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## Accounting manipulation and loan contract terms

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**Abstract**

**I examine the impact of accounting information frictions on contracting efficiency. More specifically, this paper investigates the relationship between real earnings management and both the structure of syndicated loans and the non-price loan terms. The results suggest that loans to borrowers with higher real earnings management have fewer lenders. In addition, I find that real earnings management is negatively associated with loan maturity and the number of financial covenants. The results point to a necessary trade-off facing borrowers between the benefits of manipulating financial performance and strict contract terms.**

**Keywords: accounting manipulation, loan contracting, syndicated loans.**



## ***1. Introduction***

Debt financing is a crucial part of firms' funding for business operations (Bharath et al., 2008). In 2019, U.S. domiciled corporations raised more than \$1.7 trillion of new external capital. Of that amount, more than 90% was some form of debt financing (i.e., bonds, syndicated debt, or other types of loans); the remaining was in the form of common and preferred equity (Federal Reserve, 2020). Nevertheless, while several studies are investigating how publicly available accounting information influences the equity market, the importance of accounting information in the debt market has attracted comparatively little attention (Beatty et al., 2019). This study focuses on the syndicated loan market where two forms of information asymmetry exist: (1) between borrowers and lenders and (2) among the lenders themselves. I investigate how real earnings management influences syndicated loan structure and (non-price) loan terms.

A typical syndicated loan involves two or more banks jointly providing funds to a borrower (e.g., Ball et al., 2008; Beatty et al., 2019). Due to the complicated nature of the syndicated loan deals, syndicate participants usually delegate a lead arranger to monitor borrowers' efforts to avoid the potential free-riding problem and reduce the costs of repetitive work (Ball et al., 2008). This feature of the syndicated loans may induce information asymmetries not only between borrowers and lenders but also between lead lenders and other participants in a syndicated loan deal. Despite holding only a fraction of the loan, the lead bank manages the loan and is responsible for screening the borrower ex-ante and monitoring the borrower ex-post (Ball, Bushman, and Vasvari 2008). The literature recognizes two incentive problems that arise in this

context (Sufi, 2007). First, *adverse selection problems*, whereby the lead bank may exaggerate loan quality or may syndicate risky loans. Second, *moral hazard problems* may occur whereby the lead bank fails to perform its full monitoring responsibilities after selling parts of the loan to syndicate participants.<sup>1</sup> Consistent with this, prior research shows that syndicated loans to borrowers with high information opaqueness include fewer participants, as syndicates with fewer lenders reduce both free-rider problems in information collection and monitoring (see Dennis and Mullineaux 2000; Qian and Strahan 2007; Sufi 2007; Kim and Song, 2011).

Extant work demonstrates that financial information plays a vital role in resolving adverse selection and moral hazard problems caused by information asymmetries in capital markets (e.g., Akerlof, 1970; Li, 2018). Several papers examine how financial reporting mitigates information asymmetries in debt contracting. A common hypothesis in these papers is that borrowers with high-quality accounting information have better contract terms (e.g., longer loan maturity, lower interest rate, and limited use of collateral) and a lower fraction of the loan held by the lead bank and more participants in the syndicate (Ball et al., 2008; Beatty, 2008; and Bharath et al., 2008). Such a hypothesis is built on the logic that reliable information reduces information asymmetry and improves contracting efficiency. Suppose all participants in syndicated loans have confidence in the firm's future repayment ability by evaluating the financial reporting. In that case, there is neither an extra cost in gathering the borrower's internal information and

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<sup>1</sup>Loan agreements typically limit the lead bank's liability.



enhancing monitoring capacity nor a cost of agency problem between the lead bank and other banks (Ball et al., 2008).

Financial statements represent a credible and low-cost resource of firm-specific information in accounting systems (Ball et al., 2008). Even though financial reporting information, in most cases, has already been predicted by the capital market and reflected in the share prices before the disclosure, stakeholders still do use the reported numbers for contracting purposes (Shivakumar, 2013). However, as a technique to conceal the real performance of firms and mislead stakeholders, earnings management reduces the usefulness of accounting information (e.g., Hadani et al., 2001; and Pappas et al., 2019). This paper investigates whether lenders in syndicated loans can detect and respond to real earnings management and how lenders react to the manipulated accounting figures if they identify real earnings management activities by observing the changes in syndicate structure and loan terms.

This paper predicts that banks, as primary lenders of syndicated loans would price protect themselves against real activities manipulations. To this end, I use fixed effects regressions to verify the relationship between real earnings management and the structure of loans as well as loan terms. Specifically, I use two proxies for the syndicate structure: the number of lenders in a syndicated loan deal and the fraction of loan held by the lead arranger. In addition, I use two non-price terms to measure lenders' response: maturity and the number of financial covenants in a loan. Real earnings management is estimated as in Roychowdhury (2006), which was extended by Irani and Oesch (2016) by quantifying the abnormal levels of reported numbers (e.g., operating cash flows and discretionary expenditures). Using loans issued to U.S firms from 1996

to 2017 from DEALSCAN and accounting information from COMPUSTAT, this paper finds that loans to borrowers with higher real earnings management have fewer lenders. Moreover, real earnings management is negatively related to loan maturity and the number of financial covenants.

This study also contributes to the literature studying the adverse effects of misreporting on loan contracts. Firms have many incentives to conduct real earnings management, such as affecting share prices to overvalued in IPOs and SEOs period (Cohen and Zarowin, 2010; and Kothari, Mizik, and Roychowdhury, 2015), reaching specific earnings benchmarks (Roychowdhury, 2006), and meeting contract terms or targets relating with reporting figures (Bartov, 1993). However, according to the findings in this paper, firms' practices of real earnings management are detected and priced by lenders. Consequently, although real earnings management draws less attention from regulators than other earnings manipulation methods, firms have to consider carefully the trade-off between the incentives to engage in real earnings management and the strict contracting terms.

The rest of the paper proceeds as follows. The relevant literature review and hypotheses in Section 2, research sample and methodology in Section 3, empirical results in Section 4, discussion of distribution and limitation in Section 5, and conclusion in Section 6.

## *2. Literature review and hypotheses*

### **2.1 Relationship between debtholder, shareholder, and manager**

Longstanding research in financial economics argues that conflicts between shareholders and debt holders can be principally attributable



to their different firm expectations. Shivakumar (2013) argues that, at the heart of this research, shareholders seek to maximize the firm's value by sacrificing the benefits of debtholders. Therefore, as the firm owners, shareholders have incentives to invest in high-risk projects or tend to underinvest and pass up positive net present value projects when the company approaches default. This is due to the fact that shareholders enjoy all upside payoffs and share losses with debtholders from high-risk projects. Armstrong illustrate) illustrates some shareholders' actions to transfer the wealth from debtholders to themselves. These actions include increasing dividend payments and increasing future debt levels. This often leads to a reduction of the available resources for debtholders and, thus, reduces the probability of debt repayments. Accordingly, Armstrong et al. (2010) indicate that lenders who are the outside capital providers need information to anticipate the possibility of such detrimental behaviors of shareholders/managers and take actions to restrict them from engaging in adverse activities to protect themselves.

## 2.2 Accounting information quality and syndicated loan structure

Holmstrom (1982) and Diamond (1984) state that syndicated loans involve delegating one lead lender to carry out due diligence on the borrower before making contracts and monitor the borrower's activities after the loan deal is made. Lead arrangers may not share appropriate information with other participants or may reduce his – unobservable- monitoring efforts. Those types of information asymmetries elicit both moral hazard and adverse selection problems among lenders in the syndicated loans (Ball et al., 2008). Lead lenders may *ex ante* process private information gathering via the exclusive

relationship with the borrower and unknown by other participants to achieve private benefits. For example, lead lenders may access the borrower's inside information to distinguish various qualities of loans and keep a large proportion of high-quality loans, then sell most low-quality loans to other syndicate participants who do not have sufficient information (Ball et al., 2008).

Dennis and Mullineau (2000) and Sufi (2007) argue that lead lenders will be required to monitor less transparent borrowers intensively, especially when there are concerns about the borrower's accounting characteristics. This, in turn, increases the demand that lead lenders to retain a more significant proportion of the syndicated loan to elicit better monitoring. Ball et al. (2008) find that the high debt-contracting value of borrowers' accounting information (i.e., the ability of accounting information to predict downside risk) enables participants of the syndicated loan - without privileged relationship - to effectively assess the borrower's credit quality and reduce information asymmetries among lenders. They find that when the borrower's financial statements can provide a more informative signal about future credit quality, the lead lender would hold a smaller proportion of the overall loan deal and the ownership structure of the syndicated loan is less concentrated.

### **2.3 Accounting information quality and debt contract terms**

A key stylized fact from prior research is that firms with lower quality of accounting information face stricter conditions in syndicated debt contracts, such as significantly higher interest rates, shorter maturity, and more likely to provide collateral. Bharath et al. (2008) state that bondholders focus primarily on price terms when facing the uncertainty





of the firm's future repayment in the public debt market. However, private lenders/banks have more flexibility in contracting and *ex-post* renegotiation by using price and non-price terms when the new information arrives. That's why borrowers with poor-quality accounting information prefer to choose private debt with strict non-price terms to avoid adverse selection problems. They find that a 14 basis points difference of interest spreads in private debt, compared to a 29 basis points difference in the case of public debt when the accounting quality move from the lowest to the highest quintiles.

Bharath et al. (2008) find that accounting quality is associated with favorable non-price terms (longer maturity and lower collateral). Consistent with other prior literature, they argue that stricter contract terms for firms with lower quality information reflect lenders' compensation for the risk. Similarly, Graham et al. (2008) state that banks' reactions to firms' accounting information can be expressly observed through loan contract terms. They argue that to overcome risks and problems from insufficient and unreliable information disclosure, banks claim higher upfront and annual fees, cut down the number of lenders in each of loan deals, and offer tighter contract terms, including more covenant restrictions for the firms with low-quality information, especially for restating or even fraudulent restating borrowers.

Regarding the number of financial covenants in a syndicated loan deal, it is controversial whether private lenders require more covenants to constrain borrowers with poor accounting quality or not. Some scholars (e.g., Smith and Warner, 1979; Graham et al., 2008; and Pappas et al., 2019) argue that intensive financial covenants are helpful to mitigate the

agency problems between borrowers and lenders, and lead lenders can timely recognize bad news and then timely transfer control rights or renegotiate further loan terms and, therefore, more tight covenants would be required from firms with poor-quality financial reporting. However, prior studies document that firms have motivations to conduct earnings management, especially real earnings management, to avoid violations of covenants. Consistent with this, Costello and Wittenberg-Moerman (2010) argue that covenants are less efficient in delivering information about borrowers' creditworthiness changes. Specifically, they argue that lenders are expected to use fewer financial covenants as a tool of *ex-post* monitoring when the borrower's financial reporting is subject to an internal control weakness (Costello and Wittenberg-Moerman, 2010).

#### **2.4 Earnings management and accounting information quality**

According to the evidence found by Ball and Shivakumar (2008), earnings announcements, one of the most crucial firm-specific information, contain little timely new information for investors and other capital market participants. This is consistent with Beaver's (1968) and Ball and Brown's (1968) findings that other information sources capture the contents in annual income statements disclosed earlier. Accordingly, the reported earnings have a role that is different from providing new (valuation) information, like reducing agency costs in designing debt and compensation contracts (Armstrong et al., 2010; Shivakumar, 2013).

Accounting information is an important element in debt contracting. It assists lenders in assessing the borrower firm's creditworthiness and as a performance measure in contract terms (e.g., debt covenants and



performance pricing provisions) (Pappas et al. 2019). However, it is well demonstrated that managers have numerous incentives to take legitimate and less legitimate actions whereby changing in accounting policies or real actions to manipulate the reported numbers and, thereby, reduce the usefulness of accounting numbers as a monitoring mechanism (Pappas et al., 2019). Hadani et al. (2001) also argue that earnings management adversely affects the quality of earnings in financial reporting, exacerbating the information asymmetries.

Earnings management is an opportunistic behavior typically undertaken by a firm's manager to manipulate and conceal the real performance to obtain favorable contract terms (Healy and Wahlen 1999). Hill et al. (2019) illustrate that managers can use accruals-based or real earnings management strategies (or both as complements) to smooth earnings or achieve some specific reported earnings objective. However, this paper only focuses on the influence of real earning management in the debt contracts because substantial surveys indicate that managers more pervasively manipulate earnings via real earnings management than via accruals-based earnings management (e.g., Cohen et al., 2008; Cohen and Zarowin, 2010; and Zang, 2012), and test whether debt providers in syndicated loans can detect the real earnings management and how lenders react to the borrowers' real earnings management activities.

Roychowdhury (2006) explains why financial executives are more willing to manipulate earnings through real activities rather than accruals-based strategies. In particular, he argues that accrual manipulation is more likely to attract auditor or regulator observation about pricing and production than real manipulation. Real activities

manipulation is defined by Roychowdhury (2006) as management actions that depart from standard practices of business. Those activities can be price discounts to temporarily increase sales, overproduction to lower the cost of goods sold, and reduction of discretionary expenditure to aggressively improve margins. Roychowdhury argues) argues that even though these activities enable managers to meet short-run earnings targets, they are unlikely to enhance firm value in the long run and can negatively affect revenue in future periods, which can be explained as follows. To meet some short-term earnings targets, firms can adopt aggressive price discounts to enhance sale volumes, leading customers to expect such discounts in future periods. This can imply potentially lower margins on future sales. Overproduction generates excess inventories that must be sold in subsequent periods, which takes the pressure of future selling and increases inventory holding costs. To save current cash outflows, firms could reduce investment in discretionary expenditures (R&D, advertising, and maintenance) which might impede the firm's development of new products and improving existing products in the future, thereby causing the firm to lose market share to its competitors. Borrowers' future cash flows enable lenders to collect their interest payments and recover their initially invested capitals and, therefore, lenders should be particularly concerned with real manipulation that negatively affects the firm's future cash flows (Pappas et al., 2019).

## **2.5 Real earnings management and syndicated loan**

It is widely recognized that earnings management strategies may hurt a firm's long-term performance (e.g., Hill et al., 2019). Kim et al. (2018) suggest that equity investors in the capital market account for the



negative impact of real earnings management in their prediction of the firm's future performance. This could lead to a positive association between the cost of equity capital and the extent of real earnings management (Kim and Sohn, 2013).

However, Kim et al. (2018) argue that it is difficult to assert whether or not the real earnings management is priced appropriately by debt investors due to prior mixed empirical evidence. It is costly for lenders to process complex information of a borrower's operating system and then judge whether the firm performs suboptimal business practices to manipulate earnings on purpose. Lenders may not interpret some actions, such as the aggressive cut of discretionary expenditures, as cost-saving (Pappas et al., 2019). Furthermore, lenders also rely on external monitoring forces to detect real earnings manipulation, but not all forms of real earnings management can draw auditors' and regulators' scrutiny (Roychowdhury, 2006).

On the other hand, Pappas et al. (2019) state that although real earnings management is particularly hard for outsiders to detect, banks are complex enough to identify and penalize firms' earnings management. They argue that it is a lengthy process of initiating a syndicated loan involving intensive communication between a lead lender and the potential borrower. In this process, banks gain private information about a borrower by conducting due diligence through their privileged relationship with the borrower and learning from previous experience monitoring this borrower or peer firms (e.g., Diamond, 1984; Ball et al., 2008; and Bharath et al., 2008). The lead lenders may require some internal information, such as monthly financial reports and projects' specific cash flow statements, to assist them in evaluating the quality of

the borrower's accounting information (Pappas et al., 2019). Even after initiating a syndicated loan, the lead lender, as a delegated monitor, can still collect private information through the monitoring progress (Diamond, 1984).

Real earnings management increases both information and default risk, as outlined above. Thus, if lenders realize the existence of real manipulation of earnings in a borrower's financial reporting, they are expected to respond with stricter loan contract terms (such as higher interest rates and shorter maturity). The syndicate structure is also expected to adjust (such as a larger fraction of the loan held by a lead arranger and fewer numbers of lenders in a loan deal). The hypotheses can be put forward as follows:

*H1: The syndicate size is negatively associated with the extent of real earnings management.*

*H2: The part of the loan amount retained by the lead lender is positively associated with the extent of real earnings management.*

*H3: The loan's maturity in the debt contract reacts negatively to the level of real earnings management.*

*H4: The number of covenants in the loan has a negative relation with the extent of real earnings management.*

### **3. Research design**

#### **3.1 Data**

The starting sample includes all publicly traded nonfinancial US firms with syndicated loan data in the Dealscan database. Loans from Dealscan are then merged to Compustat/CRSP data using the Roberts



Dealscan–Compustat link (see Chava and Roberts, 2008). Due to the low coverage of Dealscan before 1995 (Chava and Roberts, 2008), the sample is restricted to the period between 1996 and 2017. All sole lender deals and borrowers from financial industries (SIC code 6000-6999) are removed from the final dataset.<sup>2</sup> Furthermore, the extreme values of all continuous unlogged variables are winsorized at the 1st and 99th percentiles.

### 3.2 Proxies for real earnings management

To estimate the magnitude of real earnings management, I follow Irani and Oesch (2016). Following prior literature, this paper considers the abnormal levels of operating cash flows (CFO) and discretionary expenditures (DIS.EXP) as estimation of real earnings management (REM) activities, namely achieving sales manipulation by higher price discounts or more favorable credit terms accelerating the timing of sales and temporarily boosting the sale volumes; cutting discretionary expenditures by reduction of R&D, advertising costs, and selling, general and administrative expenses (SG&A) (Irani and Oesch, 2016; Pappas et al., 2019). Those two proxies are likely to deviate from the normal level of similar firms (in the same industry and same year) if the firm tries to hide the real performance using REM.

Specifically, based on Pappas et al.'s (2019) arguments, from the sales manipulation aspect, more lenient credit terms or deeper price discounts will reduce sale margins shown by the abnormally low cash inflows accompanying high production costs relative to sale volumes.

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<sup>2</sup> I require that all relevant accounting data be available in the year before the initiation of syndicated loans.

Otherwise, from the costs manipulation aspect, on the one hand, to reduce the discretionary expenditures, the abnormally low level of investment in R&D, advertising, and SG&A activities generally paid in cash will be observable, leading to lower cash outflows, thus promoting the current CFO. On the other hand, increasing the production exceeding the necessary level for spreading fixed overhead costs over a large number of production units will decrease the fixed costs per unit and then reduce the COGS (although smaller fixed costs per unit will not offset the increase in the variable costs per unit), which results in abnormally vast costs of production and abnormally low CFOs relating with sale volumes.

To measure the abnormal level of CFO and DIS.EXP, the normal levels of these proxies, each industry and year, need to be generated first. Linear regression will be used where the error terms will indicate the abnormal levels of the proxies. The cross-sectional regression used to estimate normal CFO expressed as follows:

$$\frac{CFO_{i,t}}{ASSET_{i,t-1}} = a_1 \frac{1}{ASSET_{i,t-1}} + a_2 \frac{SALES_{i,t}}{ASSET_{i,t-1}} + a_3 \frac{\Delta SALES_{i,t}}{ASSET_{i,t-1}} + \varepsilon_{i,t} \quad (1)$$

where  $CFO_{i,t}$  is the firm i's cash flow from the operations in period t.  $ASSET_{i,t-1}$  is firm i's total assets at the end of period t-1;  $SALES_{i,t}$  is firm i's sales revenue during the period t;  $\Delta SALES_{i,t}$  is the change of revenue of firm i from period t-1 to t, and  $\varepsilon_{i,t}$  is the residual term. Abnormal CFO ( $RM_{CFO}$ ) is computed as the difference between actual CFO and normal level of CFO from equation (1). I multiply  $RM_{CFO}$  by -1 so that a higher value of  $-RM_{CFO}$  implies a greater extent of REM.

To estimate normal discretionary expenditures, the following equations is estimated:





$$\frac{\Delta DIS.EXP_{i,t}}{ASSET_{i,t-1}} = b_1 \frac{1}{ASSET_{i,t-1}} + b_2 \frac{SALES_{i,t-1}}{ASSET_{i,t-1}} + \varepsilon_{i,t} \quad (2)$$

where  $DIS.EXP_{i,t}$  represents firm  $i$ 's discretionary expenditures in period  $t$ , defined as sum of R&D expenses, advertising expenses and SG&A expenses.  $SALES_{i,t-1}$  is the sales revenue of firm  $i$  at the end of period  $t-1$ . Other variables are defined as same as variables in equation (1). Abnormal discretionary expenditures ( $RM_{DIS.EXP}$ ) are actual values minus the expected values from the equation (2). I also do multiply  $RM_{DIS.EXP}$  by -1 for straightforwardly perceiving greater extent of REM by higher value of  $-RM_{DIS.EXP}$ .

Those two measures ( $RM_{CFO}$  and  $RM_{DIS.EXP}$ ) are then used to capture real earnings management activities as suggested by Irani and Oesch (2016):

$$RM = -RM_{CFO} - RM_{DIS.EXP}. \quad (3)$$

Higher values of  $RM$  mean that firms are more prone to use real activities to manipulate the financial figures. This study applies  $RM$  to evaluate the extent of real earnings management and explore the relationship between real earnings management and syndicated loan deals' ownership and loan terms.

### 3.3 Control variables

In order to alleviate concerns regarding the influence of other firm-specific factors on the observed relationship, I include some firm-specific control variables in the model. Following previous papers, I focus on three main control variables in my baseline results: firm's size measured as the natural logarithm of the firm's total assets ( $\log(at)$ ), firm's profitability ( $prof$ ) measured as ROA (i.e., net incomes divided by total assets), and firm's leverage ( $lev$ ) level measured as total

liabilities to total assets. In section 4.3, I include additional control variables to check the robustness of the results.

### 3.4 Empirical strategy

Empirical tests of how REM affects the ownership structure of a debt contract and a debt contract's terms are estimated by OLS regressions with fixed effects:

$$NumLenders_{i,t} \quad (4)$$

$$= f_1 + f_2RM_{i,t} + f_3\log(at)_{i,t} + f_4lev_{i,t} \\ + f_5prof_{i,t} + industry\ FE + Year\ FE + \varepsilon_{i,t}$$

$$MeanShare_{i,t} \quad (5)$$

$$= g_1 + g_2RM_{i,t} + g_3\log(at)_{i,t} + g_4lev_{i,t} \\ + g_5prof_{i,t} + industry\ FE + Year\ FE + \varepsilon_{i,t}$$

$$Maturity_{i,t} = j_1 + j_2RM_{i,t} + j_3\log(at)_{i,t} + j_4lev_{i,t} \quad (6)$$

$$+ j_5prof_{i,t} + industry\ FE + Year\ FE + \varepsilon_{i,t}$$

$$NumCov_{i,t} = h_1 + h_2RM_{i,t} + h_3\log(at)_{i,t} + h_4lev_{i,t} \quad (7)$$

$$+ h_5prof_{i,t} + industry\ FE + Year\ FE + \varepsilon_{i,t}$$

$RM_{i,t}$  in four regressions represents the level of REM for firm  $i$  in time  $t$ .  $f_1$ ,  $g_1$ ,  $j_1$  and  $h_1$  are intercept terms in each regressions.  $f_2$ ,  $g_2$ ,  $j_2$  and  $h_2$  are the coefficient of test variable  $RM_{i,t}$  in each regressions respectively. All models include year and industry fixed effect (two-digit sic code) to control for time trend and heterogeneity across industries. Regressions above are estimated for investigating the association between the magnitude of REM and the designing of debt contracts, which can verify whether lenders can detect firms' REM practices and then respond in debt contracts. Therefore, I identify four dependent variables with two proxies of syndicate structure and two types of loan terms chosen to examine the relationship with REM with the other three control variables.



The first dependent variable in equation (4) is the number of lenders (*NumLenders*) in a syndicated loan deal, it is expected, according to H1, to be negatively associated with *RM*. The dependent variable in Equation (5) is the fraction of loan retained by the lead arranger (*MeanShare*) which is predicted to be larger with the greater *RM*. The main reason for this according to H2, is to incentivize the lead leader to monitor the borrower's business and thus ensure the redeemability. Third, the maturity term of a loan (*Maturity*) in the equation (6) which is expected to be shorter with the greater *RM*, so that the coefficient of *RM* is predicted to be negative. Lenders propose harsher loan terms like shorter maturities for facilitating prompt re-evaluations of the borrower's credit quality and renegotiations of contract terms on a timely fashion (Pappas et al., 2019). The number of financial covenants (*NumCov*) is expected to smaller due to the lenders' less reliance on covenants for monitoring when the accounting quality decrease.

#### 4. Empirical results

##### 4.1 Descriptive statistics and correlation analysis

Table 1 shows descriptive statistics for the test sample, including summary statistics for real earnings management variable (*RM*), control variables (*log(at)*, *prof* and *lev*) and outcome variables (*NumLender*, *MeanShare*, *Maturity* and *NumCov*). The mean (median) values of *RM* is -0.092 (-0.014), which is generally comparable to those *RM* figures documented in prior research. With respect to control variables, the distribution of firm size, leverage and profitability of borrower firms has mean (median) values of 7.203 (7.243), 0.637 (0.627) and 0.007 (0.032) respectively. This means that, on average, the sample borrower firms' total liabilities occupy 63.7% of their total

assets and they average ROA of 0.7%. In terms of loan variables, mean (median) number of lenders and portion of lead lenders' ownership are 7.611 (5) and 34.098 (20) respectively. On average, seven to eight lenders fund a loan deal and a lead lender in a loan holds around 34% of the loan. The mean (median) maturity is 45.613 (51) months and the mean (median) of number of covenants is 2.445 (2). Therefore, the average length of maturity of debt contracts in samples is 45 to 46 months and each debt contract contains about two financial covenants.

Table 1. Summary Statistics

Variables	N	Mean	Std. Dev.	25%	Median	75%
<i>RM</i>	24,656	-0.092	3.170	-0.180	-0.014	0.114
<b><u>Control Variables</u></b>						
<i>ln(SIZE)</i>	24,656	7.203	1.983	5.892	7.243	8.582
<i>lev</i>	24,627	0.637	0.247	0.485	0.627	0.754
<i>prof</i>	24,656	0.007	0.139	-0.004	0.032	0.065
<b><u>Loan Variables</u></b>						
<i>No.Lender</i>	24,656	7.611	7.256	2.000	5.000	10.000
<i>Lead.Own</i>	7,502	34.098	31.389	11.333	20.000	47.667
<i>Maturity (month)</i>	24,656	45.613	22.524	26.000	51.000	60.000
<i>NumCov</i>	15,606	2.445	1.111	2.000	2.000	3.000

Notes: Our sample contains 24,656 loans issued to 7,165 U.S. public firms from 1996 to 2017. Definitions of variables refer to Appendix.

Table 2 reports Pearson correlation matrix among variables in tests across this study. *RM* is significantly negatively correlated with the dependent variable of the number of covenants (*NumCov*) in 1% significance level. It provides a preliminary support for hypothesis *H4* of that greater level of real earnings management leads to less use of financial covenants. The correlation between *RM* and Maturity is negative, which is inconsistent with the prediction of *H3*, but this correlation is insignificant. On the contrary, the positive correlation between number of lenders and *RM*, and the negative correlation between fraction of the lead lender's ownership and *RM* both against



the expectation in *H1* and *H2*. These later correlations are not significant and it is important to note that some potential omitted-variable problems may not be addressed in the univariate correlation analysis. In order to supply more accurate evidence about the relations between real earnings management and features of debt contracts, multivariate analyses are implemented in the next section.

**Table 2. Correlation matrix**

	1	2	3	4	5	6	7	8
1 <i>RM</i>								
2 <i>NumLende</i>	0.0158							
3 <i>MeanSha</i>	-0.0081	-						
4 <i>Maturity</i>	-0.0014	0.1272	-					
5 <i>NumCov</i>	0.0462	0.1574	0.2124	0.0653				
6 <i>log(at)</i>	0.0524	0.5209	0.6864	0.1064	-			
7 <i>lev</i>	0.0350	0.0961	0.1644	0.0980	0.0444	0.1588		
8 <i>prof</i>	0.0434	0.1422	0.2574	0.1122	0.0134	0.2579	-	0.2537

Notes: This table exhibits the Pearson product-moment correlation coefficients among the main variables used in tests. Definitions of variables refer to Appendix. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels respectively (two-tailed).

#### 4.2 The effect of real earnings management on loan characteristics

Table 3 presents the empirical evidence of the influence of real earnings management on syndicated debt contracts using regression equations (4) to (7). Panel A shows estimation results of the relationships between

real earnings management (*RM*) and the ownership structure of syndicated loans (*NumLenders* and *MeanShare*). Panel B displays the regressions results for the impact of real earnings management on non-price loan terms (*Maturity* and *NumCov*).

#### 4.2.1 Number of lenders

Table 3 Panel A shows the results of equation (4). The results show that the level of real earnings management is negatively associated with the number of lenders in a syndicated loan deal (coefficient = -0.025, t-statistic = -2.12). The negative sign of the coefficient is consistent with *H1* that the number of lenders (*NumLenders*) is negatively associated with real earnings manipulation activities. For control variables, larger firms, firms with higher leverage, and firms with higher ROA predictably have greater number of lenders in their syndicated loans.

#### 4.2.2 Fraction of loan retained by the lead lender

Table 3 Panel A shows the results of equation (5). The results show a positive relation between fraction of lead lenders' loan ownership (*MeanShare*) and real earnings management (coefficient = 0.132, t-statistic = 1.48). Even though this coefficient does not reach conventional levels of significance, it still supports the prediction of hypothesis *H2*.

With respect to control variables, the result indicates that the fraction of loan retained by the lead lender is negatively associated with firm size (coefficient = -9.676, t-statistic = -36.62), negatively associated with leverage (coefficient = -9.557, t-statistic = -5.52), and negatively associated with ROA (coefficient = -21.976, t-statistic = -8.10).



#### 4.2.3 Maturity

Table 3 Panel B shows the results of equation (6) that examines the relation between the loan maturity and real earnings management. The coefficient on *RM* is negative and statistically significant (coefficient= -0.094, t-statistic = -2.03) suggesting a negative association between *Maturity* and *RM*. This empirical result is consistent with *H3*. Regarding to control variables, the coefficient on firm size (*log(at)*) is negative (coefficient = -0.056, t-statistic = -0.38). Furthermore, coefficients on leverage (*lev*) and profitability (*prof*) are positive and statistically significant (coefficient = 9.492 and 15.208, t-statistic = 11.30 and 12.80 respectively).

#### 4.2.4 Number of covenants

Table 3 Panel B reports the effects of real earnings management on the number of financial covenants (equation 7). As shown in the table, the coefficient on *RM* is significantly negative (coefficient= -0.006, t-statistic= -2.17). Therefore, the number of covenants is negatively associated with the level of real earnings management, consistent with the idea that lenders abstain from using financial covenants when the borrower's financial information quality is subject to manipulation. This finding supports hypothesis *H4*.

With regard to the control variables, financial covenants are negatively associated with firm size (coefficient = -0.143, t-statistic = -14.93 of *log(at)*) positively associated with leverage (coefficient = 0.095, t-statistic = 1.91 of *lev*) and positively associated with ROA (coefficient =0.643, t-statistic =7.54 of *prof*).

**Table 3. Real earnings management and debt contracts (ownership structure and loan terms)****Panel A: REM and ownership structure of loan deals**

Independent Variables \ Dependent Variables	<i>NumLenders</i>	<i>MeanShare</i>
<i>RM</i>	-0.025** (-2.12)	0.132 (1.48)
<i>log(at)</i>	2.085*** (41.34)	-9.676*** (-36.62)
<i>lev</i>	0.493** (2.03)	-9.557*** (-5.52)
<i>prof</i>	0.284 (0.94)	-21.976*** (-8.10)
Intercept	-6.4664*** (-6.91)	123.368*** (17.44)
Industry Effects	Included	Included
Year Effects	Included	Included
No. of Observations	24,612	7,489
$R^2$	0.2995	0.5174
Adjusted $R^2$	0.2972	0.5123
F	41.78	58.69

**Panel B: REM and loan terms**

Independent Variables \ Dependent Variables	<i>Maturity</i>	<i>NumCov</i>
<i>RM</i>	-0.094** (-2.03)	-0.006** (-2.17)
<i>log(at)</i>	-0.056 (-0.38)	-0.143*** (-14.93)
<i>lev</i>	9.492*** (11.30)	0.095* (1.91)
<i>prof</i>	15.208*** (12.80)	0.643*** (7.54)
Intercept	38.279*** (12.08)	4.021*** (22.60)
Industry Effects	Included	Included
Year Effects	Included	Included
No. of Observations	24,612	15,580
$R^2$	0.1947	0.2317
Adjusted $R^2$	0.1921	0.2278
F	52.68	37.86





*Notes: This table exhibits regressions' results for the influence of REM on loan ownership structure and loan contract terms, including number of lenders, portion of lead lenders' ownership, interest spreads and maturity. All loan variables are figured at the initiation of a loan and all firm variables are calculated at the end of each fiscal year before the loan initiation. T-statistics in parentheses are clustered at firm level by year and estimated by standard errors corrected for heteroscedasticity. The extreme values of all continuous non-logged variables are winsorized at the 1% and 99% levels. Definitions of variables are presented in Appendix. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels respectively (two-tailed).*

### 4.3 Robustness

One concern with the previously reported results is that loan terms are simultaneously determined and, therefore, loan terms could be a function of other loan terms as lenders are expected to trade-off different terms. Table 4 shows the results of controlling for additional loan-specific variables in equations (4) to (7). More specifically, loan-specific variables are added to our regression results:  $\log(\text{LoanAmount})$  measured as the natural logarithm of loan amount and  $\log(\text{LoanPrice})$  measured as the natural logarithm of loan spread. Therefore, I examine how the documented relationship change after adding two loan-specific control variables. The results in Table 4 show that all coefficients of *RM* are keep the same sign and significant level as prior in the Table 3.

**Table 4. Robustness**

Panel A: REM and ownership structure of loan deals

Independent Variables \ Dependent Variables	<i>NumLenders</i>	<i>MeanShare</i>
<i>RM</i>	-0.022** (-2.02)	0.093 (1.13)
$\log(at)$	0.263*** (5.91)	0.004 (0.01)
<i>lev</i>	-0.720*** (3.47)	-3.009** (-2.10)
<i>prof</i>	-1.645*** (-6.18)	-12.367 *** (-5.60)
$\log(\text{LoanAmount})$	2.716***	-14.019***

	(45.61)	(-36.26)
<i>log(LoanPrice)</i>	-0.515***	1.544***
	(-5.32)	(2.83)
Intercept	-40.798***	304.201***
	(-29.26)	(35.51)
Industry Effects	Included	Included
Year Effects	Included	Included
No. of Observations	24,612	7,489
R2	0.416	0.650
Adjusted R2	0.414	0.646
F	71.79	118.33

**Panel B: REM and loan terms**

Independent Variables \ Dependent Variables	<i>Maturity</i>	<i>NumCov</i>
<i>RM</i>	-0.089**	-0.006**
	(-2.04)	(-2.04)
<i>log(at)</i>	-1.884***	-0.162***
	(-8.62)	(-12.29)
<i>lev</i>	1.835**	-0.272***
	(2.29)	(-5.49)
<i>prof</i>	17.218***	0.895***
	(14.69)	(10.63)
<i>log(LoanAmount)</i>	5.194***	0.144***
	(21.31)	(10.80)
<i>log(LoanPrice)</i>	6.765***	0.420***
	(20.90)	(21.70)
Intercept	-73.738***	-0.399
	(-14.89)	(-1.43)
Industry Effects	Included	Included
Year Effects	Included	Included
No. of Observations	24,612	15,580
R2	0.259	0.282
Adjusted R2	0.257	0.279
F	74.63	48.93

*Notes: This table exhibits tests of robustness of regressions' results for the influence of REM on loan ownership structure and loan contract terms by appending the natural logarithm of loan amount and the natural logarithm of loans' interest spreads as two control variables. All loan variables are figured at the initiation of a loan and all firm variables are calculated at the end of each fiscal year before the loan initiation. T-statistics in parentheses are clustered at firm level by year and estimated by standard*



*errors corrected for heteroscedasticity. The extreme values of all continuous non-logged variables are winsorized at the 1% and 99% levels. Definitions of variables are presented in Appendix. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels respectively (two-tailed).*

## **5 Conclusion**

**This study examines the association between real earnings management and syndicated loans structure and loan terms. More specifically, this paper examines the impact of real earnings management on the number of participants in the syndicate, the fraction of the lead lender's ownership, maturity, and the number of financial covenants. The results show that real earnings management positively relates to the fraction of lead lenders' ownership and negatively relates to the number of lenders, maturity, and the number of covenants. Four regressions are robust. The findings thus can be inferred that banks have superior information accessing and processing ability to eliminate the information asymmetries between borrowers and lenders, and banks react to real earnings management as detrimental to their future repayments with stricter loan terms, less number of lenders, and larger fraction of lead lenders' ownership.**

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