks and non-state-owned banks are about 30% and 70% respectively. Approximately 76% of the sample banks belong to the group of commercial banks. Table 2 shows that 64% of the sample are non-state-owned commercial banks and 12% are state-owned commercial banks.

Table1: Sample Distribution

Year	Owner Status		Total	Type		Total
	State-Owned	Non-State-Owned		Commercial Banks	Other Banks	
1999	0	3	3	3	0	3
2000	9	24	33	26	7	33
2001	10	23	33	25	8	33
2002	10	23	33	25	8	33
2003	10	21	31	23	8	31
2004	10	21	31	23	8	31
Total	49	115	164	125	39	164

Table 2: Sample Classification

Owner Status	Commercial Banks (%)	Non-Commercial Bank (%)	Total
Non-State-Owned	105 (64%)	10 (6%)	115 (70%)
State-Owned	20 (12%)	29 (18%)	49 (30%)
Total	125 (76%)	39 (24%)	164 (100%)

Regression Result

First, we incorporate those potential decision-influencing factors[1] documented in prior research in the regression model. We check scatter plot and coefficient significance of each variable, and finally select both loan charge-offs and the beginning balance of allowance for bad debts as explanatory variables to estimate the bank's provision of loan losses. Table 3 reports the descriptive statistics of loan loss provisions (LLP_t), the beginning balance of allowance for bad debts (B_BAL_t) and loan charge-offs (CO_t).

Table 3: Descriptive Statistics of the Variables in Eq.(1)

	Sample Size	Minimum	Maximum	Mean	S.D.
LLP_t	164	-0.7	52.41	5.31	7.48
B_BAL_t	164	0.11	21.19	4.29	3.76
CO_t	164	0.00	52.57	5.67	7.67

LLP_t : loan loss provisions in year t   units: NT$100 millions
B_BAL_t: beginning balance of allowance for bad debts in year t
CO_t : loan charge-offs in year t

In Table 3, the standard deviation of those variables, especially for LLP_t and CO_t, is relatively large compared with mean. It exhibits a substantial divergence between banks' behavior of loan loss provisions and loan charge-offs and implies different level of pressure born by every individual bank. Table 4 represents the correlation between variables.

Table 4: Correlation Coefficient between Variables in Eq.(1)

Variables	LLP_t	B_BAL_t	CO_t
LLP_t	1.000		
B_BAL_t	0.567***	1.000	
CO_t	0.973***	0.633***	1.000

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level
See Table 3 for variable definitions.

In Table 4, we find that the correlation coefficient between LLP_t and CO_t is 0.973 (p<0.01) and the correlation between LLP_t and B_BAL_t is 0.567 (p<0.01). It indicates that both B_BAL_t and CO_t may influence LLP_t. Table 5 is the regression result of Eq.(1). If we use CO_t as the only explanatory variable to LLP_t. The R square of Eq.(1) is about 0.946. After adding the B_BAL_t, the adjusted R square of Eq.(1) increases to 0.950. The coefficient of CO_t and B_BAL_t is 1.000 (p<0.01) and -0.164 (p<0.01), respectively. It implies that with one unit of loan charge-offs, bank managers will replenish the allowance for bad debts to the original amount before loan charge-offs. In addition, the coefficient of B_BAL_t is negative (-0.164) which indicates that one unit increase of B_BAL_t will cause LLP_t to decrease 0.164 units.

In practice, banks in Taiwan are required by regulation to classify assets to five categories based on risk assessment. Bank managers must follow the regulations to accomplish loan loss provisions every year accordingly. As we can see in Table 5, one unit of increase in CO_t will cause one unit of increase in LLP_t. It implies that bank

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[1] We use the factors including the beginning balance of allowance for bad debts, loan charge-offs, the ending balance of allowance for bad debts, loan charge-offs in previous year, total uncollectible loans, interest receivable, total amount of credit loans, loan loss provisions in the previous year and assets

managers intend to maintain same level of loan loss provisions during our sample period. The difference between the actual provision of loan losses and expected provision according to the specific provision proportion on potential uncollectible loans (grouping by risk assessment) is what we call "discretionary loan loss provisions".

Table 5: Regressing Results of Eq.(1)

Variables	Estimated coefficient	t-value	p-value
Constant	0.339	1.709	0.089
B_BAL_t	-0.164	-3.645	0.000***
CO_t	1.000	45.282	0.000***
Sample size	164		
F-value	1,548		
Adjusted R^2	0.950		

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level
See Table 3 for variable definitions.

Besides, the Durbin-Watson test shows the statistic D is 1.897. To avoid potential autocorrelation, we use the Cochrane-Orutt procedure to eliminate the problem of autocorrelated errors. Table 6 shows that the regression result of Eq.(1) has no autocorrelation problem. If bank managers intend to raise earnings, they may underestimate the risk of specific loans and lift up the rating of potential uncollectible loans in order to decrease the provision of loan losses.

Table 6: The Regressing Result of Eq.(1) under the Cochrane-Orutt Procedure

Variables	Estimated coefficient	t-value	p-value
Constant	0.362	1.842	0.067
B_BAL_t	-0.183	-3.979	0.000***
CO_t	1.004	45.514	0.000***
Sample size	163		
F-value	1,523		
Adjusted R^2	0.949		

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level
See Table 3 for variable definitions.

Hypothesis Tests

We use the result in Table 6 to calculate the residual as the surrogate of discretionary loan loss provisions. Incorporating ownership status ($GOVERN_t$), the type of bank ($CATA_t$) and bank size ($lnASSET_t$) into Eq.(2) as control variables, we use earnings before loan loss provisions at the end of the year (BP_EARN_t), one-year-ahead earnings ($EARN_{t+1}$), capital ratio at the end of the year (BIS_t), total non-performing loans (NPL_t), non-performing loans ratio at the end of the year (R_NPL_t) and bad debts coverage ratio (R_COVER_t) as explanatory variables to test our hypotheses.

Table 7 exhibits the descriptive statistic of explanatory variables as well as control variables on Eq.(2). The standard deviation of BP_EARN_t, $EARN_{t+1}$ and NPL_t is 7.12, 7.59 and 19.62. But the mean of those variables is 6.21, 0.80 and 17.17, respectively. It implies a substantial divergence in earnings performance and non-performing loans between banks. Table 8 shows the regression results of Eq.(2).

Table 7: Descriptive Statistic of variables in Eq. (2)

Variables	Sample Size	Minimum	Maximum	Mean	S.D
$DLLP_t$	130	-7.18	8.51	0.20	1.63
$lnASSET_t$	130	3.73	7.60	5.83	0.82
BP_EARN_t	130	-20.41	32.50	6.21	7.12
$EARN_{t+1})$	130	-36.82	17.67	0.80	7.59
BIS_t	130	1.04	19.77	10.31	2.38
R_NPL_t	130	0.82	30.25	5.95	4.89
NPL_t	130	0.29	95.51	17.17	19.62
R_COVER_t	130	0.09	7.68	0.39	0.67
Sample Size	130				

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

$DLLP_t$: discretionary loan loss provisions in year t

$lnASSET_t$: natural logarithm of total assets at the end of the year

BP_EARN_t: earnings before loan loss provisions at the end of the year

$EARN_{t+1}$: one-year-ahead earnings

BIS_t: capital ratio at the end of year t

NPL_t: total non-performing loans in year t

R_NPL_t: non-performing loans ratio at the end of year t

R_COVER_t: bad debts coverage ratio in year t (i.e. loan loss provisions at the end of the year over total non-performing loans)

Table 8: Regressing Results of Eq.(2)

Variables	Estimated coefficient	Standardized coefficient	t	p value	VIF
Constant	7.147	-	2.749	0.007***	-
$GOVERN_t$	-0.571	-0.161	-1.005	0.317	4.829
$CATA_t$	0.582	0.153	1.267	0.208	2.425
$lnASSET_t$	-1.539	-0.771	-3.544	0.001***	7.876
BP_EARN_t	0.086	0.377	3.112	0.002***	2.440
$EARN_{t+1}$	0.063	0.293	2.703	0.008***	1.953
BIS_t	0.044	0.064	0.703	0.484	1.374
R_NPL_t	-0.018	-0.053	-0.421	0.674	2.665
NPL_t	0.062	0.748	3.923	0.000***	6.041
R_COVER_t	-0.044	-0.018	-0.227	0.821	1.086
Sample Size	130				
F-value	5.133				
Adjusted R2	0.224				

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

$GOVERN_t$: an indicator variable equal to 1 when the bank's ownership is controlled mainly by government and 0 otherwise

$CATA_t$: an indicator variable equal to 1 when the bank is classified as a commercial bank and 0 otherwise

See Table 7 for definitions of other variables.

In Table 8, the variance inflation factor (VIF) for all variables is all smaller than 10, therefore, the multicollinearity between variables is not serious. The coefficient of BP_EARN_t (0.086, p<0.01) indicates positive relation between earnings before loan loss provisions and discretionary loan loss provisions. It suggests that bank managers intend to raise the provision of loan losses to write off bad debts as well as reduce the non-performing loans ratio. The coefficient of $EARN_{t+1}$ (0.063, p<0.01) means positive relation between one-year-ahead earnings and discretionary loan loss provisions. It suggests that managers may use discretionary loan loss provisions to lift one-year-ahead earnings up intentionally. Finally, the coefficient of NPL_t (0.062, p< 0.01) shows positive relation between non-performing loans and discretionary loan loss provisions. It suggests when the amount of non-performing loans increases, bank managers may increase the provisions of loan losses in order to reduce the non-performing loans ratio. We conclude that the hypotheses H_{1a}, H_{1b} and H_{3b} are supported. As for H_2, H_{3a} and H_{3b}, the coefficients on BIS_t, R_NPL_t and R_COVER_t are insignificant at conventional levels. Thus, the results in Table 8 do not support the hypotheses H_2, H_{3a} and H_{3b}.

As for the other control variables, the coefficient of $lnASSET_t$ (-1.539, $p<0.01$) indicates that the larger the bank is, the smaller the discretionary loan loss provisions are. But our results do not find significant evidence about the influence of both $GOVERN_t$ and $CATA_t$ on discretionary loan loss provisions.

Analysis On Earnings Management

The deviation between the actual provisions of loan losses and the estimated loan loss provisions calculated by regression Eq.(2) represents the discretionary loan loss provisions. No matter what the sign of the discretionary loan loss provision is, we use the absolute value of the deviation as a surrogate of earnings management. We further divide the sample into two groups according to the mean of the absolute value of $DLLP_t$ and each explanatory variable respectively. Table 9 exhibits the results of the t-test.

Table 9: Results of the t-test for ABS($DLLP_t$) and Explanatory Variables

Variables	Group	Mean of ABS($DLLP_t$)	p value
BP_EARN_t	High	1.8303	0.000***
	Low	0.6239	
$EARN_{t+1}$	High	1.1398	0.194
	Low	0.8394	
BIS_t	High	1.0652	0.692
	Low	0.9838	
R_NPL_t	High	1.2734	0.112
	Low	0.9210	
NPL_t	High	1.7319	0.000***
	Low	0.7624	
R_COVER_t	High	1.2004	0.232
	Low	0.9417	

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level
ABS($DLLP_t$): the absolute value of the earnings before loan loss provisions in year t
See Table 7 for the definitions of other variables.

Our findings in Table 9 indicate that the means of ABS($DLLP_t$) in high BP_EARN_t group and in high NPL_t group are larger than those in low BP_EARN_t group and in low NPL_t group. Namely, bank managers intend to use discretionary loan loss provisions to influence reported earnings when they have high earnings before loan loss provisions or high non-performing loans.

SUMMARY AND CONCLUSION

Prior studies about loan loss provisions mainly focus on the effects of discretionary loan losses provisions on earnings management, capital management, taxes management and stock return. We use financial data of the Taiwanese banks through the period of 1999-2004 to investigate the factors which may affect the discretionary provision of loan losses. Our findings provide evidence of a positive link between discretionary loan loss provisions and the earnings before loan loss provisions, as well as one-year-ahead earnings and non-performing loans. When the earnings before loan loss provisions increase, bank mangers may increase discretionary loan loss provisions so as to alleviate the pressure of high non-performing loans ratios. Under the same consideration, bank managers may raise the discretionary loan loss provisions when non-performing loans are at a high level. Besides, when the one-year-ahead earnings increase, it may be caused at the expense of current year's earnings. But we do not find evidence on the relation between discretionary loan loss provisions and capital ratio, non-performing loans ratio and the bad debts coverage ratio.

Finally, our findings indicate a positive relation between the absolute value of discretionary loan loss provisions and the earnings before loan loss provisions, as well as non-performing loans. This suggests that banks with high earnings before loan loss provisions and high non-performing loans may intend to increase or decrease discretionary loan loss provisions for the purpose of earnings management.

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<u>NOTES</u>