輔仁管理評論
中華民國 104 年 5 月，第二十二卷第二期，41-64

Bank's Use of Credit Derivatives and Earnings Management of Borrower

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(Received February 11 2015; First Revised March 6 2015; Accepted March 25 2015)

ABSTRACT

This study conducts the corporate governance role of bank by detecting the impact of bank's use of credit derivatives on borrower's earnings management behavior. In financial markets all investors, including banks, benefit from the hedge and speculation functions offered by credit derivatives. Referring to the risk sharing property of credit derivatives, the specialness of bank in lending activity is challenged. This study conducts whether the use of credit derivatives of lending banks reduces their engagement in supervision by examining the change in earnings management of borrowers in lending process. Using a micro data set of private bank loans in Taiwan, this study finds weak evidence supporting the relation between bank's use of credit derivatives and borrower's earnings management. The impact of credit derivatives on earnings management is governed by the size of lending and bank's intention in joining credit derivatives transactions. The evidence shows that the holding of credit derivatives for non-trading purpose brings in lower earnings management for large loan size, but credit derivatives named for trading purpose has no impact on managerial discretions. In brief, credit derivatives called for non-trading purpose appear to be the complement to other hedge devices used by bank.

Keywords: Credit derivatives, earnings management

I. INTRODUCTION

The numerous growths in credit derivatives market in recent years have changed the role of banks in financial system (Instefjord, 2005; Hirtle, 2009). Traditionally, banks are viewed as the key institution offering funds to companies suffering from information asymmetry and lack of access to external capital markets. Banks' advantages to some extent are associated with their supervision on borrowers (Diamand, 1984; Fama, 1985; James, 1987). The monitoring function following bank loan is regarded as an important device in resolving agency problem (Diamand, 1984; Hoski et al., 1991). However, recent scholars examine that financial market innovations such as loan sale and securitization allow banks to offload credit risk following lending activities and thereby alter their preference

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of risk taking (e.g., Hirtle, 2009). Srifi (2009) and Hirtle (2009) address that innovations in financial markets have changed price and non-price terms in bank loans. In addition to the change in lending behaviors, in this study I examine whether the innovation of credit derivatives alters borrowers' involvement in manipulating earnings.

Much of the earnings management literature asserts that the use of debt is associated with managing earnings (Gupta, Khurana, & Pereira, 2008). To prevent from financial distress firm close to restrictive covenants would manipulate financial reporting (Fung & Goodwin, 2013). Meanwhile, banks are viewed as supervisors in lending process with the concern of its advantage in information gathering and less possibility of free-ride problem (Campbel & Kracaw, 1980; Diamond, 1984; Fama, 1985). Therefore, bank lending transaction offers a perfect venue to investigate how innovations in financial markets affect real business activities. In this study I explore how earnings management is related to bank's use of credit instruments. Credit derivatives are the latest innovations that bring in huge impacts on financial markets. The market for credit derivatives has experienced dramatically growth after 2000. In the U.S. the notional amounts of credit derivatives reached to $45.5 trillion in the mid of 2007, about a 50-fold increase from the level at the mid of 2001 (Hirtle, 2009).

Researchers claim that financial market innovations such as loan sale and securitizations allow banks to disperse credit risks and thereby enhance banks' lending activities, represented by increasing the amount of credit supply as well as more risky loans (Cebenoyan & Strahan, 2004; Gande & Saunders, 2012). The change in the lending preference of banks following those innovations also produces another debate on the feature of traditional bank specialness. Previous studies, such as James (1987), Lummer and McConnell (1989), and Best and Zhang (1993), address borrowers' abnormal stock return around new bank loan announcement as the evidence of bank specialness. However, recent studies of Parlour and Plantin (2008) and Gande and Saunders (2012) suggest that innovation in financial markets alters the traditional role of banks in monitoring. Active secondary loan market reduces the incentive of banks to monitor its borrowers since banks could offload credit risks by selling nonperforming loans.

The impact of banks' use of credit derivatives on monitoring is ambiguous. With the concerns of advantages from the risk sharing, banks' desire on supervision

may decrease with credit derivatives. In this scenario, the use of credit derivatives may substitute for other sources of risk management such as monitoring. However, the use of credit instruments also reveals banks' propensity in hedging risks. The increase in the hold of credit derivatives presents banks' concerns of default risk as well as monitoring. In such scenario, credit instruments are viewed as the complement to other hedge devices used by banks. To detect the role of credit derivatives in managing risk, I employ another channel to address the changing monitoring effort of banks by conducting borrowers' earnings management activities when credit derivatives are available for risk management. The rationale is that the less monitoring activities of banks may facilitate borrowers' incentive to manipulate earnings to fulfil managers' self-interests and enlarge the conflicts between insiders and outside investors (Ahn & Choi, 2009).

My main results are summarized as follows. First, there is only limited evidence in describing the association between banks' use of credit derivatives and earnings management of borrowers. Borrowers' earnings management varies with credit derivatives only when the amount of bank loan is large. In particular, trading purpose and non-trading purpose of credit transactions results in distinct impacts. There is no significant relationship between earnings manipulation and credit derivatives when the hold of derivatives is identified as trading purpose. By contrast, the increase in the hold of credit derivatives for purpose other than trading generates lower earnings management. That implies banks do not alter their monitoring activities when they purchase more credit derivatives with the concerns of speculation motive (i.e. trading purpose). If the hold of credit derivatives is for hedging purpose (i.e. non-trading purpose), larger amount of credit derivatives represents more propensity in monitoring. Secondly, I find the negative impact of credit derivatives on earnings management is more pronounced when bank's hedge propensity is high. This evidence is also consistent with the hedge motive argument of credit derivatives. In all, I suggest that credit derivatives do not dilute the monitoring incentives of banks when banks purchase these instruments to create speculation opportunities, in which costly monitoring activities are not of their interests. However, the use of credit derivatives triggered by hedging purpose is the complement to other hedge devices. Banks who dislike financial distress would utilize credit derivatives and monitoring to prevent unfavorable default events.

The introduction of credit derivatives is a double-edged sword. On the one hand, the risk-sharing function offered by credit derivatives reduces the likelihood of bank insolvency. On the other hand, credit derivatives intensify the adverse selection problem in loan-sale markets. The former improves banks performance with the concern of risk management, while the latter destroys banks value because of the breakdown of loan sale markets (Duffee & Zhou, 2001). Therefore, the net effect of credit derivatives on banks is an empirical issue. But to date the investigation of this issue remains empty. Using lending activities in Taiwan, this study explores the association between banks' holding of credit derivatives and borrowers' earnings management, proxy by discretionary accruals. The uniqueness of Taiwanese sample relies on the fact that we can distinguish bank's intentions in credit derivatives transactions, including trading purpose and non-trading purpose. In the U.S. bank regulatory reports only reveals the total nominal amounts of credit derivatives. By conducting credit derivatives held for non-trading purpose, we can examine whether banks' engagement in monitoring alters with this new financial instrument. This channel helps us to verify the specialness of banks in financial markets and the adverse selection problem in secondary loan market.

An important contribution relative to earlier work is that I examine that the impact of credit derivatives on earnings management is contingent on banks' intention in joining derivatives market as well as the loan size. Credit derivatives can be viewed as the complement to other hedge devices. The use of credit derivatives does not undermine the monitoring role of banks. On the contrary, credit derivatives allow banks to manage risks in a more flexible way. In brief, the corporate governance role of banks remains even when credit instruments are introduced.

II. LITERATURE REVIEW

2.1 Bank monitoring effect

In literature banks are viewed as an important mechanism in resolving information asymmetry in financial markets (Campbel & Kracaw, 1980; Leland & Pyle, 1977). The monitoring function offered by lending banks constructs a significant part in describing the uniqueness of bank loans (Diamond, 1984; Fama,

1985). Previous studies asserts that the positive abnormal return found in bank loan announcement is associated with the value-enhancing activities arising from the role of banks in monitoring client firms (James, 1987; Lummer & McConnell, 1989).

Although the uniqueness of banks is well-documented in literature, some studies argue that the specialness of bank at best is mixed. Best and Zhang (1993) argue that the information production role of lending banks is only significant for the borrowing companies with information asymmetry. Besanko and Kanatas (1993) point out the moral hazard problem arising from lending banks when banks are reluctant to serve as supervisors in lending business. In addition, Byers, Fields, and Fraser (2008) show that the corporate governance role offered by bank monitoring is apparent when internal corporate governance is weak and borrowers are not threatened by merge activities. Since monitoring is costly, banks would choose an optimal level of efforts to balance the pros and cons of monitoring.

2.2 Innovation in financial markets and bank loan

Financial innovations have created a lot of changes in financial markets and to the extent stimulate economic activities and facilitate economic growth. However, the development of structural finance products (Cebenoyan & Strahan, 2004; Gande & Saunders, 2012) and the deregulation process (Jiang, Li, & Shao, 2010; Xu, 2009) also challenge the specialness of banks. It is argued that the introduction of loan sales in the 1980s and securitization in the 1990s have resulted in significant changes in bank operation including asset portfolios, lending activities, and source of funds (Cebenoyan & Strahan, 2004; Duffee & Zhou, 2001; Loutskina, 2011).

Nowadays, the net effect of financial innovations to market participants is still ambiguous. The so-called financial innovations include the better devices of acquiring information and the introduction of new products. Research has examined in economics with information asymmetry financial innovations would improve risk-sharing; but such diversification in fact leads to welfare-reducing effect (Marin & Rahi, 2000). The declining marginal costs of acquiring information from innovations also facilitate the introduction of new financial products and the corresponding liquidity because of the less information asymmetry between buyers and sellers (Wang, 2006). The improvement in risk management arising from

financial innovations allows financial institutions such as banks to increase their leverage as well as make more risky loans (Cebenoyan & Strahan, 2004). Particularly, with the protection from credit derivatives, banks would reduce their monitoring effort and worsen the moral hazard problem of banks (Acharya & Johnson, 2007; Gande & Saunders, 2012). Although prior studies notice that bank role has changed with the improvement in risk management, most evidences are related to lending behaviors or stock prices reaction from announcement effect.

Financial innovations also challenge the traditional specialness of banks by varying banks' incentive on monitoring borrowers. Parlour and Plantin (2008) propose a theoretical model to prove that an active secondary loan market dampens banks' engagement in supervision. Furthermore, the empirical evidence of Gande and Saunders (2012) also demonstrates that the special role of banks has changed with the secondary loan market. The active loan sale markets produces less monitoring of borrowers by banks due to risk-shifting by stockholders at the expense of existing bondholders. They find that borrowers' bonds experience a negative cumulative abnormal return around the first day of trading its loans. This is consistent with the argument that banks' monitoring incentive decreases with loan sale markets.

Credit derivatives stand for an important credit market innovation that, theoretically, facilitates lending banks' ability in risk management when conducting lending business and increases the efficiency in financial markets when allocating loanable funds. Since investors may join credit derivatives market for trading and non-trading purposes, researchers claim that hedge demand and/or speculation demand could bring in different impacts on banks' activities and performance (Hirtle, 2009).

The main goal of this study is to provide empirical evidence about the impact of credit derivatives on borrowers' earnings management. In particular, I ask the extent to which borrowers' discretionary accruals changes when the lending banks increase their use of credit derivatives to reduce credit risk exposures. Accordingly, I propose the first hypothesis that credit derivative alter earnings management of borrowers due to the varying monitoring effect of lending banks.

H1a: The use of credit derivatives increases earnings management when use of credit instruments is the substitute to other forms of risk management.

H1b: The use of credit derivatives decreases earnings management when use of credit instruments is the complement to other forms of risk management.

Next, I detect whether a bank's propensity to hedge alters the impact of credit derivatives on earnings management. The use of credit derivatives in preventing unfavorable default risk and the corresponding loss offers similar outcome to every trader. However, banks may vary their involvement in monitoring to generate distinct synergy in credit derivatives. Since each firm has different propensity in risk management, some banks may be more active in risk management than others and enhance the impact of credit derivatives. For example, Cebenoyan and Strahan (2004) find that banks active in loan sale market have lower risk and higher profits than other banks. Therefore, I hypothesize that when banks are engaged more in hedging default risks, the use of credit derivatives for hedging purpose generates more reduction in earnings management.

H2: The impact of credit derivatives on earnings management is magnified by the propensity to hedge.

III. METHODOLOGY

The data used in this study is extracted from Taiwan Economic Journal database, including bank loans information, credit derivatives transactions of banks, and financial information at firm level. The sample covers the 2007 to 2011 period and consists of 18878 firm-year observations.

To examine how the use of credit derivative alters the borrower's earnings management, I employ the Ahn and Choi (2009) model as my benchmark. The dependent variable in this study is earnings management that gauges the degree to which managers manipulate the financial reporting. Consistent with previous studies, I employ the Jones' model and modified Jones model (Dechow, Sloan, & Sweeney, 1995; Jones, 1991) to calculate the discretionary accruals and view it as the proxy for earnings management. We run annual cross-sectional regressions of the following model for each of the industry group defined in TEJ. According to

Jones (1991) model, discretionary accruals are obtained from the residual variable according to the following equation:

$$\frac{TA_{it}}{Asset_{it-1}} = \alpha + \beta_1 \frac{1}{Asset_{it-1}} + \beta_2 \frac{\Delta REV_{it}}{Asset_{it-1}} + \beta_3 \frac{PPE_{it}}{Asset_{it-1}} + \varepsilon_{it}. \quad (1)$$

The variable *TA* stands for total accruals, defined as [change in current assets – change in current liabilities – change in cash + change in debt in current liabilities – depreciation and amortization expense]. The variables *Asset, ΔREV*, and *PPE* in Eq. (1) represent total assets, change in sale, and gross property, plant and equipment, respectively. *i* and t are firm and year index in order. I also explore using the version of the Modified Jones model defined as follows:

$$\frac{TA_{it}}{Asset_{it-1}} = \alpha + \beta_1 \frac{1}{Asset_{it-1}} + \beta_2 \frac{\Delta REV_{it} - \Delta AR_{it}}{Asset_{it-1}} + \beta_3 \frac{PPE_{it}}{Asset_{it-1}} + \varepsilon_{it}, \quad (2)$$

where *ΔAR* stands for change in accounts receivable. The discretionary accruals defined in Eq. (1) and Eq. (2) are called DA1 and DA2, respectively.

The core variable is the extent to which credit derivatives are used. Referring to Hirtle (2009) and Minton, Stulz, and Williamson (2006), I employ the amount of credit derivatives as proxy of credit protection obtained by banks. Bank regulatory reports contain information on financial derivatives for two distinct items: trading purpose and non-trading purpose. The former is with concern of speculation motive while the latter is close to hedging concerns. Therefore, I build two main variables including the notional amount of credit derivative named for trading purpose (cre_tra_loan) and the notional amount of credit derivative named for non-trading purpose (cre_non_loan). Both of credit derivatives amount are deflated by the aggregate amount of loans offered by banks. In addition, I use the notional amount of non-credit derivatives held for purpose other than trading as a proxy for bank's general propensity in hedging. This measure is standardized by total asset of bank and named non_cre_TA. These instruments are written on interest rate, foreign exchange, commodity, and equity derivatives.

According to Ahn and Choi (2009), I use the following variables as the possible factors governing earnings management behaviors, including bank monitoring effort and borrower-specific characteristics. Bank monitoring efforts are proxied by magnitude, measured by divided dollar value of the bank loan to total asset of borrower, length (number of years since received the first bank loan for the specified bank), and syndicated loan. The firm-specific properties cover the following variables. BM is the book-to-market ratio of equity defined as (book value of equity/market value of equity). MVE is the market value of equity. ROA is the return on assets. FCF is free cash flows measured as [operating income before depreciation – interest expenses – (income tax – deferred tax) – dividends]. Leverage is calculated as (total debt/total assets). Coverage is interest coverage ratio defined as (operating income/interest expenses). Zscore is the Altman Z-score measured as [1.2×(working capital/total assets) + 1.4×(retained earnings/total assets) + 3.3×(earnings before interest and taxes/total assets) + 0.6×(market value of equity/total debts) + 1.0×(sales/total assets)].

Referring to Ahn and Choi (2009), earnings management is measured as the signed value of the discretionary accruals shown in Eq. (1) and Eq. (2). The signed value of the discretionary accruals can detect the performance of bank monitoring since it indicates the timing of recognizing income. Positive value indicates early recognition of income while negative value represents recognizing income in latter period. The merit of later recognition of income is the increase in future cash flow and thereby enhances a borrower's ability in repaying his debt obligation. Accordingly, a decrease in discretionary accruals is favor to lending banks involve in supervision. Finally, all variables are winsorized at 1% and 99% levels.

Table 1 Summary statistics.

variable	Mean	Standard deviation	First quartile	Median	Third quartile
DA1	-0.050	0.569	-0.055	0.005	0.069
DA2	0.012	0.167	-0.052	0.006	0.068
cre_tra_loan	0.074	0.277	0	0	0.016
cre_non_loan	0.001	0.006	0	0	0
non_cre_TA	0.132	0.160	0.026	0.072	0.185
magnitude	0.017	0.025	0.003	0.008	0.019
length	6.818	6.161	1	5	11
d_syndicate	0.099	0.299	0	0	0
BM	1.243	0.751	0.726	1.079	1.574
lnMVE	15.022	1.519	13.919	14.855	16.011
ROA	0.081	0.073	0.041	0.078	0.121
FCF_sale	0.055	0.098	0.013	0.049	0.096
leverage	0.503	0.131	0.417	0.509	0.587
coverage	15.745	49.129	0.172	4.335	13.345
Zscore	2.157	1.347	1.294	1.852	2.658

This table shows the summary statistics for all variables. DA1 and DA2 present the signed discretionary accruals from Jones (1991) model and modified Jones' model, respectively. Credit derivatives usages are measured by the notional amount of credit derivative named for trading purpose (cre_tra_loan) and the notional amount of credit derivative named for non-trading purpose (cre_non_loan). Both of them are deflated by total bank loan. non_cre_TA represents the notional amount of other financial derivatives, such as interest rate, foreign exchange, commodity, and equity derivatives, divided by total asset of banks. Bank monitoring efforts are proxied by magnitude (dollar value of the bank loan / total asset of borrower), length (number of years since received the first bank loan for the specified bank), and d_syndicate (dummy variable equal to 1 when bank loan is syndicated, and zero otherwise). BM is the book-to-market ratio measured as (book value of equity / market value of equity). lnMVE is the natural log of the market value of equity. ROA is the return on asset measured as (income before extraordinary items / beginning total assets). FCF_sale is free cash flow (operating income before depreciation - interest expenses – income tax + deferred tax - dividends) divided by net sale. Leverage is measured by (total debt / total assets). Coverage is interest coverage ratio measured as (operating income / interest expenses). Zscore is the Altman Z-score measured as [1.2×(working capital/total assets) + 1.4×(retained earnings/total assets) + 3.3×(earnings before interest and taxes/total assets) + 0.6×(market value of equity/total debts) + 1.0×(sales/total assets)]. The number of observations is 18878.

Table 1 reports the descriptive statistics for the sample firm-year observations. Similar to previous studies, the earnings management is measured by the signed discretionary accruals from Jones (1991) model and the modified Jones model. The mean values of discretionary accruals named by DA1 and DA2 are -0.050 and 0.012, respectively. Our mean values are close to zero and consistent with those reported in prior studies (Dechow et al., 1995; Subramanyam, 1996). The credit derivatives usage of banks only contributes to a very small portion of total lending funds. The mean value of credit derivatives usage for trading (cre_tra_loan) and non-trading purpose (cre_non_loan) are 0.074 and 0.001. By contrast, non-credit derivatives transactions are more popular among banks. Non-credit derivatives

usage (non_cre_TA) has a mean (median) value of 0.132 (0.072) and interquartile range of 0.159, indicating wide variation in values for non-credit derivatives usage in the sample. Syndicated loans (d_syndicate) make up less than 10% of the sample and the amount of borrowing (magnitude) on average counts to 2% of total assets.

Table 2 Correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1)DA1	1													
(2)DA2	0.795***													
(3)cre_tra_loan	-0.024**	0.005	1											
(4)cre_non_loan	-0.048***	-0.021***	0.080***	1										
(5)non_cre_TA	-0.019**	-0.003	0.447***	0.131***	1									
(6)magnitude	0.004	-0.025***	0.001	-0.044***	-0.006	1								
(7)length	-0.022**	-0.025***	-0.147***	-0.100***	-0.067***	-0.052***	1							
(8)d_syndicate	0.020*	0.044***	0.046***	-0.022**	-0.008	0.039***	-0.005	1						
(9)BM	-0.094***	-0.097***	0.066***	0.008	0.060***	-0.075***	0.091***	0.074***	1					
(10)lnMVE	0.058***	0.109***	0.073***	-0.008	0.012	-0.294***	0.145***	0.180***	-0.293***	1				
(11)ROA	0.051***	0.126***	0.094***	0.001	0.058***	-0.108***	-0.046***	0.039***	-0.132***	0.267***	1			
(12)FCF_sale	0.018**	0.098***	0.052***	-0.003	0.040***	-0.089***	-0.056***	0.005	-0.028***	0.198***	0.665***	1		
(13)leverage	-0.025***	-0.083***	-0.023**	0.009	-0.055***	-0.064***	0.016**	0.107***	0.082***	-0.049***	-0.239***	-0.139***	1	
(14)coverage	0.059***	0.104***	0.028***	-0.014*	0.009	-0.056***	-0.032***	-0.055***	-0.162***	0.213***	0.759***	0.545***	-0.189***	1
(15)Zscore	0.121***	0.144***	0.020*	0.007	0.009	0.074***	-0.128***	-0.074***	-0.457***	0.135***	0.447***	0.034***	-0.469***	0.477***

This table presents spearman correlation coefficient**.** All variable are defined in Table 1. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 2 reports the Spearman correlations among all variables conducted in this study. The two measures of earnings management are highly correlated with coefficient equal to 0.79. The amount of derivatives for non-trading purposes is negatively correlated with earnings management. Bank monitoring measures, length and d_syndicate, is also correlated with discretionary accruals.

IV. EMPIRICAL RESULTS

The goal of this study is to investigate whether the use of credit derivatives on lending banks alter their monitoring activities on borrowing firms. I employ the trading and non-trading purpose of credit derivatives in gauging the strength of monitoring and use discretionary accruals of borrowing firms to represent the outcome of bank supervision. In this section I report results for testing Hypotheses 1 and Hypotheses 2. To examine the association between credit derivatives and earnings management, I regress the discretionary accruals on two measures of credit derivatives as follows:

$$\begin{aligned} EM_{it}=\alpha+\beta_1 cre\_tra\_loan_{jt-1} + \beta_2 cre\_non\_loan_{jt-1} + \beta_3 non\_cre\_TA_{jt-1} + \gamma_1 magnitude_{it} \\ + \gamma_2 length_{it}+\gamma_3 d\_syndicate_{it}+\gamma_4 BM_{it} \\ + \gamma_5 lnMVE_{it}+\gamma_6 ROA_{it}+\gamma_7 FCF\_sale_{it}+\gamma_8 leverage_{it} \\ + \gamma_9 coverage_{it} + \gamma_{10} Zscore_{it} + \varepsilon_{it}. \quad (3) \end{aligned}$$

Here I set the credit derivative usages are lagged relative to new bank loan. Presuming the use of credit derivative1s is persistent, lagged values could capture a bank's propensity to conduct in credit derivatives rather than the demand in respond to shocks. All regressions include industry and year fixed effects.

In this study earnings management is measured by discretionary accruals used by borrowing firms. Referring to the literature, I employ two proxies in describing the degree of discretionary accruals, including the Jones (1991) model and the modified Jones model (Dechow et al., 1995). Total accruals are divided into discretionary and non-discretionary accruals in both models. However, unlike Jones (1991) model, which presumes the change in revenues is irrelevant to managers' manipulation, the modified Jones model claims that accounts receivable can vary with managers' intentions. Therefore, if accounts receivables are a key device for managers to manipulate financial reporting, the use of Jones (1991)

model in calculating discretionary accruals (i.e., DA1) may underestimate the intensity of earnings management.

Table 3 Regression analysis of credit derivatives on discretionary accruals.

	Dependent var.=DA1				Dependent var.=DA2			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
cre_tra_loan		-0.004 (-0.22)		-0.007 (-0.37)		-0.014 (-0.85)		-0.015 (-0.90)
cre_non_loan			-1.365 (-0.82)	-1.399 (-0.84)			-0.346 (-1.13)	-0.417 (-1.38)
non_cre_TA		-0.123** (-1.99)	-0.110* (-1.92)	-0.106* (-1.65)		-0.002 (-0.16)	-0.007 (-0.50)	0.003 (0.19)
magnitude	-0.568 (-1.09)	-0.566 (-1.08)	-0.578 (-1.11)	-0.577 (-1.11)	-0.305*** (-2.71)	-0.030*** (-2.69)	-0.308*** (-2.72)	-0.306*** (-2.71)
length	-0.003** (-2.10)	-0.003** (-2.44)	-0.003*** (-2.48)	-0.003*** (-2.47)	0.0001 (0.41)	0.0001 (0.32)	0.0001 (0.27)	0.0001 (0.28)
d_syndicate	0.002 (0.03)	-0.001 (-0.02)	-0.001 (-0.02)	-0.001 (-0.02)	0.034* (1.86)	0.034* (1.85)	0.034* (1.85)	0.033* (1.84)
BM	0.006 (0.25)	0.008 (0.35)	0.008 (0.36)	0.008 (0.36)	-0.006 (-0.59)	-0.005 (-0.55)	-0.005 (-0.56)	-0.005 (-0.54)
lnMVE	-0.0002 (-0.02)	0.001 (0.17)	0.001 (0.15)	0.001 (0.16)	0.003 (1.02)	0.003 (1.09)	0.003 (1.04)	0.003 (1.08)
ROA	1.864*** (4.61)	1.881*** (4.65)	1.879*** (4.65)	1.881*** (4.65)	0.150 (1.48)	0.155 (1.52)	0.152 (1.49)	0.154 (1.52)
FCF_sale	-0.740*** (-3.34)	-0.746*** (-3.36)	-0.748*** (-3.37)	-0.747*** (-3.37)	-0.041 (-0.60)	-0.040 (-0.60)	-0.042 (-0.61)	-0.041 (-0.61)
leverage	0.515*** (4.00)	0.510*** (3.99)	0.510*** (3.99)	0.511*** (4.00)	-0.009 (-0.27)	-0.009 (-0.27)	-0.009 (-0.28)	-0.009 (-0.27)
coverage	-0.0004** (-2.22)	-0.0004** (-2.21)	0.0004*** (-2.21)	-0.0004** (-2.21)	-0.0001 (-0.76)	-0.0001 (-0.77)	-0.0001 (-0.76)	-0.0001 (-0.78)
Zscore	0.035** (1.97)	0.034** (1.94)	0.034** (1.93)	0.034** (1.93)	0.016*** (2.57)	0.016*** (2.56)	0.016*** (2.56)	0.016 (2.56)
Cons	-0.577*** (-3.25)	-0.581 (-3.27)	-0.577*** (-3.25)	-0.578*** (-3.26)	-0.044 (-0.73)	-0.048 (-0.78)	-0.044 (-0.72)	-0.047 (-0.77)
N	18878	18878	18878	18878	18878	18878	18878	18878
R^2	0.11	0.12	0.12	0.12	0.07	0.07	0.07	0.07

This table presents information on the degree of earnings management, measured by the signed discretionary accruals from Jones (1991) model (DA1) and modified Jones' model (DA2). The main variables are credit derivatives usages, including the notional amount of credit derivative named for trading purpose (cre_tra_loan) and the notional amount of credit derivative named for non-trading purpose (cre_non_loan). Both of credit derivatives usages are deflated by bank loan amount. non_cre_TA represents the notional amount of other financial derivatives, such as interest rate, foreign exchange, commodity, and equity derivatives, divided by total asset of banks, which proxy for hedge demand. Bank monitoring efforts are proxied by magnitude (dollar value of the bank loan / total asset of borrower), length (number of years since received the first bank loan for the specified bank), and d_syndicate (dummy variable equal to 1 when bank loan is syndicated, and zero otherwise). The independent variables include BM, lnMVE, ROA, FCF_sale, leverage, coverage, and Zscore. Definitions can be found in Table1. All regression analysis includes industry and year dummies. In parentheses are t-statistics adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 3 reports the regression analysis of discretionary accruals on the use of credit derivatives. To ensure the accuracy of my research design, I refer to the work of Ahn and Choi (2009) as my benchmark. Model 1 to model 4 of Table 3 examine discretionary accruals based on Jones (1991) model (i.e., DA1), while model 5 to model 8 of Table 3 use the modified Jones model to measure managers' discretion (i.e., DA2). It is revealed that the coefficient for magnitude (Model 5), as expected, is negative and significant (coeff = -0.305, *t*-value = -2.71), indicating that borrowers' earnings management decreases with the strength of bank's monitoring. Although bank loan (magnitude) is significantly negatively associated with DA2, the magnitude has no significant impact on DA1. The discrepancy regression results on DA1 and DA2 can be related to banks' abilities in resolving manipulations related to accounts receivables. Meanwhile, I find syndicated loan generates higher discretionary accruals. The coefficient for d_syndicate (Model 5) is 0.034 (*t*-value = 1.86), implying single lender bank loan having less earnings management. The coefficient of other control variables are insignificant as found in Ahn and Choi (2009), except for Zscore.

Model 2 to Model 4 of Table 3 present the impact of credit derivatives on earnings management based on Ahn and Choi (2009) model. I introduce another control variable, non_cre_TA, as a proxy for bank's general propensity to hedge its risk exposure. I examine the impact of credit derivative for trading purpose in Model 2 and that for purpose other than trading in Model 3, respectively. I combine both transactions in Model 4 of Table 3. The result shows that neither cre_tra_loan nor cre_non_loan have significant impact on discretionary accruals. The coefficient on cre_non_loan (Model 4), -1.399, is negative, but not statistically significant (t-value = -0.84). This implies that borrowers' earnings management do not vary with banks' transactions in credit derivatives market.

The insensitive of earnings management to credit derivatives may arise from the size of borrower. Hirtle (2009) has noticed that the influence of credit derivatives to credit supply is associated with borrower's size. Since firms with large size are easier to be named credits in the derivatives market, these companies would receive higher efficiency in risk management. Referring to Hirtle (2009), I employ loan size as proxy for borrower's size. I rank the whole sample according to their loan size and named large (small) loans group when loans size is larger (less) than the third (first) quintile of the distribution. I narrow down observations

to those with larger amount of bank loan and reexamine the hypothesis.

Table 4 Regression analysis of credit derivatives on discretionary accruals for loan size subsample.

	Dependent var. = DA1			Dependent var. = DA2		
	(1)	(2)	(3)	(4)	(5)	(6)
cre_tra_loan	0.030 (1.32)		0.022 (0.98)	0.012 (1.26)		0.010 (1.10)
cre_non_loan		-4.390* (-1.81)	-4.220* (-1.74)		-1.136* (-1.60)	-1.057 (-1.53)
non_cre_TA	-0.102 (-1.31)	-0.025 (-0.33)	-0.044 (-0.52)	0.009 (0.32)	0.033 (1.24)	0.023 (0.92)
magnitude	-0.707 (-1.51)	-0.746* (-1.60)	-0.739 (-1.59)	-0.398* (-1.86)	-0.410* (-1.92)	-0.406* (-1.89)
length	-0.001 (-0.77)	-0.001 (-0.79)	-0.001 (-0.79)	0.0005 (0.60)	0.0005 (0.60)	0.0005 (0.59)
d_syndicate	0.027 (0.63)	0.025 (0.60)	0.026 (0.60)	0.039* (1.69)	0.039* (1.68)	0.039* (1.68)
BM	-0.018 (-0.67)	-0.018 (-0.66)	-0.018 (-0.66)	-0.013 (-0.74)	-0.013 (-0.74)	-0.013 (-0.73)
lnMVE	-0.009 (-0.72)	-0.010 (-0.82)	-0.010 (-0.81)	-0.004 (-0.82)	-0.004 (-0.90)	-0.004 (-0.87)
ROA	0.730* (1.77)	0.730* (1.78)	0.729* (1.77)	-0.294** (-1.99)	-0.294** (-2.00)	-0.295** (-1.99)
FCF_sale	-0.389 (-1.46)	-0.382 (-1.44)	-0.386 (-1.45)	0.108 (1.33)	0.110 (1.37)	0.109 (1.35)
leverage	0.348*** (2.57)	0.348*** (2.59)	0.349*** (2.59)	-0.062 (-1.26)	-0.062 (-1.26)	-0.062 (-1.26)
coverage	-0.0002 (-1.03)	-0.0002 (-1.04)	-0.0002 (-1.02)	0.0001 (0.54)	0.00001 (0.53)	0.0001 (0.54)
Zscore	0.039* (1.76)	0.038* (1.74)	0.038* (1.74)	0.022*** (2.92)	0.022*** (2.91)	0.022*** (2.91)
Cons	-0.197 (-0.86)	-0.178 (-0.78)	-0.180 (-0.79)	0.129 (1.07)	0.134 (1.11)	0.133 (1.10)
N	4901	4901	4901	4901	4901	4901
R^2	0.09	0.10	0.10	0.12	0,12	0.12

This table presents information on the degree of earnings management for observations with large loan size. I rank all loan observations by the amount of borrowing and assign to small (large) loan group whose loan size are less (greater) than the first (third) quintile of loan size distribution. All variables are defined in Table 1. All regression analysis include industry and year dummies. In parentheses are t-statistics adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 4 reports the results of discretionary accruals regressions for observations with a large amount of borrowing. I find that for loans with large in size the increase in the hold of credit derivatives for non-trading purpose follows a significant decrease in earnings manipulation. Model 2 and 3 of Table 4 shows that

the coefficient on the use of non-trading credit derivatives (cre_non_loan), -4.39 and -4.22, are negative and statistically significant, implying that the increase in lending banks' non-trading purpose credit derivatives eliminates borrowers' earnings management. In model 5 and 6 the coefficient on cre_non_loan, -1.136 and -1.057, are negative, but less than significant. The difference between these models also arises from the detection of accounts receivables. It is hard for lending banks to identify the degree to which accounts receivables are manipulated. As a result, they have limited abilities in resolving earnings management triggered by accounts receivables. Meanwhile, the coefficient for cre_tra_loan (model 3), 0.022, is positive but not statistically significant (t-value = 0.98), implying that earnings management is not necessarily increasing with credit derivatives classified as trading motive. The unreported results using observations with small loan size reveals that the coefficient on cre_tra_loan and cre_non_loan are not statistically significant. These results suggest that for small size loans earnings management is not associated with use of credit derivatives.

Next, I examine whether the impact of credit derivatives on earnings management varies with the borrower's engaged in hedge activities. I use the interaction between credit derivative usage and the propensity to hedge (non_cre_TA) to formally examine whether the propensity to hedge enhances the impact of credit protection on earnings management. The interaction term inter_cre_tra (inter_cre_ntr) is used to represent the product of non_cre_TA and trading (non-trading) purpose of credit derivatives holding. Meanwhile, since the impact of credit derivatives appears to be sensitive to bank loan size, the examination of Hypothesis 2 is also applied for two loan size subsample.

Table 5 presents the interacted specification for observations with large amount in borrowing. The result shows that the relationship between credit derivatives and earnings management varies with bank's propensity to hedge. The coefficient on the inter_cre_ntr (model 2), -21.922, is negative and statistically significant (t-value = -2.38). I find similar result when using modified Jones' model in measuring discretionary accruals. The interaction term remain negative significant in model 6 of Table 5 (coeff = -4.046, t-value = -1.70). The estimates suggest that for banks with high propensity to hedge the use of non-trading purpose of credit derivatives results in lower earnings manipulation. By contrast, bank's propensity in hedging has no significant impact on the association between credit

instruments for trading purpose and earnings management. The investigation of moderating effect of the propensity to hedge also applies to sample with small loan size. The unreported table shows that the association between credit derivatives, trading and non-trading purpose, and earnings manipulation does not vary with hedge aptitude.

In examining the moderating effect of hedge need on the strength of bank monitoring, I also find the sensitivity of earnings management on credit derivatives is weaker for DA2. The marginal effect of interaction term (inter_cre_ntr) is -21.447 when DA1 is examined (model 3 of Table 5), while the coefficient on inter_cre_ntr is -4.406 when DA2 is conducted (model 6 of Table 5). This result is also consistent with my argument that banks are incapable of verifying the intention of accounts receivables used by borrowing companies.

Although banks can obtain default protection through credit derivatives market, the merit of credit derivative protection do not reduce bank's monitoring role in lending business. This result is consistent with the statement of Hirtle (2009) that the greater use of credit derivatives do not lead to greater supply of bank credit with certainty. In particular, Hirtle find that more credit supply accompanies higher spreads. Accordingly, he asserts the use of credit derivatives is the complement to other forms of hedge devices available to banks. My finding also suggest that credit derivative usage to some extent is the complement to other hedge devices since the increase in credit instruments results in less discretionary accruals when the amount of borrowing is large. Meanwhile, credit derivatives for speculation motives do not hamper banks' desire in supervision. These evidences suggest that the use of credit derivatives do not alter the specialness of banks in lending business.

Table 5 Regression analysis including the moderating effect of propensity to hedge for loan size subsample.

	Dependent var. = DA1			Dependent var. = DA2		
	(1)	(2)	(3)	(4)	(5)	(6)
cre_tra_loan	-0.009		-0.030	-0.002		-0.007
	(-0.23)		(-0.71)	(-0.11)		(-0.47)
cre_non_loan		11.847*	11.501*		2.031	1.890
		(1.86)	(1.84)		(1.31)	(1.24)
inter_cre_tra	0.086		0.104	0.031		0.036
	(1.11)		(1.27)	(0.98)		(1.08)
inter_cre_ntr		-21.922**	-21.447**		-4.276*	-4.046*
		(-2.38)	(-2.35)		(-1.76)	(-1.70)
non_cre_TA	-0.111	-0.006	-0.029	0.006	0.036	0.025
	(-1.39)	(-0.08)	(-0.34)	(0.21)	(1.39)	(0.98)
magnitude	-0.707	-0.737	-0.730	-0.398*	-0.408*	-0.405*
	(-1.51)	(-1.59)	(-1.57)	(-1.86)	(-1.91)	(-1.88)
length	-0.002	-0.001	-0.001	0.0004	0.0004	0.0005
	(-0.80)	(-0.70)	(-0.74)	(0.58)	(0.65)	(0.61)
d_syndicate	0.027	0.026	0.026	0.039*	0.039*	0.039*
	(0.62)	(0.61)	(0.61)	(1.69)	(1.68)	(1.68)
BM	-0.018	-0.018	-0.018	-0.013	-0.013	-0.013
	(-0.65)	(-0.68)	(-0.66)	(-0.73)	(-0.74)	(-0.73)
lnMVE	-0.008	-0.010	-0.010	-0.004	-0.004	-0.004
	(-0.69)	(-0.83)	(-0.79)	(-0.80)	(-0.90)	(-0.85)
ROA	0.732*	0.727*	0.728*	-0.294**	-0.294**	-0.294**
	(1.78)	(1.77)	(1.78)	(-1.99)	(-2.00)	(-1.99)
FCF_sale	-0.392	-0.381	-0.387	0.107	0.111	0.108
	(-1.47)	(-1.44)	(-1.46)	(1.32)	(1.37)	(1.33)
leverage	0.348***	0.350***	0.350***	-0.062	-0.062	-0.062
	(2.57)	(2.61)	(2.61)	(-1.26)	(-1.25)	(-1.25)
coverage	-0.0002	-0.0002	-0.0002	0.0001	0.00001	0.0001
	(-1.03)	(-0.99)	(-0.98)	(0.54)	(0.54)	(0.55)
Zscore	0.039*	0.039*	0.038*	0.022***	0.022***	0.022***
	(1.75)	(1.75)	(1.74)	(2.91)	(2.91)	(2.90)
Cons	-0.199	-0.189	-0.192	0.128	0.132	0.131
	(-0.87)	(-0.83)	(-0.85)	(1.06)	(1.09)	(1.08)
N	4901	4901	4901	4901	4901	4901
R^2	0.09	0.10	0.10	0.12	0,12	0.12

This table displays the moderating effect of bank's propensity to hedge on the association between credit derivatives and discretionary accruals for large loan size subsample. I rank all loan observations by the amount of borrowing and assign to small (large) loan group whose loan size are less (greater) than the first (third) quintile of loan size distribution. Two interaction terms, inter_cre_tra and inter_cre_ntr, represent the product of non_cre_TA and trading purpose and non-trading purpose of credit derivatives holding, respectively. All variables are defined in Table 1. All regression analysis include industry and year dummies. In parentheses are t-statistics adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

V. CONCLUSION

Financial innovations have created a lot of changes in financial markets and to the extent stimulate economy activities and facilitate economics growth. However, the rise of financial tsunami in 2008 has reminded all investors the dark side of innovations in financial markets. Researchers have noticed that these innovations

have changed the specialness of banks (Gande & Saunders, 2012). This study intends to investigate one particular issue whether the use of credit derivatives reduce the lending banks involvement in supervision. Previous studies have addressed that credit derivatives forms significant change in the lending banks' operations (Cebenoyan & Strahan, 2004; Hirtle, 2009), while how borrowers responds to the varying credit conditions is less documented. The goal of this study is to conduct the impact of credit derivatives used by lenders on earnings management of borrowers.

This study investigates the governance role of lending banks by examining the borrower's earnings management when credit derivatives are available to banks in managing risks. Using private bank loans from Taiwanese companies from 2007 to 2011, I find the relation between credit derivatives and discretionary accruals is triggered by the size of bank loan and the motive of credit instruments. When the amount of borrowing is large, banks active in credit derivatives transactions for non-trading purpose facilitates less involvement in earnings management of borrowers. Furthermore, my evidence shows that the higher of bank's propensity to hedge the lower discretionary accruals following the use of credit derivative for non-trading purpose. The evidence is consistent with Hirtle (2009) that the use of credit derivatives appears to be complementary to other hedge devices available to banks. I state that banks blend credit derivatives and supervision together in managing risks. The governance role of banks remains significant with the creation of credit derivatives.

This study investigates the variation in borrowing firm's earnings management to gauge the change in lending bank's supervision due to the risk management effect from the holding of credit derivatives. In addition to accruals-based measure, the effectiveness of bank monitoring can be addressed by other channels associated with the reduction in information asymmetry. Previous studies suggest that acquiring private debts helps the borrowing firm to resolve investment inefficiency and alleviate financial constraints (Beatty, Liao, & Weber, 2010; Biddle & Hilary, 2006; Diamond, 1991; Hoshi, Kashyap, & Scharfstein, 1991; Houston & James, 1996). Accordingly, further studies could examine the investment efficiency and the investment-cash flow sensitivity of borrowing firm to verify the side effect of credit derivatives.

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銀行信用衍生性商品交易與公司盈餘管理關係之分析

邱琦倫*

摘要

文獻主張銀行涉入可提升借款者公司治理的品質。依據文獻觀點，本研究探討銀行在衍生性商品交易是否會改變銀行的治理地位。在金融市場信用衍生性商品提供給所有投資人(包含銀行)避險與套利的機會。考量信用衍生性商品風險分擔的功能，投資人質疑銀行在放款中所創造的特殊性是否因為衍生性商品交易而發生變化。本研究以台灣銀行在 2007-2011 年對公司放款為樣本進行分析，研究發現銀行在信用衍生性商品的交易與公司盈餘管理之間的關係並不明確。兩者之攸關性受到放款規模與銀行進行衍生性商品交易的目的主導。研究發現當放款金額愈高時持有非交易性目的的信用衍生性商品可以降低借款公司盈餘管理程度。然而，以交易為名目的信用衍生性商品操作對於管理者操弄並無顯著影響。本研究主張非交易性目的的信用衍生性商品被銀行視為其他避險工具的互補品。

關鍵詞彙：信用衍生性商品，盈餘管理

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