Real Earnings Management, Loan Interest Rates, and Performance Pricing Provisions

Alice-Liang Xu
Alliance Manchester Business School
University of Manchester
Manchester, UK
liang.xu@mbs.ac.uk

Eamonn Walsh
Michael Smurfit Business School
University College Dublin
Dublin, Ireland
eamonn.walsh@ucd.ie

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Abstract

We examine the consequences of real earnings management (REM) for the costs of borrowing in the syndicated loan market. Our findings are consistent with lenders being able to uncover and penalise REM by charging higher interest rates. We then seek to disentangle the potential explanations for a positive relationship by using performance pricing provisions (PPP) in loan contracts since these provisions may be couched in terms of externally determined credit rating or accounting ratios. Ball et al. (2008) and Costello and Wittenberg-Moerman (2011) argue that lenders prefer contracting on credit ratings if they believe the borrower's accounting numbers are of poor quality. On the other hand, they prefer contracting on accounting ratios if the borrower exhibits high default risk. We document that REM increases the likelihood that a PPP is contracted upon accounting ratios, consistent with lenders being more concerned with the incremental default risk induced by REM rather than information risk.

Keywords: Real Earnings Management, Syndicated Loan, Interest Rate, Performance Pricing Provision

1. Introduction

Accounting earnings are important components of debt contracts. They play both an informational role to assist lenders' assessments of the firm's creditworthiness and a contracting role whereby accounting numbers are used as a performance measure in contract terms (e.g., debt covenants and performance pricing provisions). However, it is well known that managers have incentives to manipulate earnings numbers (e.g., DeAngelo, 1986; Dechow, Sloan and Sweeney, 1996; Teoh, Welch and Wong, 1998a, b; Dechow and Skinner, 2000; Efendi, Srivastava and Swanson, 2007). Earnings management obscures the true performance of the firm and impairs the usefulness of accounting numbers as an evaluation and monitoring tool. Therefore, lenders are likely to seek to identify and penalise signs of earnings management. For example, Francis et al. (2005) show that firms with poorer accruals quality report higher interest costs in their financial statements; Bharath et al. (2008) find that poorer accruals quality is associated with higher interest spreads, shorter maturity and a higher likelihood of posting a collateral requirement. These papers focus on accrual-based earnings management (AEM). However, managers can distort the bottom line not only through exerting discretion over accruals, but also via adjusting the timing and structuring of real economic activities. The latter phenomenon has been described as real earnings management (REM). There is limited evidence on whether lenders are able to detect and how they respond to this type of earnings management. To fill this void in literature, we investigate the impact of REM on the pricing of syndicated loans.

The extant literature has disputed the economic implications of REM. The conventional view (Bushee, 1998; Bens, Nagar and Wong, 2002; Roychowdhury,2006; Bhojraj, Hribar, Picconi and McInnis, 2009; Osma and Young, 2009; Cohen and Zarowin, 2010) holds that REM not only increases a firm's information risk but also has a real impact on its default risk as REM impairs future cash flows and long-term firm value. Based on this argument, lenders should punish REM and impose higher interest rates on loans issued to firms engaging in REM. Conversely, a highly cited paper by Gunny

(2010) proposes that REM signals superior future firm performance and she documents empirical evidence in support of this argument. According to Gunny (2010), lenders should reward REM and offer more favourable interest rates to firms engaging in REM. Alternatively, lenders may neither punish nor reward REM since REM is hard to detect for outsiders (Graham, Harvey and Rajgopal, 2005; Roychowdhury, 2006; Cohen, Dey and Lys, 2008; Bartov and Cohen, 2009; Zang, 2011). Lenders are unlikely to respond to REM if they cannot detect it. As a result of these competing arguments, the relation between REM and interest rates is ultimately an empirical question.

Using a sample of 12,277 loans issued to 2,588 U.S. public companies initiated during the period Jan 1996 – June 2012, we document that lenders charge higher interest rates on firms with lower abnormal cash flows and lower abnormal discretionary expenditures. For manufacturing firms, they also incur higher interest rates if they are subject to higher abnormal production costs. These results imply that lenders view REM activities as value-destroying and they impose higher interest rates on firms in order to compensate for the incremental default risk and information risk induced by the borrowers' REM activities. We also find that the impact of REM on interest rates becomes more pronounced as the leverage ratio of the borrower increases.

Our initial results consistently show that lenders penalise borrowers' REM activities. However, these findings do not indicate whether lenders penalise REM because they are concerned about the adverse effect of REM on firms' future cash flows and long-term firm value or because REM biases earnings number and disguises the true performance of the firm. Both default risk and information risk may lead to a higher interest spread. Loan contract conditions relating to performance pricing provisions (PPP) offer a unique opportunity to disentangle these alternative explanations.

A PPP changes interest spreads from static to dynamic. With PPPs, interest spreads can move after loan issuance according to the changes in a pre-agreed measure of borrower performance. This performance measure is usually either accounting ratios or credit ratings, creating a trade-off between the timeliness and the reliability of the performance measure with respect to credit quality

(Ball et al., 2008; Costello and Wittenberg-Moerman, 2011). It is argued that lenders are likely to displace more timely accounting ratios with more reliable credit ratings when the borrower's accounting numbers are of poor quality. On the other hand, when the borrower is subject to high default risk, lenders may prefer accounting-ratio based PPPs. Timely adjustments to interest spreads for firms with higher default risk are likely to be more straightforward. In addition, credit ratings may be less reliable in highly uncertain environments. Since information risk and default risk drive the relation between REM and the PPP metric choice in opposite directions, it should be possible to distinguish between information risk and default risk as potential explanations. Our findings support the default risk explanation. We document that lenders are more likely to adopt accounting-ratio based PPPs when the borrower engages in REM.

This paper contributes to the syndicated loan literature by providing novel evidence on how REM affects the pricing of syndicated loans. Prior studies on the relation between earnings management and syndicated loans mainly focus on AEM. However, managers may exert discretion over accounting earnings not only by manipulating accruals but also by altering the timing and structuring of real economic activities. A number of studies (Graham et al., 2005; Roychowdhury, 2006; Cohen et al., 2008; Bartov and Cohen, 2009; Cohen and Zarowin, 2010; McInnis and Collins, 2011) have documented the prevalence of REM in business practice. To the best of our knowledge, we are the first paper to study the role of REM in syndicated loans. Although there are some prior papers studying the effect of REM (Ge and Kim, 2014) or REM volatility (Chen et al., 2014) on corporate bond yields, their findings do not necessarily generalise to the private debt market. Since loan providers are normally a concentrated group of professional creditors while bond holders are a dispersed group of public investors, there are significant differences between these two groups of lenders in their information collecting and processing techniques, renegotiation flexibility and monitoring ability. These differences may give rise to different reactions to REM.

Our study also sheds new light on the consequences of REM. The extant literature has been controversial with respect to the economic implications of REM. From a private lender perspective, our results are consistent with REM as detrimental to firm value rather than signalling superior future firm performance.

Finally, prior studies on REM do not distinguish between its impact on earnings quality and future cash flows. Syndicated loans offer a unique opportunity to determine the relative importance of information risk or default risk as a driver of lenders' responses to REM. PPPs in syndicated loan contracts permit an investigation of the alternative sources of risk arising from REM. Our results are consistent with lenders being more concerned about the incremental default risk induced by REM rather than the information risk.

The remainder of this paper proceeds as follows. Section 2 reviews the relevant literature and develops two testable hypotheses. The research design is presented in Section 3. Section 4 describes the sample selection and the summary statistics. Section 5 reports the empirical results. In Section 6 we examine the sensitivity of our results. Section 7 concludes the study.

2. Literature Review and Hypothesis Development

2.1 Evidence on REM

REM is defined in Roychowdhury (2006) as "management actions that deviate from normal business practices, undertaken with the primary objective of meeting certain earnings thresholds" (p. 336). Examples of REM include reducing R&D expenditures to cut expenses, offering limited time price discounts to temporarily boost sales, overproducing to reduce cost of goods sold (COGS), changing shipment schedules to accelerate the recognition of revenue and selling fixed assets to inflate reported earnings.

The prevalence of REM in business practice has been documented in prior literature. In their survey study, Graham et al. (2005) report:

> [W]e find strong evidence that managers take real economic actions to maintain accounting appearances. In particular, 80% of survey participants report that they would decrease discretionary spending on R&D, advertising, and maintenance to meet an earnings target. More than half (55.3%) state that they would delay starting a new project to meet an earnings target, even if such a delay entailed a small sacrifice in value (p. 32, 35).

Consistent with Graham et al. (2005)'s survey results, Roychowdhury (2006) finds empirical evidence of firms engaging in sales manipulation, overproduction and aggressive reduction of discretionary expenditures to avoid losses. Cohen et al. (2008) and Bartov and Cohen (2009) document that firms shifted away from AEM and switched to REM after the passage of the Sarbanes-Oxley Act. Similarly, Cohen and Zarowin (2010) show that firms use REM to inflate earnings prior to seasoned equity offerings (SEOs). Bens et al. (2002) document that in order to avoid earnings per share dilution caused by employee stock option exercises, firms cut R&D to finance share repurchases. Dechow and Sloan (1991) find a significant reduction in R&D expenditures when CEOs are about to retire and have incentives to boost short-term earnings. Baber et al. (1991) and Bushee (1998) also provide evidence consistent with firms reducing investments in R&D to meet certain earnings benchmarks. Bartov (1993) shows that firms attempt to avoid negative earnings growth and debt covenant violations through selling fixed assets.

2.2 The Impact of REM on Loan Interest Rates

The value-destroying view in the prior literature posits that REM is an opportunistic activity that both increases a firm's information risk and default risk. First, REM obscures a firm's true performance and increases the information asymmetry between lenders and managers. In addition, it sacrifices a firm's future cash flows in exchange for current reported earnings. Roychowdhury (2006) points out that using aggressive price discounts to increase sales volume can lead customers to expect such discounts in future periods as well. If the original price is restored in the future, there is a risk that the sales volume would fall even below the original level and if the price discounts are sustained, sales margin would decline. Both circumstances are detrimental to long-term cash flows. Overproduction generates greater inventory storage and maintenance costs and, if the inventories

become obsolete, firms have to pay disposal expenses. Reducing investments in discretionary expenditures could save current cash outflows, however, probably at the expense of future cash inflows. For example, forgoing R&D projects may impede the firm's ability to launch new products and improve existing products in the future and thereby cause the firm to lose market share to its competitors. Lenders rely on firms' future cash flows to collect interest payments and recover their principal. Therefore, REM's detrimental effect on firm's future cash flows should be of particular concern to lenders.

Moreover, a number of studies provide empirical evidence that REM impairs long-term firm value. In particular, Cohen and Zarowin (2010) find that REM conducted around seasoned equity offerings (SEO) is associated with post-SEO earnings declines. Bhojraj et al. (2009) document that firms beating analyst forecasts through REM exhibit poorer operating performance and stock market returns in the subsequent three-year period than firms missing analyst forecasts without engaging in REM. Similarly, Osma and Young (2009) report that UK firms beating last year's earnings via reducing R&D investments have lower returns than firms achieving earnings growth without cutting R&D. Bens et al. (2002) show that firms that cut R&D investments to finance share repurchases are subject to future earnings declines. In addition, Bushee (1998) and Roychowdhury (2006) document a negative relation between institutional ownership and REM. Since institutional investors are more sophisticated and capable of assessing firm performance, the negative association between their presence and REM suggests that REM is detrimental to firm value. According to the above evidence, lenders should impose higher interest spreads on loans issued to firms engaging in REM to address the increased information risk and default risk.

Conversely, Gunny (2010) proposes that REM conveys a signal of superior future firm performance. She argues that due to credibility and litigation concerns, only managers confident in superior future performance will use REM to meet earnings thresholds since they expect future earnings growth to outweigh the costs of REM. According to this value-signalling view, lenders should welcome REM

and offer lower interest rates to firms engaging in REM. Apart from punishing or rewarding REM, there is an alternative possibility that lenders may overlook REM, since REM is hard to detect for outside stakeholders. It is costly for lenders to analyse a firm's complex operating system and judge whether sub-optimal activities are carried out deliberately. Lenders would not respond to REM if they were not able to detect it.

Given these competing accounts of the economic implications of REM we do not specify a unidirectional alternative hypothesis. However, it should be noted that the evidence from Ge and Kim (2014) for bond yields would lead to an expectation that there should be a positive relationship. Our first hypothesis is:

H1: REM is not associated with the loan interest spreads.

2.3 The Impact of REM on PPP metric

In the second part of the study, we try to distinguish REM's impacts on information risk and default risk and investigate which of these two impacts are more important for lenders. In order to answer this question, we examine how the borrower engagement with REM affects the choice between accounting ratios and credit ratings as the performance measure in PPPs.

According to Ball et al. (2008) and Costello and Wittenberg-Moerman (2011), conditional on choosing to include a PPP, lenders are likely to sacrifice the timeliness imbedded in accounting ratios and pursue the superior reliability in credit ratings if the borrower's accounting numbers are of low quality. On the other hand, lenders attach greater importance to the timeliness of the performance measure when borrowers are subject to a higher default risk. Moreover, since firms with a higher default risk suffer greater uncertainty, the reliability of credit ratings reduces as the default risk increases. As a result, lenders are more likely to choose credit ratings (accounting ratios) as the performance measure if they are more concerned about the incremental information (default) risk induced by the borrowers' REM activities. In this session, we test the following null hypothesis:

H2: REM is not associated with the choice of performance measure in PPPs.

3. Research Design

3.1 Proxies for REM

Following prior literature (Roychowdhury, 2006; Cohen et al., 2008; Bartov and Cohen, 2009; Cohen and Zarowin, 2010; Zang, 2011) , we focus on three REM activities, namely providing price discounts or more lenient credit terms to boost sales volumes temporarily, cutting discretionary expenditures to reduce expense and overproduction to decrease COGS. These activities are likely to cause a firm's CFO, discretionary expenditures and production costs (defined as COGS plus changes in inventory) to deviate from its peers in the same industry and year. In particular, providing price discounts or more lenient credit terms reduces sales margins, leading to abnormally low cash inflows and high production costs relative to the sales level. Discretionary expenditures include R&D, advertising expense and selling, general and administrative (SG&A) expenses. Reducing the investments in these activities gives rise to abnormally low discretionary expenditures. Given these activities are generally paid in cash, cutting these investments also lowers cash outflows and therefore has a positive impact on current CFO. Producing more goods than necessary allows fixed overhead costs to be spread over a larger number of units, lowering fixed costs per unit. This reduction brings down the reported COGS as long as the reduction in fixed costs per unit is not offset by any increase in marginal costs per unit. However, the incremental marginal costs incurred, e.g., additional inventory storing cost, result in abnormally high production costs and low CFO relative to the sales level.

According to these arguments, the direction and amount of abnormal CFO, discretionary expenditures and production costs could indicate the existence and scale of REM. To capture the abnormal CFO, discretionary expenditures and production costs, we rely on the models developed by Dechow et al. (1998) as implemented in Roychowdhury (2006) which express the normal levels of these variables as linear regressions of sales and changes in sales. We estimate these regressions for

each Fama and French (1997) industry group and year, requiring at least 20 observations for each estimate. The extreme values of all variables are winsorized at the 1st and 99th percentiles. The abnormal levels of CFO, discretionary expenditures and production costs are captured by the error terms of these regressions.

Specifically, we estimate the normal level of CFO using the following regression:

$$\frac{CFO_{i,t}}{Asset_{i,t-1}} = \kappa_0 + \kappa_1 \frac{1}{Asset_{i,t-1}} + \kappa_2 \frac{Sales_{i,t}}{Asset_{i,t-1}} + \kappa_3 \frac{\Delta Sales_{i,t}}{Asset_{i,t-1}} + \epsilon_{i,t} \quad (1)$$

where $CFO_{i,t}$ is firm i's cash flow from operations before discretionary expenditures in year t;[1] $Asset_{i,t}$ is firm i's total assets at the end of year t; $Sales_{i,t}$ is firm i's sales revenue during year t and $\Delta Sales_{i,t}$ is the change in firm i's revenue between year t and t-1. The abnormal level of CFO (*Ab.CFO*) is computed as the difference between actual CFO and the predicted CFO from Eq. (1). A lower value of *Ab.CFO* indicates a greater level of REM.

We estimate the normal level of discretionary expenditures as follows:

$$\frac{Disc.Exp_{i,t}}{Asset_{i,t-1}} = \kappa_0 + \kappa_1 \frac{1}{Asset_{i,t-1}} + \kappa_2 \frac{Sales_{i,t-1}}{Asset_{i,t-1}} + \epsilon_{i,t} \quad (2)$$

where $Disc.Exp_{i,t}$ represents firm i's discretionary expenditures in year t, defined as the sum of R&D, advertising and SG&A expenses. Other variables are defined as in Eq. (1). Abnormal discretionary

[1] Both sales manipulation and overproduction have a negative impact on CFO, but the reduction of discretionary expenditures has a positive impact on CFO. To avoid this offsetting effect, we follow McInnis and Collins (2011) and add discretionary expenditures back to CFO.

expenditures (*Ab.Disc.Exp*) are estimated using the residuals from Eq. (2) with a lower value of *Ab.Disc.Exp* implying a greater level of REM.

The normal level of production costs is modelled with the following regression:

$$\frac{Prod.Cost_{i,t}}{Asset_{i,t-1}} = \kappa_0 + \kappa_1 \frac{1}{Asset_{i,t-1}} + \kappa_2 \frac{Sales_{i,t}}{Asset_{i,t-1}} + \kappa_3 \frac{\Delta Sales_{i,t}}{Asset_{i,t-1}} + \kappa_4 \frac{\Delta Sales_{i,t-1}}{Asset_{i,t-1}} + \epsilon_{i,t} \quad (3)$$

where $Prod.Cost_{i,t}$ represents firm i's production costs in year t, defined as the sum of COGS and the changes in inventory. Other variables are defined as in Eq. (1). Abnormal production costs (*Ab.Prod.Cost*) are captured by the residuals from Eq. (3) with a higher value of *Ab.Prod.Cost* indicating a greater level of REM. We use *Ab.CFO*, *Ab.Disc.Exp* and *Ab.Prod.Cost* to proxy for REM.

3.2 The Impact of REM on Loan Interest Rates

3.2.1 Main tests

We empirically test the impact of REM on loan interest rates by estimating the following OLS regression:

$$\begin{aligned} IntSpread = {} & \beta_0 + \beta_1\, Ab.CFO/Ab.Disc.Exp/Ab.Prod.Cost + \beta_2\, Firm\ Size + \beta_3\, Leverage \\ & + \beta_4\, IntCov + \beta_5\, CurRatio + \beta_6\, Mar\ to\ Book + \beta_7\, Tangibility + \beta_8\, ROA \\ & + \beta_9\, \sigma\ (ROA) + \beta_{10}\, Z\text{-}Score + \beta_{11}\, Loan\ Size + \beta_{12}\, InstLoan + \beta_{13} \\ & Revolver + \beta_{14}\, PPP\_Presence + Loan\ Purpose\ Effects + Industry\ Effects \\ & + Year\ Effects + \varepsilon. \end{aligned} \quad (4)$$

Our primary interest is on β_1. However, due to mixed evidence of the economic implications of REM documented in prior literature, we don't have a specific prediction on the sign of β_1. Following Francis et al. (2005), we divide REM variables into decile ranks with D1 representing the highest values and D10 representing the lowest values and use the decile ranks instead of the raw REM values in all regressions to control for outliers and non-linearities and to facilitate the interpretation of results. The loan variables are estimated at loan initiation while the firm variables are estimated at the end of the fiscal year immediately prior to loan initiation. The statistical significance of the estimated coefficients is based on Rogers (1994) clustered standard errors correcting for within-firm and within-year correlations. To make sure that our tests are not subject to multicollinearity problems, we check the variance inflation factor (VIF) of each independent variable in the regressions. They are all below the generally accepted threshold of 10.

The test variables in this study are *Ab.CFO*, *Ab.Disc.Exp* and *Ab.Prod.Cost*. The response variable is the annual spreads paid over LIBOR for each dollar drawn down from the loan (*IntSpread*).

We also control for a set of firm-specific and loan-specific characteristics which are likely to affect the loan interest spreads. Our choice of control variables follows the previous literature which also investigates the determinants of loan interest rates (Bharath et al., 2008; Zhang, 2008; Graham, Li and Qiu, 2008; Costello and Wittenberg-Moerman, 2011). We first control for the size of the borrowing firm (*Size*) measured by the natural logarithm of the firm's total assets. Smaller firms are more informationally opaque, less capable of accessing external financing and more vulnerable to distress. Loans issued to smaller firms should have higher interest rates. We also control for the default risk of the borrowing firm using a set of variables on the firm's leverage ratio (*Leverage*), interest coverage ratio (*IntCov*), current ratio (*Current*), return on assets (*ROA*), earnings volatility ($\sigma(ROA)$) and Altman (1968) Z-score (*Z-score*). Firms with a higher leverage ratio and earnings volatility and a lower interest coverage ratio, current ratio, return on assets, and Z-score are subject to a higher risk of default. We expect them to borrow with higher interest rates. Tangible assets can

be sold more easily to recover the loan in the event of default than intangible assets. We control for the borrowing firm's tangibility (*Tangibility*) since firms with lower tangibility are likely to incur higher interest cost. The borrowing firm's market to book ratio (*Mar to Book*) is also included as a control variable. The market to book ratio captures firms' growth opportunities. Firms with more growth potential are subject to higher uncertainty and therefore may incur higher interest rates. However, the market to book ratio also captures the additional value over book assets that debt holders can access in the event of default. In this instance, higher market to book ratios should be associated with lower interest rates.

In addition to the above variables on the borrowing firm's characteristics, we also control for a set of variables relating to loan characteristics. Loan size (*Loan Size*) is controlled for to address the possibility that larger loans enjoy lower interest rates due to the economies-of-scale effect in lending and the stronger incentives of the lead arrangers to carry out screening and monitoring efforts. We further control for three dummy variables indicating whether the loan is a revolving loan (*Revolver*), whether the loan is funded by institutional investors (*Inst Loan*) and whether the loan contains a performance pricing provision (*PPP_Presence*). Revolving loans are similar to credit cards allowing the borrowers to use credits available under the commitment in a flexible way and only pay interest for the part of the loan that is utilised. Prior research (Asquith et al.,2005; Harjoto, Mullineaux and Yi, 2006; Zhang, 2008; Costello and Wittenberg-Moerman, 2011) finds that revolving loans have lower interest spreads. Institutional loans are generally riskier than bank loans, thus we expect them to incur higher interest rates. Asquith et al. (2005) and Panyagometh and Roberts (2010) argue that the presence of PPP attenuates agency problems. Borrowers are punished or rewarded in a timely way in accordance with changes in their credit qualities without triggering costly re-negotiations. The presence of PPP also signals better borrower credit quality since borrowers expecting a deterioration in their credit qualities are unlikely to accept PPPs that would increase their future interest cost. Therefore, the presence of PPP should lead to lower interest rates.

Finally, we control for loan purpose fixed effects based on seven purposes including acquisition lines, LBO/MBO/SBO, takeover, debt repay/recapitalization, corporate purpose, working capital, and other purposes. We also control for year fixed effects and industry fixed effects using the Fama and French (1997) 48 industry groups.

3.2.2 Suspect Sample tests

Since the REM proxies are measured with the deviations from the predicted values in each regression model run by industry and year, they represent deviations from the industry-year mean. However, deviations from other firms in the same industry and year do not necessarily imply earnings management. For example, a relatively low CFO given the sales level might be due to obsolete products that force the managers to offer aggressive discounts or due to a business strategy to beat other competitors with cheap prices; a relatively low R&D investment might be caused by decreasing returns on R&D projects or lacking of relevant personnel; and a relatively high production cost might be attributed to inefficient logistics or bad relations with the suppliers. These economic fundamentals are likely to affect a firm's credit risk as well. As a result, the impact of REM proxies on interest rates documented from the previous session might be driven by lenders' responses to these economic fundamentals rather than REM.

In order to address the above issue and to increase the power of our tests, we constrain our sample to loans issued during firm-years which are suspected to involve earnings management. Following prior literature (Roychowdhury, 2006; Cohen et al., 2008; Gunny, 2010; Zang, 2012; Zhao et al., 2012), we define suspect firm-years as those when reported earnings just meet/beat important earnings benchmarks. We adopt three earnings benchmarks: zero earnings, last year's earnings and analyst forecast consensus. Suspect firm-years just meeting/beating zero (last year's) earnings are defined as those with earnings before extraordinary items (changes in earnings before extraordinary items) scaled by lagged total assets falling within the interval [0, 0.005). Suspects just meeting/beating analyst forecast consensus are those with actual EPS minus the last analyst forecast

consensus before the fiscal year-end date falling within the interval [0,0.01). In order to control for the self-selection bias caused by differences between the suspect firm-years and the non-suspect firm-years, we estimate a two-stage Heckman (1979) selection model. In the first stage, we estimate a probit model which explains the earnings management suspect firm-years and calculate the inverse Mills ratio (*IMR*). In the second stage, we re-estimate Eq. (4) using the suspect sample and include the inverse Mills ratio obtained from stage one as an additional control variable to mitigate the potential self-selection problem.

Our first stage model (Eq. (5)) is derived from Zang (2012):

$$Prob[Suspect_{i,t} = 1] = Probit(\gamma_0 + \gamma_1 HabBeater_{i,t} + \gamma_2 NumAnalyst_{i,t} + \gamma_3 New\ Issue_{i,t+1} + \gamma_4 Shares_{i,t} + \gamma_5 Mar\ to\ Book_{i,t-1} + \gamma_6 ROA_{i,t} + Year\ Effects + \varepsilon_{i,t}). \quad (5)$$

where *Suspect* is an indicator variable equal to one for suspect firm-years and 0 for non-suspect firm-years; *HabBeater* is the number of times a firm meeting/beating analysts' forecast consensus in the past four quarters; *NumAnalyst* is the natural logarithm of 1 plus the number of analysts following the firm; *New Issue* is an indicator variable equal to one if the firm issues new shares and 0 otherwise; *Shares* is the natural logarithm of the number of shares outstanding; *Mar to Book* and *ROA* are defined as in Eq. (4).[2] We estimate Eq. (5) by running a pooled probit model using all observations from the matched Compustat/IBES universe with non-missing values on any of the variables over the 1994 to 2011 period in order to match with the loan sample period.

3.2.3 Joint Determination of Loan Contract Terms

In our previous regressions of interest spreads, we did not control for the effect of other loan contract terms. However, according to Melnik and Plaut (1986), a loan contract is a package of

[2] See Cohen and Zarowin (2010) and Zang (2012) for predicted signs of the coefficients on these variables.

multiple contract terms and these contract terms cannot be split and treated separately. Dennis et al. (2000) and Bharath et al. (2008) provide empirical evidence on the simultaneous relations among interest rate, maturity and the likelihood of including a collateral requirement. The reason why we did not indude these contract terms as control variables in the previous reduced-form regressions is because of an endogeneity concern. The potential endogeneity issue due to simultaneities among various contract terms may render the estimates from the reduced-form OLS regressions to be biased and inconsistent. In order to address the impact of other contract terms while controlling for the endogeneity issue, we adopt a 3SLS approach.[3] In the 3SLS system, *IntSpread*, *Maturity* and *Collateral* are treated as endogenous variables and each of these contract terms is regressed on other two contract terms, its instrument, REM proxies and a common set of control variables. Following Li et al. (2010), we use the sample median of all loans issued by firms within the same Fama and French (1997) industry and calendar year to instrument interest rate, maturity and collateral requirement respectively. At least three observations are required to calculate the sample median. We expect *IntSpread*, *Maturity* and *Collateral* to be positively associated with their industry-year medians.[4]

3.3 The Impact of REM on PPP Metric

We investigate the impact of REM on the choice between accounting ratios and credit ratings as the performance measure in PPPs by estimating the following Probit regression:

$$Prob[PPP\_AccNum = 1] = Probit\,(\kappa_0 + \kappa_1\, Ab.CFO/Ab.Disc.Exp/Ab.Prod.Cost + \kappa_2\, Firm\ Size + \kappa_3\, Leverage + \kappa_4\, IntCov + \kappa_5\, ROA + \kappa_6\, CreRat + \kappa_7\, Loan\ Size +$$

[3] 3SLS extends 2SLS by taking into account the covariances of the disturbance terms in the equations system. We perform a Hausman test against the null hypothesis that all exogenous variables are uncorrelated with all disturbance terms. A documented p-value of 1 fails to reject the null hypothesis, indicating that both the 2SLS and the 3SLS estimators are consistent but only the 3SLS estimator is asymptotically efficient.

[4] We test the strength of each instrument by performing an F-test against the null hypothesis that the excluded instrument is irrelevant in the first-stage regression. The documented F-statistic is larger than the common threshold of 10 for each instrument.

$$\kappa_8\, InstLoan + \kappa_9\, Revolver + \kappa_{10}\, PPP\_Increasing + \kappa_{11}\, IntSpread +$$

$$Loan\ Purpose\ Effects + Industry\ Effects + Year\ Effects + \varepsilon). \quad (6)$$

where *PPP_AccNum* is an indicator variable equal to one if the PPP is based on accounting ratios rather than credit ratings and zero otherwise. *Ab.CFO, Ab.Disc.Exp* and *Ab.Prod.Cost* are the REM proxies. Their coefficients are our primary focus in this section. Since REM may increase both the borrower's information risk and its default risk and these two types of risks may lead to opposite choices of PPP metric, we don't have a specific prediction on the sign of κ_1. Our choice of control variables for the PPP metric regressions follows Ball et al. (2008) and Costello and Wittenberg-Moerman (2011). *CreRat* is the numerical equivalent of the borrower's S&P, Moody's, Fitch, or DPR senior debt rating. The highest rating is set as 1, through 25 for the lowest rating (excluding suspended and not rated). We expect that firms with higher *CreRat* are more likely to have accounting ratios in their PPPs. *PPP_Increasing* is an indicator variable equal to one if the PPP leads to an increase in interest spreads when certain thresholds are met and zero otherwise. According to prior literature, PPPs with an interest increasing condition are more likely to be based on credit ratings. We also control for interest spreads, since prior literature shows a positive correlation between interest spreads and the likelihood of choosing accounting ratios as the PPP metric. Other control variables are as defined in Eq. (4). As in Eq. (4), *PPP_AccNum* and other loan variables are estimated at loan initiation while REM proxies and other firm variables are estimated at the end of the fiscal year immediately prior to loan initiation.

4. Sample Selection and Descriptive Statistics

The starting sample for the interest rate tests consists of 125,263 dollar-denominated loans issued to US companies recorded in the Thomson Reuters LPC DealScan Database.[5] We eliminate loans

[5] We use the CD version of DealScan Database which contains a snapshot of the complete online dataset as of the end of Mar 2013.

issued before 1996 since the data collection for the DealScan Database commenced in 1996. The loan information for the previous years (1985 - 1995) was recorded retroactively and data coverage for this period may be incomplete. The remaining sample contains 98,122 loans. The financial information of the borrowing firm is obtained from Compustat. Loan variables are matched with firm variables using the Dealscan_ Compustat_ Link_ 31 Aug 2012 file provided by Chava and Roberts (2008).[6] After the matching process, 49,340 loans remain in the sample. We further remove 12,333 loans missing data on the loan characteristics required for the main tests and 23,557 loans missing accounting data. Finally, we exclude 1,173 loans issued to financial (SIC code 6000-6500) and regulated (SIC code 4400-5000) firms. The final sample consists of 12,277 loans issued to 2,588 companies with an issuance date between January 1996 and June 2012. The sample selection procedure is described in Table 1.

The PPP sample selection starts with 26,747 loans including PPPs in the DealScan database up until Mar 2013. We first remove 2,175 loans with PPP based on neither accounting ratios nor credit ratings or both accounting ratios and credit ratings. Similar to the interest rate sample, we then only keep dollar-denominated loans issued to US companies and eliminate loans issued before 1996, loans that could not be matched with the financial data in Compustat, loans issued to financial or regulated firms and loans missing data on REM variables and control variables in the PPP metric regressions. After applying these filters, our final PPP sample consists of 3,941 loans issued to 1,031 companies with an issuance date between January 1996 and June 2012. Since credit rating is one of the control variables, our sample selection assures that all loans included in the PPP sample are with available credit ratings, in order to avoid the situation where accounting ratios are chosen as the performance measure simply because credit ratings are not available.

Table 2 Panel A reports the summary statistics for the interest rate sample. The mean (median) values of *Ab.CFO*, *Ab.Disc.Exp* and *Ab.Prod.Cost* are -0.038 (-0.032), -0.079 (-0.079) and -0.004 (-

[6] We assume that there are two months intervals between the fiscal year end date and the financial statements issue date.

0.007) respectively. These distributions are generally comparable to those documented in prior studies (Cohen et al., 2008; Zhao et al., 2012; Ge and Kim, 2014).

The mean (median) interest spreads and maturity are 188.138 (175.000) basis points and 45.353 (48.000) months respectively. 72.2% of the loans in the interest rate sample have collateral. The distribution of total assets of the borrowing firms has a mean of $2948.935 million, a median of $743.044 million and a standard deviation of $6122.743 million, suggesting that the distribution is skewed and widely dispersed. The borrowing firms have a mean (median) leverage of 0.241 (0.212), a mean (median) interest coverage ratio of 17.765 (4.487), a mean (median) current ratio of 1.941 (1.679), a mean (median) market-to-book ratio of 1.751 (1.456), a mean (median) tangibility of 0.460 (0.454), a mean (median) ROA of 0.035 (0.045), a mean (median) ROA volatility of 0.059 (0.036) and a mean (median) Z-Score of 3.596 (3.041). The loans have a mean (median) amount of $293.311 ($130.000) million, with a large standard deviation of $439.668 million. 8.3% of the sample loans are institutional term loans while 72.8% are revolving loans. 55.2% of the sample loans have PPPs.

The summary statistics for the PPP sample are presented in Table 2 Panel B. The distributions of the REM variables are very similar to those in the interest rate sample. However, the average total assets of the borrowing firms (£5010.644 million compared with £2948.935 million) and the average loan amount (£509.450 million compared with £293.311 million) are considerably larger in the PPP sample. The mean interest spreads are 160 bps above LIBOR, 28 bps lower than in the interest rate sample, consistent with the notion that the existence of PPP decreases interest rates. The mean credit rating is 10.928, roughly equivalent to the S&P credit rating grade BB+. 54.2% of the PPPs are based on accounting numbers instead of credit ratings. 70.8% of the PPPs contain an interest-increasing condition.

Table 3 Panel A provides the Pearson correlation matrix for the variables in the interest rate tests. We document strong correlations among the three REM variables, suggesting that firms implement various REM tactics simultaneously. Further, both *Ab.Disc.Exp* and *Ab.Prod.Cost* are positively

related to *IntSpread* while *Ab.CFO* reveals a negative association with *IntSpread*. The correlations between REM variables and *IntSpread* provide mixed evidence. The associations between *Ab.CFO/Ab.Prod.Cost* and *IntSpread* are consistent with lenders viewing REM as a value-destroying activity and imposing higher interest rates to protect themselves from the increased risk. Conversely, the association between *Ab.Disc.Exp* and *IntSpread* suggests that lenders perceive REM as value-signalling and reward firms engaging in REM with reduced interest rates. Panel B of Table 3 reports The Pearson correlation matrix for the variables in the PPP tests. We document a significantly negative correlation between *PPP_AccNum* and *Ab.CFO* and a significantly positive correlation between *PPP_AccNum* and *Ab.Prod.Cost*, implying that REM increases the propensity of choosing accounting ratios as the performance measure. In addition, we find strong positive correlations between *PPP_AccNum* and *CreRat* (0.735)/*IntSpread* (0.613), consistent with the argument that lenders are more likely to contract on accounting ratios instead of credit ratings when the borrower is subject to a higher default risk.

5. Empirical Results

5.1 The Impact of REM on Loan Interest Rates

5.1.1 Main Results

Table 4 presents the estimation results of Eq. (4). In Column 1, we document a negative coefficient of -1.472 on *Ab.CFO*, significant at the 1% level, suggesting that firms incur higher interest costs when they exhibit a lower abnormal CFO. Since lower abnormal CFO represents greater REM, this result is consistent with lenders detecting and penalising borrower's REM activities. Economically, the increase in interest spreads corresponding to one unit of downward move in abnormal CFO decile rank is 1.472 bps and the difference in interest spreads between the highest and the lowest abnormal CFO decile amounts to 13.248 bps, which is as much as 7% of the mean interest spreads in our sample, implying that the impact of REM on interest spreads is both statistically and

economically significant. Column 2 reveals the association between *Ab.Disc.Exp* and *IntSpread*. Like *Ab.CFO*, *Ab.Disc.Exp* is also an inverse measure of REM. A significantly negative sign on its coefficient is consistent with lenders punishing REM. Economically, for a one decile rank decrease in abnormal discretionary expenditures, interest spreads increase by 0.904 bps and the difference in interest spreads between the highest and the lowest abnormal discretionary expenditures decile equals 8.136 bps, accounting for 4.3% of the mean interest spreads in our sample. The sign of the estimated coefficient on *Ab.Prod.Cost* reported in Column 3 also supports the argument that REM leads to higher interest rates. However, this coefficient is not statistically significant at conventional levels.

With respect to the firm-specific control variables, consistent with prior studies on the determinants of loan interest rates (Bharath et al., 2008; Zhang, 2008; Graham, Li and Qiu, 2008; Costello and Wittenberg-Moerman, 2011), we find that smaller firms with higher leverage and ROA volatility and lower current ratio, market to book ratio, tangibility ratio, ROA and Z-Score are subject to higher interest spreads. Interestingly, we document significantly positive coefficients on the Interest coverage ratio. This contradicts the conventional wisdom that a higher interest coverage ratio indicates the ability of the borrowing firm to make interest payments and should be negatively associated with interest rates. With respect to the loan-specific control variables, our results show that *IntSpread* is significantly positively associated with *InstLoan* while significantly negatively related to *Loan Size*, *Revolver* and *PPP_Presence*.

Chen et al. (2014) argue that the impact of abnormal production costs should be more pronounced for manufacturing firms since abnormally high production costs can be caused either by sales manipulation or overproduction and overproduction only applies to manufacturing firms. Therefore, following Chen et al. (2014), we constrain our sample to loans issued to manufacturing firms and re-estimate the regression of *IntSpread* on *Ab.Prod.Cost* in Column 4. The result shows that the coefficient on *Ab.Prod.Cost* turns from insignificant with the full sample to statistically significant at the 1% level, and its positive sign remains, consistent with lenders detecting and penalising REM

activities. Economically, a one decile increase in abnormal production costs translates to 1.539 bps increase in interest spreads. Firms in the highest abnormal production costs decile have to borrow with interest rates 13.851 bps higher than those in the lowest decile.

In Column 5-7, we investigate the impact of the borrower's leverage ratio on the relation between REM variables and interest rates by adding an interaction term between the REM variables and the leverage ratio to Eq. (4). Consistent with REM variables, the decile ranks of *Leverage* instead of its raw values are used in these regressions. In order to facilitate the interpretation of results and to reduce multicollinearity among the interaction term and the interacted variables, we centre each continuous independent variable in the regressions (i.e., subtract the mean from each continuous variable).[7] The coefficients on *Ab.CFO*Leverage* and *Ab.Disc.Exp*Leverage* are both significantly negative, implying that an increasing leverage ratio magnifies the effect of REM variables on interest spreads. Economically, for a one decile rank increase in leverage, the aggregated coefficient on *Ab.CFO (Ab.Disc.Exp)* decreases by 0.475 (0.429) and the difference between the aggregated coefficients on *Ab.CFO (Ab.Disc.Exp)* with the highest and the lowest leverage deciles is 4.725 (3.861). That is to say, with the highest leverage decile rank, the difference in interest spreads between the highest and the lowest *Ab.CFO (Ab.Disc.Exp)* deciles is 42.525 (34.749) bps larger than with the lowest leverage decile rank. In Column 7, the coefficient on *Ab.Prod.Cost* is insignificantly different from zero, implying that abnormal production costs do not have a significant impact on interest spreads under the average leverage ratio. However, the coefficient on *Ab.Prod.Cost*Leverage* is significantly positive (0.354, t-statistic = 2.479) at the 5% level, indicating that as the leverage ratio increases, the impact of abnormal production costs on interest spreads increases as well. The above results consistently show that lenders are far more sensitive to REM activities for borrowers with higher leverage ratios and this is reflected in spreads.

[7] The algebra of centred regression is given in Aiken and West (1991).

5.1.2 Suspect Sample Results

The results of the Heckman (1979) first-stage regression are reported in Table 5. Consistent with Zang (2012), our results show that firms consistently meeting/beating earnings benchmarks in the past, having a larger amount of shares outstanding and with a higher ROA are more likely to be suspect firms. In contrast to Zang (2012), we find that firms with a larger analyst following are less likely to meet/beat earnings benchmarks. However, this finding is consistent with that reported in Cohen and Zarowin (2010). We do not find statistically significant relations between *New Issue*/*Mar to Book* and *Suspect*.

The results of the Heckman (1979) second-stage regressions are presented in Table 6. 13.6% of the loans from the full sample (12,277 loans) are included in the suspect sample (1,666 loans). Compared with the results reported in Table 4, the coefficient on *Ab.CFO* is still significantly negative. The coefficient on *Ab.Disc.Exp* remains negative, but becomes insignificant. We document a significantly positive relation between *Ab.Prod.Cost* and *IntSpread*. These results are largely consistent with those in Table 4 and indicate that lenders view REM as inducing incremental risk and charge borrowers engaging in REM higher interest rates. The coefficients on *IMR* are marginally significant, confirming the importance of addressing the sample selection bias. The loadings on other control variables are generally in line with those documented in Table 4, except that the coefficients on interest coverage, current ratio, tangibility and Z-Score become insignificant. Overall, our main conclusions are not affected by constraining the sample to suspect firm-years, suggesting that our results are unlikely to be driven solely by firm fundamentals.

5.1.3 3-SLS Tests Results

Table 7 reports the results of the 3-SLS tests. The coefficients on our instrumental variables are all significantly positive, confirming a correct identification strategy. We find some evidence of correlations among loan contract terms. Specifically, loans with longer maturities enjoy lower interest rates; loans with collateral requirements obtain longer maturities and loans with higher

interest rates are more likely to be secured. With regard to the impact of REM, allowing for the simultaneities among various loan contract terms does not alter our main conclusion that lenders uncover and penalise borrower engagement with REM activities. Specifically, the coefficients on the REM variables in the *IntSpread* regressions (Column (1)-(3)) are statistically and economically similar to those reported in Column (1)-(3) of Table 4. Moreover, the results of the *Maturity* regressions and the *Collateral* regressions show that lenders impose shorter maturities and collateral requirements if the borrower conducts REM.

5.2 The Impact of REM on PPP Metric

Table 8 reports the estimation results of Eq. (6). The coefficient on *Ab.CFO* has a negative sign, suggesting that firms with lower *Ab.CFO* are more likely to have accounting-ratio based PPPs. However, this coefficient is not statistically significant at conventional levels. The coefficient on *Ab.Disc.Exp* is negative and significant. Since *Ab.Disc.Exp* is an inverse measure of REM, a negative sign on its coefficient is consistent with lenders preferring the timelier accounting ratios as opposed to the more reliable credit ratings when the borrower engages in REM. This finding implies that lenders are more concerned about the incremental default risk induced by the borrower's REM activities than the information risk. In Column 3 we document a positive effect of *Ab.Prod.Cost* on the likelihood of contracting on accounting ratios. Considering that higher *Ab.Prod.Cost* implies greater REM, this finding supports the previous inference that REM's adverse impact on a firm's future cash flows and therefore the long-term firm value outweighs its negative effect on the firm's accounting quality. With regard to the control variables, consistent with our predictions and those reported in prior literature, we find that PPPs in risker loans with higher interest rates and issued to firms with poorer credit ratings are more likely to be based on accounting ratios. We also document negative correlations between the firm size/institutional loan and the likelihood of choosing accounting ratios.

6. Robustness Tests

In this section, we analyse the sensitivity of our results to the use of raw REM measures rather than deciles and the inclusion of accruals quality as a control variable.

In previous tests, the decile ranks of REM variables are used in order to control for extreme outliers and non-linearities and to facilitate the interpretation of results. In this section, we investigate whether our main results are robust to using raw REM variables instead of their decile ranks. As Table 9 Column 1-3 show, we still document a significantly negative coefficient on *Ab.CFO* in the *IntSpread* regression, supporting our previous conclusion that lenders charge higher interest rates on firms engaging in REM activities. However, the coefficient on *Ab.Disc.Exp* is no longer significant. Column 4-6 replicate the previous regressions of PPP metric. The magnitude of the coefficients on the REM variables is amplified, but their statistical and economic significance is unchanged. Our main conclusions still hold when using the raw values of REM variables.

Since firms can manipulate their earnings numbers through real and/or accrual-based earnings management, we test the robustness of our results to controlling for the effects of accruals quality (AQ). We measure AQ using the FLOS model (Francis et al., 2005) as below:

$$\frac{TCA_{i,t}}{Asset_{i,t-1}} = \rho_0 + \rho_1 \frac{CFO_{i,t-1}}{Asset_{i,t-1}} + \rho_2 \frac{CFO_{i,t}}{Asset_{i,t-1}} + \rho_3 \frac{CFO_{i,t+1}}{Asset_{i,t-1}} + \rho_4 \frac{\Delta Sales_{i,t}}{Asset_{i,t-1}} + \rho_5 \frac{PPE_{i,t}}{Asset_{i,t-1}} + \epsilon_{i,t} \quad (7)$$

where $TCA_{i,j}$ is total current accruals of firm i in year t estimated using the balance sheet approach, calculated as change in current assets – change in current liabilities – change in cash + change in short-term debt ($\Delta ACT_{i,t} - \Delta LCT_{i,t} - \Delta CHE_{i,t} + \Delta DLC_{i,t}$); $CFO_{i,j}$ is firm i's cash flow from operations in year

t, calculated as net income before extraordinary items – total current accruals + depreciation and amortization ($IB_{i,t} - TCA_{i,t} + DP_{i,t}$); $PPE_{i,t}$ is the gross value of property, plant and equipment ($PPEGT_{i,t}$) for firm i in year t; $\Delta Sales_{i,t}$ and $Asset_{i,t}$ are defined as in Eq. (1)-(3). The coefficients are estimated based on the cross-section of all firms in each of Fama and French (1997) 48 industry groups for each year with at least 20 observations for each industry-year. $AQ_{i,t}$ is calculated as the standard deviation of firm i's residuals from Eq. (7) over years t-4 through t. Larger standard deviations of residuals indicate a greater information risk and therefore a poorer AQ.

The results are reported in Table 10. Similar to the results presented in Table 4 and 8, we still document significantly negative coefficients on *Ab.CFO* and *Ab.Disc.Exp* in the interest rate regressions, and a significantly negative coefficient on *Ab.Disc.Exp* and a significantly positive coefficient on *Ab.Prod.Cost* in the PPP metric regressions. These results are consistent with our previous inferences that firms engaging in REM incur higher interest costs and lenders penalise REM activities mainly due to the default risk concerns. Our main conclusions are insensitive to controlling for the effects of AQ.

The coefficients on AQ in the interest rate regressions are consistently positive and significant at the 1% level, indicating that lenders require higher interest rates on firms with a poorer AQ. In the PPP metric regressions, we document a negative relation between AQ and the propensity of choosing accounting ratios as the performance measure. Since AQ is an inverse measure of earnings quality, this finding is consistent with lenders being more likely to trade off more timely accounting ratios for more reliable credit ratings when the borrower is subject to a poorer earnings quality.

7. Conclusion

This study investigates the impact of REM on loan interest rates and PPPs are used to disentangle the sources of this impact. Following prior studies (Roychowdhury, 2006; Cohen et al., 2008; Bartov and Cohen, 2009; Cohen and Zarowin, 2010; Zang, 2011) , we focus on three REM activities, namely

sales manipulation, cutting investments in discretionary expenditures and overproduction. These activities lead to abnormally low CFO, abnormally low discretionary expenditures and abnormally high production costs compared with the industry norm in a specific year.

Using a U.S. loan sample issued during the period Jan 1996 – June 2012, we find that firms with abnormally low CFO and abnormally low discretionary expenditures incur higher interest costs. For loans issued to manufacturing firms, lenders also charge higher interest rates if the borrower has abnormally high production costs. These results are consistent with lenders viewing REM as detrimental to firm value rather than signalling superior future firm performance. Although REM is hard to detect for outside investors, lenders are able to uncover these activities and they require higher compensation for the incremental risk induced by REM. The relation between REM and interest rates is more pronounced as the borrower's leverage ratio increases. Our results are robust to a variety of alternative specifications including restricting the sample to firms that are close to meeting analyst expectations, a 3SLS estimate of other contract terms, the used of raw REM measures and the inclusion of accruals quality as a control variable.

Since REM negatively affects both a firm's earnings quality and future cash flows, we further examine which factor drives lenders' responses to REM by studying the relation between REM and the choice between accounting ratios and credit ratings as the performance measure in PPPs. According to Ball et al. (2008) and Costello and Wittenberg-Moerman (2011), lenders prefer using credit ratings if they believe the borrower's accounting numbers are of poor quality. On the other hand, they prefer using accounting ratios if the borrower is subject to a high default risk. We document that loans issued to firms engaging in REM are more likely to be based on accounting ratios instead of credit ratings, consistent with lenders being more concerned about the incremental default risk induced by REM than the information risk.

This study provides novel evidence on the cost of engaging in REM activities from a lender perspective. Given the critical importance of loan finance to many firms, our finding that lenders

require higher interest rates when the borrower engages in REM serves as a caveat to firms that use REM to boost current period earnings numbers. In addition, this study adds to the literature on PPP. Although the impact of the presence of PPP is often addressed in prior studies (e.g., Beatty et al., 2008; Ivashina, 2009; Demerjian, 2011; Chan et al., 2013), there are very few papers examining the trade-off between accounting ratios and credit ratings as the performance measure in PPPs. We provide insight into how one particular type of earnings management activity, REM, affects this trade-off.

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Appendix A

Definition and Measurement of Variables

Variables	*Definition and Measurement*	*Source of Data*
Test Variables		
Ab.CFO	Abnormal CFO, measured as the error terms from the annual cross-sectional regression model: $\frac{CFO_{i,t}}{Asset_{i,t-1}} = \kappa_0 + \kappa_1 \frac{1}{Asset_{i,t-1}} + \kappa_2 \frac{Sales_{i,t}}{Asset_{i,t-1}} + \kappa_3 \frac{\Delta Sales_{i,t}}{Asset_{i,t-1}} + \epsilon_{i,t}$, where *CFO* is cash flow from operations (*OANCF*); *Sales* is sales revenue (*SALE*); *ΔSales* is change in sales revenue; *Asset* is total assets (*AT*).	Compustat
Ab.Disc.Exp	Abnormal discretionary expenditures, measured as the error terms from the annual cross-sectional regression model: $\frac{Disc.Exp_{i,t}}{Asset_{i,t-1}} = \kappa_0 + \kappa_1 \frac{1}{Asset_{i,t-1}} + \kappa_2 \frac{Sales_{i,t-1}}{Asset_{i,t-1}} + \epsilon_{i,t}$, where *Disc.Exp* is discretionary expenditures, measured as the sum of R&D expense (*XRD*), advertising expense (*XAD*) and selling, general and administrative expenses (*SGA*). Following Roychowdhury (2006), we set missing R&D and advertising to zero as long as SG&A is available; *Sales* and *Asset* are defined as above.	Compustat
Ab.Prod.Cost	Abnormal production costs, measured as the error terms from the annual cross-sectional regression model: $\frac{Prod.Cost_{i,t}}{Asset_{i,t-1}} = \kappa_0 + \kappa_1 \frac{1}{Asset_{i,t-1}} + \kappa_2 \frac{Sales_{i,t}}{Asset_{i,t-1}} + \kappa_3 \frac{\Delta Sales_{i,t}}{Asset_{i,t-1}} + \kappa_4 \frac{\Delta Sales_{i,t-1}}{Asset_{i,t-1}} + \epsilon_{i,t}$, where *Prod.Cost* is production costs, measured as cost of goods sold (*COGS*) plus change in inventory (*INVT*); *Sales, ΔSales* and *Asset* are defined as above.	Compustat
Firm Variables		
σ (ROA)	Standard deviation of ROA estimated over the previous three to five years as available.	Compustat
AQ	Accruals quality, measured as the standard deviation of firm i's residuals over years t-4 to t from annual cross-sectional regressions of the FLOS model (Francis et al., 2005): $\frac{TCA_{i,t}}{Asset_{i,t-1}} = \rho_0 + \rho_1 \frac{CFO_{i,t-1}}{Asset_{i,t-1}} + \rho_2 \frac{CFO_{i,t}}{Asset_{i,t-1}} + \rho_3 \frac{CFO_{i,t+1}}{Asset_{i,t-1}} + \rho_4 \frac{\Delta Sales_{i,t}}{Asset_{i,t-1}} + \rho_5 \frac{PPE_{i,t}}{Asset_{i,t-1}} + \epsilon_{i,t}$, where *TCA* is total current accruals, calculated as change in current assets – change in current liabilities – change in cash + change in short-term debt (*ΔACT – ΔLCT – ΔCHE + ΔDLC*); *CFO* is cash flow from operations measured with the balance sheet approach, calculated as net income before extraordinary items – total current accruals + depreciation and amortization (*IB – TCA + DP*); *PPE* is the gross value of property, plant and equipment (*PPEGT*); *ΔSales* and *Asset* are defined as above.	Compustat
CreRat	The numerical equivalent of S&P, Moody's, Fitch, or DPR senior debt rating. The highest rating is set as 1, through 25 for the lowest rating (excluding suspended and not rated). We first use S&P rating; if a firm is not rated by S&P, we then use the Moody's rating; if a firm is not rated by either S&P or Moody's, we use the Fitch rating; finally, if a firm is not	Compustat/ Mergent FISD

Appendix A

Definition and Measurement of Variables

Variables	*Definition and Measurement*	*Source of Data*
	rated by S&P, Moody's or Fitch, we use the DPR rating. We adopt a conventional conversion scheme to match ratings from all four rating agencies.	
CurRatio	Current ratio, calculated as the ratio of current assets (*ACT*) to current liabilities (*LCT*).	Compustat
Firm Size	Natural logarithm of a firm's total assets (*AT*).	Compustat
IMR	Inverse Mills ratio calculated based on the Probit regression (Zang, 2012): Prob[$Suspect_t = 1$] = $Probit(\gamma_0 + \gamma_1 HabBeater_t + \gamma_2 NumAnalyst_t + \gamma_3 New\ Issue_{t+1} + \gamma_4 Shares_t + \gamma_5 Mar\ to\ Book_{t-1} + \gamma_6 ROA_t + Year\ Effects + \varepsilon_t)$. *Suspect* is an indicator variable equal to one if the firm just meets/beats zero earnings (*IB*), last-year earnings (*IB*) or analyst forecast consensus in a particular year; *HabBeater* is the number of times a firm meeting/beating analysts' forecast consensus in the past four quarters; *NumAnalyst* is the natural logarithm of 1 plus the number of analysts following the firm; *New Issue* is an indicator variable equal to one if the change in log split-adjusted shares outstanding (*CSHO* × *AJEX*) compared with the prior year is greater than 10% (Fama and French, 2008; Greenwood and Hanson, 2012); *Shares* is the natural logarithm of the number of shares outstanding (*CSHO*); *Mar to Book* and *ROA* are defined as below.	Compustat/ IBES
IntCov	Interest coverage rate, measured by the ratio of operating income (*OIBDP - DP*) to interest expense (*XINT*).	Compustat
Leverage	Ratio of long-term debt (*DLTT*) to total assets (*AT*).	Compustat
Mar to book	Ratio of the market value of equity plus the book value of debt (*PRCC* × *CSHO* + *LT*) to total assets (*AT*).	Compustat
ROA	Return on assets, calculated as net income before extraordinary items (*IB*) divided by average assets (*AT*).	Compustat
Tangibility	Ratio of net PPE plus inventory (*PPENT* + *INVT*) to total assets (*AT*).	Compustat
Z-Score	Altman's (1968) Z-score for the likelihood of bankruptcy, computed as (1.2 Working capital + 1.4 Retained earnings + 3.3 EBIT + 0.999 Sales) / Total assets + 0.6 (Market value of equity / Book value of total liabilities) = (1.2 *WCAP* + 1.4 *RE* + 3.3 (*PI* + *XINT* - *IINT*) + 0.999 *SALE*) / *AT* + 0.6 (*PRCC* × *CSHO*) / *LT*.	Compustat
Loan Variables		
Collateral	An indicator variable equal to one if the loan agreement contains collateral requirements and zero otherwise.	DealScan
Indy Collateral	The median collateral of all loans issued by firms within the same Fama and French (1997) industry group and calendar year, used as the instrument for *Collateral* in the 3-SLS analysis.	DealScan
Indy IntSpread	The median interest spreads of all loans issued by firms within the same Fama and French (1997) industry group and calendar year, used as the instrument *for IntSpread* in the 3-SLS analysis.	DealScan
Indy Maturity	The median maturity of all loans issued by firms within the same Fama and French (1997) industry group and calendar year, used as the instrument for *Maturity* in the 3-SLS analysis.	DealScan
InstLoan	An indicator variable equal to one for loans with type of term loan B, C, D, E, F, G or H (institutional term loans) and zero otherwise.	DealScan

Appendix A

Definition and Measurement of Variables

Variables	*Definition and Measurement*	*Source of Data*
IntSpread	Interest spread, measured by All in Spread Drawn (*AISD*) which is the annual spread paid over LIBOR for each dollar drawn down from the loan.	DealScan
Loan Amt	The actual amount of the loan.	DealScan
Loan Purpose	Loans are divided into seven groups according to their primary purpose: acquisition lines, LBO/MBO/SBO, takeover, debt repay/recapitalization, corporate purpose, working capital, and other purposes.	DealScan
Loan Size	Natural logarithm of loan amount.	DealScan
Maturity	Loan maturity in months.	DealScan
PPP_AccNum	An indicator variable equal to one if the performance pricing provision is based on accounting ratios rather than credit ratings and zero otherwise.	DealScan
PPP_Increasing	An indicator variable equal to one if the performance pricing provision leads to an increase in interest spreads when certain thresholds are met and zero otherwise.	DealScan
PPP_Presence	An indicator variable equal to one if the loan agreement contains performance pricing provisions and zero otherwise.	DealScan
Revolver	An indicator variable equal to one for revolving loans and zero otherwise. A revolving loan is a loan with a type of any of the following: "Revolver/Line < 1 Yr.", "Revolver/ Line >= 1 Yr.", "Revolver/Term Loan", "364-Day Facility", "Demand Loan", or "Limited Line".	DealScan

Table 1

Interest Rate Sample Selection Procedure

Selection Procedure	No. of Loans
Dollar-denominated loans issued to US companies in the *DealScan* database up until Mar 2013	125,263
- Loans issued before 1996	(27,141)
- Loans cannot be matched with financial data in *Compustat*	(48,782)
- Loans missing loan terms data	(12,333)
- Loans missing accounting data	(23,557)
- Loans issued to financial or regulated firms	(1,173)
Interest Rate Test Sample	12,277

Table 2
Summary Statistics

Variables	*Mean*	*Std. Dev.*	*25%*	*Median*	*75%*	*N*
Panel A: Interest Rate Sample						
Test Variables						
Ab. CFO	-0.038	0.251	-0.158	-0.032	0.085	12277
Ab. Disc. Exp	-0.079	0.251	-0.210	-0.079	0.030	12277
Ab. Prod. Cost	-0.004	0.306	-0.139	-0.007	0.120	12277
Firm Variables						
Asset ($m)	2948.935	6122.743	227.931	743.044	2489.030	12277
Leverage	0.241	0.196	0.090	0.212	0.347	12277
IntCov	17.765	54.937	1.835	4.487	11.049	12277
CurRatio	1.941	1.128	1.207	1.679	2.370	12277
Mar to Book	1.751	0.990	1.126	1.456	2.015	12277
Tangibility	0.460	0.233	0.283	0.454	0.636	12277
ROA	0.035	0.094	0.007	0.045	0.082	12277
σ (ROA)	0.059	0.067	0.019	0.036	0.072	12277
Z-Score	3.596	2.678	2.046	3.041	4.508	12277
Loan Variables						
IntSpread (bps)	188.138	125.112	87.500	175.000	270.000	12277
Maturity (month)	45.353	21.505	31.000	48.000	60.000	11964
Collateral	0.722	0.448	0.000	1.000	1.000	9426
Loan Amt ($m)	293.311	439.668	45.000	130.000	325.000	12277
InstLoan	0.083	0.276	0.000	0.000	0.000	12277
Revolver	0.728	0.445	0.000	1.000	1.000	12277
PPP_Presence	0.552	0.497	0.000	1.000	1.000	12277
Panel B: PPP Sample						
Test Variables						
Ab. CFO	-0.047	0.236	-0.146	-0.035	0.064	3941
Ab. Disc. Exp	-0.092	0.231	-0.206	-0.085	0.016	3941
Ab. Prod. Cost	-0.006	0.246	-0.122	-0.013	0.094	3941
Firm Variables						
Asset ($m)	5010.644	8594.176	853.203	1942.320	4557.400	3941
Leverage	0.343	0.218	0.193	0.299	0.458	3941
IntCov	6.192	8.573	1.766	3.519	7.228	3941
ROA	0.038	0.066	0.013	0.041	0.073	3941
CreRat	10.928	2.990	9.000	11.000	13.000	3941

Table 2
Summary Statistics

Loan Variables						
PPP_AccNum	0.542	0.498	0.000	1.000	1.000	3941
Loan Amt ($m)	509.450	656.490	125.000	285.000	600.000	3941
InstLoan	0.085	0.279	0.000	0.000	0.000	3941
Revolver	0.767	0.423	1.000	1.000	1.000	3941
PPP_Increasing	0.708	0.455	0.000	1.000	1.000	3941
IntSpread	160.001	102.421	62.500	150.000	250.000	3941

Notes:
The interest rate sample contains 12277 loans issued to 2588 U.S. public firms with an issuance date between January 1996 and June 2012. The PPP sample contains 3941 loans issued to 1031 U.S. public firms with an issuance date between January 1996 and June 2012. Refer to Appendix A for definition and measurement of variables.

Table 3
Pearson Correlation Matrix

Panel A: Interest Rate Sample

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
1 *Ab.CFO*	1.000											
2 *Ab.Disc.Exp*	0.606***	1.000										
3 *Ab.Prod.Cost*	-0.578***	-0.400***	1.000									
4 *IntSpread*	-0.081***	0.024***	0.046***	1.000								
5 *Maturity*	0.003	0.026***	-0.009	0.112***	1.000							
6 *Collateral*	-0.073***	0.025***	0.057***	0.531***	0.115***	1.000						
7 *Asset*	-0.028***	-0.122***	-0.021**	-0.262***	-0.097***	-0.308***	1.000					
8 *Leverage*	-0.036***	-0.024***	0.006	0.213***	0.138***	0.151***	-0.007	1.000				
9 *IntCov*	0.087***	0.032***	-0.119***	-0.104***	-0.014	-0.092***	-0.040***	-0.290***	1.000			
10 *CurRatio*	0.034***	0.017*	-0.058***	-0.027***	0.033***	0.026***	-0.177***	-0.160***	0.238***	1.000		
11 *Mar to Book*	0.161***	0.073***	-0.229***	-0.260***	-0.037***	-0.165***	0.084***	-0.142***	0.301***	0.058***	1.000	
12 *Tangibility*	0.078***	0.104***	0.024***	-0.042***	-0.028***	0.007	-0.008	0.137***	-0.110***	-0.135***	-0.169***	1.000
13 *ROA*	0.123***	0.024***	-0.147***	-0.389***	0.065***	-0.240***	0.083***	-0.183***	0.308***	0.143***	0.344***	-0.025***
14 *σ (ROA)*	0.026***	0.095***	-0.023**	0.293***	-0.046***	0.225***	-0.160***	0.022**	-0.015	0.001	0.113***	-0.098***
15 *Z-Score*	0.106***	0.060***	-0.153***	-0.307***	-0.045***	-0.182***	-0.034***	-0.480***	0.525***	0.436***	0.620***	-0.121***
16 *Loan Amt*	0.010	-0.080***	-0.042***	-0.285***	0.015	-0.312***	0.694***	0.018**	-0.020**	-0.169***	0.113***	0.012
17 *InstLoan*	-0.020**	-0.004	-0.003	0.283***	0.311***	0.183***	-0.037***	0.197***	-0.048***	-0.025***	-0.040***	-0.058***
18 *Revolver*	0.027***	-0.004	0.011	-0.358***	-0.268***	-0.201***	0.075***	-0.149***	0.035***	0.012	0.044***	0.057***
19 *PPP_Presence*	0.010	0.026***	0.019**	-0.164***	0.126***	-0.174***	-0.084***	-0.019**	0.019**	0.032***	-0.007	0.020**

Table 3
Pearson Correlation Matrix

	13	*14*	*15*	*16*	*17*	*18*	*19*
13 *ROA*	1.000						
14 *σ (ROA)*	-0.290***	1.000					
15 *Z-Score*	0.502***	-0.102***	1.000				
16 *Loan Amt*	0.137***	-0.162***	-0.020**	1.000			
17 *InstLoan*	-0.065***	0.043***	-0.113***	0.006	1.000		
18 *Revolver*	0.064***	-0.058***	0.095***	0.069***	-0.493***	1.000	
19 *PPP_Presence*	0.107***	-0.073***	0.049***	0.016*	-0.141***	0.126***	1.000

Panel B: PPP Sample

	1	*2*	*3*	*4*	*5*	*6*	*7*
1 *Ab.CFO*	1.000						
2 *Ab.Disc.Exp*	0.579***	1.000					
3 *Ab.Prod.Cost*	-0.524***	-0.405***	1.000				
4 *PPP_AccNum*	-0.098***	0.006	0.071***	1.000			
5 *Asset*	-0.071***	-0.137***	-0.012	-0.359***	1.000		
6 *Leverage*	-0.032**	0.024	-0.030*	0.403***	-0.203***	1.000	
7 *IntCov*	0.128***	0.019	-0.151***	-0.294***	0.081***	-0.435***	1.000
8 *ROA*	0.160***	0.066***	-0.153***	-0.266***	0.047***	-0.243***	0.501***
9 *CreRat*	-0.123***	0.033**	0.088***	0.735***	-0.432***	0.516***	-0.407***
10 *Loan Amt*	0.002	-0.083***	-0.038**	-0.350***	0.654***	-0.208***	0.167***
11 *InstLoan*	-0.053***	-0.016	0.003	0.177***	-0.060***	0.220***	-0.108***
12 *Revolver*	0.032**	0.001	0.024	-0.177***	0.048***	-0.197***	0.063***
13 *PPP_Increasing*	0.046***	-0.010	-0.017	-0.309***	0.137***	-0.273***	0.158***
14 *IntSpread*	-0.133***	0.004	0.041**	0.613***	-0.217***	0.450***	-0.343***

	8	*9*	*10*	*11*	*12*	*13*	*14*
8 *ROA*	1.000						
9 *CreRat*	-0.376***	1.000					
10 *Loan Amt*	0.154***	-0.405***	1.000				
11 *InstLoan*	-0.075***	0.222***	-0.004	1.000			
12 *Revolver*	0.055***	-0.209***	0.032**	-0.552***	1.000		
13 *PPP_Increasing*	0.153***	-0.321***	0.151***	-0.272***	0.203***	1.000	
14 *IntSpread*	-0.392***	0.688***	-0.275***	0.300***	-0.303***	-0.442***	1.000

Notes:
This table presents the Pearson correlation coefficients among the variables used in regressions. Refer to Appendix A for definition and measurement of variables.
*, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

Table 4

Real Earnings Management and Interest Spreads

		Dependent Variable: IntSpread						
Variables	*Pred. Sign*	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
Intercept		339.435***	338.166***	327.830***	269.147***	-44.622***	-43.910**	-46.467***
		(17.011)	(15.808)	(16.639)	(17.499)	(-2.560)	(-2.452)	(-2.693)
Test Variables								
Ab.CFO	?	-1.472***				-1.666***		
		(-3.341)				(-3.474)		
Ab.Disc.Exp	?		-0.904**				-1.098***	
			(-2.291)				(-2.704)	
Ab.Prod.Cost	?			0.392	1.539***			0.471
				(0.820)	(2.936)			(0.987)
*Ab.CFO * Leverage*	?					-0.475***		
						(-2.762)		
*Ab.Disc.Exp * Leverage*	?						-0.429***	
							(-2.591)	
*Ab.Prod.Cost * Leverage*	?							0.354**
								(2.479)
Control Variables – Firm Characteristics								
Firm Size	-	-17.234***	-17.350***	-17.105***	-16.942***	-17.639***	-17.731***	-17.648***
		(-10.540)	(-10.444)	(-10.375)	(-10.195)	(-10.729)	(-10.655)	(-10.726)
Leverage	+	75.683***	76.179***	76.763***	92.266***	4.367***	4.457***	4.460***
		(8.948)	(8.977)	(9.073)	(7.871)	(8.779)	(9.018)	(9.028)
IntCov	-	0.074***	0.071***	0.072***	0.055	0.080***	0.081***	0.079***
		(2.842)	(2.760)	(2.760)	(1.399)	(3.022)	(3.051)	(2.936)
CurRatio	-	-2.406**	-2.571**	-2.525**	-5.211***	-2.267**	-2.241**	-2.362**
		(-2.203)	(-2.358)	(-2.297)	(-3.445)	(-2.028)	(-2.071)	(-2.163)
Mar to Book	?	-10.299***	-10.835***	-11.016***	-11.235***	-8.786***	-9.385***	-9.462***
		(-5.280)	(-5.625)	(-5.645)	(-4.675)	(-4.530)	(-4.789)	(-4.816)
Tangibility	-	-21.559***	-21.907***	-21.159***	-32.192**	-23.065***	-23.507***	-22.346***
		(-2.784)	(-2.761)	(-2.629)	(-2.509)	(-3.028)	(-2.977)	(-2.768)
ROA	-	-233.738***	-237.635***	-236.018***	-249.936***	-233.637***	-239.139***	-235.236***
		(-15.086)	(-15.328)	(-15.233)	(-12.136)	(-15.579)	(-15.853)	(-15.336)

Table 4

Real Earnings Management and Interest Spreads

		Dependent Variable: IntSpread						
Variables	*Pred. Sign*	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
σ (ROA)	+	191.929***	192.146***	190.167***	216.910***	194.380***	195.156***	192.230***
		(7.120)	(7.199)	(7.081)	(5.858)	(7.503)	(7.600)	(7.356)
Z-Score	-	-2.794***	-2.687***	-2.702***	-0.506	-3.578***	-3.397***	-3.561***
		(-3.321)	(-3.239)	(-3.328)	(-0.443)	(-4.171)	(-4.104)	(-4.272)
Control Variables – Loan Characteristics								
Loan Size	-	-10.643***	-10.669***	-10.654***	-9.330***	-10.521***	-10.515***	-10.472***
		(-6.358)	(-6.425)	(-6.386)	(-4.111)	(-6.316)	(-6.354)	(-6.268)
InstLoan	+	54.014***	53.988***	53.962***	61.692***	55.460***	55.246***	55.759***
		(5.900)	(5.886)	(5.882)	(6.821)	(5.882)	(5.867)	(5.951)
Revolver	-	-45.015***	-45.073***	-45.115***	-41.287***	-45.438***	-45.438***	-45.499***
		(-10.968)	(-10.951)	(-10.979)	(-10.126)	(-11.302)	(-11.309)	(-11.331)
PPP_Presence	-	-17.872***	-17.890***	-18.008***	-16.295***	-18.110***	-18.113***	-18.342***
		(-4.727)	(-4.719)	(-4.806)	(-4.226)	(-4.751)	(-4.767)	(-4.842)
Control for								
Loan Purpose		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes
N		12277	12277	12277	6533	12277	12277	12277
Adjusted R^2		55.690%	55.625%	55.600%	57.681%	55.551%	55.466%	55.409%

Notes:

This table presents the OLS regression results of the effect of REM on interest spreads. In Column 1-4, we regress interest spreads on the REM variables (*Ab.CFO*, *Ab.Disc.Exp, Ab.Prod.Cost)* respectively including a set of firm-specific and loan-specific control variables. The regression results presented in Column 4 are based on the manufacturing-firms sample. The decile ranks of REM variables instead of their raw values are used in these four regressions. In Column 5-7, we add an interaction term between each of the REM variables and firm leverage respectively. The decile ranks of REM variables and leverage instead of their raw values are used and all continuous independent variables are centered by their means in these three regressions.

Cluster (both by firm and by year) and heteroskedasticity adjusted t-statistics are reported in parentheses. All loan variables are estimated at loan initiation and all firm variables are estimated at the end of the fiscal year immediately prior to loan initiation. The extreme values of all variables are winsorized to the 1 and 99 percentiles. Refer to Appendix A for definition and measurement of variables.

*, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

Table 4

Real Earnings Management and Interest Spreads

$$IntSpread = \beta_0 + \beta_1 Ab.CFO/Ab.Disc.Exp/Ab.Prod.Cost + \beta_2 Firm\ Size + \beta_3 Leverage + \beta_4 IntCov + \beta_5 CurRatio + \beta_6 Mar\ to\ Book + \beta_7 Tangibility + \beta_8 ROA + \beta_9 \sigma(ROA) + \beta_{10} Z\text{-}Score + \beta_{11} Loan\ Size + \beta_{12} InstLoan + \beta_{13} Revolver + \beta_{14} PPP\_Presence + Loan\ Purpose\ Effects + Industry\ Effects + Year\ Effects + \varepsilon.$$

$$IntSpread = \gamma_0 + \gamma_1 Ab.CFO/Ab.Disc.Exp/Ab.Prod.Cost + \gamma_2 Ab.CFO/Ab.Disc.Exp/Ab.Prod.Cost * Leverage + \gamma_3 Firm\ Size + \gamma_4 Leverage + \gamma_5 IntCov + \gamma_6 CurRatio + \gamma_7 Mar\ to\ Book + \gamma_8 Tangibility + \gamma_9 ROA + \gamma_{10} \sigma(ROA) + \gamma_{11} Z\text{-}Score + \gamma_{12} Loan\ Size + \gamma_{13} InstLoan + \gamma_{14} Revolver + \gamma_{15} PPP\_Presence + Loan\ Purpose\ Effects + Industry\ Effects + Year\ Effects + \varepsilon.$$

Table 5

Factors Influencing Firms' Likelihood of Meeting/Beating Earnings Benchmarks
(Heckman First Stage)

	Dependent Variable: Suspect	
Variables	*Predicted Sign*	*Coefficient*
Intercept		-1.056***
		(-24.229)
HabBeater	+	0.037***
		(5.450)
NumAnalyst	?	-0.033**
		(-2.067)
New Issue	+	0.003
		(0.099)
Shares	+	0.058***
		(6.593)
Mar to Book	+	0.001
		(0.216)
ROA	?	0.780***
		(12.574)
Year Effects		Yes
N		30,132
Pseudo R^2		1.696%

Notes:
This table presents the Probit regression results on the factors influencing a firm's likelihood of meeting/beating earnings benchmarks. Cluster (both by firm and by year) and heteroskedasticity adjusted z-statistics are reported in parentheses. The extreme values of all variables are winsorized to the 1 and 99 percentiles. Refer to Appendix A for definition and measurement of variables.
*, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

$$Prob[Suspect_{i,t} = 1] = Probit(\gamma_0 + \gamma_1 HabBeater_{i,t} + \gamma_2 NumAnalyst_{i,t} + \gamma_3 New\ Issue_{i,t+1} + \gamma_4 Shares_{i,t} + \gamma_5 Mar\ to\ Book_{i,t-1} + \gamma_6 ROA_{i,t} + Year\ Effects + \varepsilon_{i,t}).$$

Table 6

Real Earnings Management and Interest Spreads – Suspect Sample

(Heckman Second Stage)

	Dependent Variable: IntSpread		
Variables	*(1)*	*(2)*	*(3)*
Intercept	153.640**	150.502**	126.434
	(1.965)	(2.042)	(1.533)
Test Variables			
Ab.CFO	-1.705**		
	(-1.982)		
Ab.Disc.Exp		-1.205	
		(-1.315)	
Ab.Prod.Cost			2.454***
			(3.200)
Control Variables – Firm Characteristics			
Firm Size	-12.566***	-12.698***	-12.676***
	(-3.935)	(-4.005)	(-4.016)
Leverage	127.483***	127.171***	128.227***
	(6.738)	(6.597)	(6.520)
IntCov	0.053	0.048	0.056
	(1.116)	(1.021)	(1.187)
CurRatio	-3.224	-3.244	-3.022
	(-1.340)	(-1.344)	(-1.250)
Mar to Book	-9.845**	-10.317**	-8.775*
	(-2.118)	(-2.139)	(-1.898)
Tangibility	-3.683	-6.027	-5.677
	(-0.306)	(-0.495)	(-0.474)
ROA	-147.886**	-151.560**	-140.785**
	(-2.231)	(-2.326)	(-2.125)
σ (ROA)	205.145***	201.660***	200.891***
	(3.162)	(3.051)	(3.094)
Z-Score	1.904	1.854	1.711
	(1.196)	(1.141)	(1.099)
IMR	93.322*	95.984*	96.426*
	(1.782)	(1.846)	(1.835)
Control Variables – Loan Characteristics			
Loan Size	-15.252***	-15.164***	-15.369***
	(-4.252)	(-4.276)	(-4.376)
InstLoan	62.330***	62.078***	61.697***
	(5.571)	(5.540)	(5.643)
Revolver	-30.285***	-30.595***	-30.479***
	(-5.412)	(-5.458)	(-5.352)
PPP_Presence	-5.393**	-5.443**	-5.971**
	(-2.065)	(-2.101)	(-2.457)
Control for			
Loan Purpose	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes
N	1666	1666	1666
Adjusted R^2	61.733%	61.643%	61.909%

Notes:

This table presents the OLS regression results of the effect of REM on interest spreads based on the suspect sample. Cluster (both by firm and by year) and heteroskedasticity adjusted t-statistics are reported in parentheses. All loan

Table 6

Real Earnings Management and Interest Spreads – Suspect Sample

(Heckman Second Stage)

variables are estimated at loan initiation and all firm variables are estimated at the end of the fiscal year immediately prior to loan initiation. The extreme values of all variables are winsorized to the 1 and 99 percentiles. The decile ranks of REM variables (*Ab.CFO, Ab.Disc.Exp, Ab.Prod.Cost)* instead of their raw values are used in the regressions. Refer to Appendix A for definition and measurement of variables.

*, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

$$IntSpread = \beta_0 + \beta_1\, Ab.CFO/\, Ab.Disc.Exp/\, Ab.Prod.Cost + \beta_2\, Firm\ Size + \beta_3\, Leverage + \beta_4\, IntCov + \beta_5\, CurRatio + \beta_6\, Mar\ to\ Book + \beta_7\, Tangibility + \beta_8\, ROA + \beta_9\, \sigma(ROA) + \beta_{10}\, Z\text{-}Score + \beta_{11}\, IMR + \beta_{12}\, Loan\ Size + \beta_{13}\, InstLoan + \beta_{14}\, Revolver + \beta_{15}\, PPP\_Presence + Loan\ Purpose\ Effects + Industry\ Effects + Year\ Effects + \varepsilon.$$

Table 7
3-SLS Estimation of the Loan Contract Terms

	IntSpread			*Maturity*			*Collateral*		
Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Intercept	301.868***	300.338***	290.131***	11.197*	11.024*	12.957**	0.735***	0.701***	0.650***
	(9.798)	(9.861)	(9.857)	(1.946)	(1.928)	(2.341)	(6.446)	(6.146)	(5.743)
Test Variables									
Ab.CFO	-1.439***			0.179**			-0.007***		
	(-3.702)			(2.457)			(-5.050)		
Ab.Disc.Exp		-0.731**			0.129*			-0.001	
		(-1.990)			(1.791)			(-0.613)	
Ab.Prod.Cost			0.305			-0.104			0.008***
			(0.815)			(-1.432)			(5.719)
Control Variables – Firm Characteristics									
Firm Size	-19.652***	-19.851***	-19.453***	-1.962***	-1.918***	-1.982***	-0.076***	-0.076***	-0.076***
	(-8.612)	(-8.677)	(-8.569)	(-5.225)	(-5.088)	(-5.315)	(-10.687)	(-10.644)	(-10.675)
Leverage	79.965***	80.984***	80.801***	4.262***	4.153***	4.171***	0.200***	0.206***	0.203***
	(9.823)	(9.838)	(9.879)	(2.843)	(2.747)	(2.768)	(6.604)	(6.773)	(6.694)
IntCov	0.055***	0.051***	0.051***	-0.007*	-0.007*	-0.007*	0.000	0.000	0.000
	(2.745)	(2.572)	(2.582)	(-1.800)	(-1.694)	(-1.756)	(-0.444)	(-0.686)	(-0.415)
CurRatio	-2.721***	-2.856***	-2.825***	0.259	0.274	0.267	0.007*	0.007	0.008*
	(-2.650)	(-2.778)	(-2.752)	(1.239)	(1.311)	(1.271)	(1.763)	(1.595)	(1.804)
Mar to Book	-11.397***	-11.983***	-12.074***	-0.501	-0.448	-0.462	-0.028***	-0.032***	-0.027***
	(-6.857)	(-7.029)	(-7.260)	(-1.572)	(-1.384)	(-1.440)	(-4.379)	(-5.005)	(-4.196)
Tangibility	-21.387***	-21.607***	-21.057***	-0.259	-0.185	-0.186	-0.015	-0.013	-0.024
	(-3.868)	(-3.888)	(-3.777)	(-0.233)	(-0.165)	(-0.166)	(-0.674)	(-0.557)	(-1.067)
ROA	-201.379***	-205.532***	-203.005***	13.519***	13.999***	13.593***	-0.118*	-0.135*	-0.108
	(-13.575)	(-13.556)	(-13.742)	(4.085)	(4.196)	(4.077)	(-1.724)	(-1.952)	(-1.569)
σ (ROA)	151.328***	151.700***	148.923***	-16.612***	-16.696***	-16.370***	0.231***	0.225***	0.220***
	(8.355)	(8.359)	(8.307)	(-4.741)	(-4.762)	(-4.691)	(3.209)	(3.114)	(3.065)
Z-Score	-2.343***	-2.249***	-2.240***	-0.003	-0.014	-0.010	-0.002	-0.001	-0.002
	(-3.439)	(-3.305)	(-3.291)	(-0.021)	(-0.100)	(-0.070)	(-0.574)	(-0.370)	(-0.589)
Control Variables – Loan Characteristics									
Loan Size	-4.290**	-4.367**	-4.233**	3.815***	3.819***	3.816***	-0.008	-0.008	-0.007
	(-2.357)	(-2.387)	(-2.331)	(15.385)	(15.388)	(15.386)	(-1.072)	(-1.060)	(-1.038)

Table 7

3-SLS Estimation of the Loan Contract Terms

	IntSpread			*Maturity*			*Collateral*		
Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
InstLoan	56.868***	56.865***	56.727***	13.259***	13.238***	13.287***	0.096***	0.096***	0.096***
	(8.550)	(8.538)	(8.530)	(14.183)	(14.154)	(14.249)	(3.400)	(3.398)	(3.415)
Revolver	-51.901***	-51.841***	-51.974***	-7.527***	-7.541***	-7.517***	0.023	0.023	0.022
	(-13.998)	(-13.935)	(-14.022)	(-10.627)	(-10.651)	(-10.602)	(1.246)	(1.212)	(1.200)
PPP_Presence	-27.860***	-27.954***	-27.811***	6.404***	6.396***	6.423***	0.004	0.004	0.004
	(-8.674)	(-8.666)	(-8.656)	(11.352)	(11.339)	(11.379)	(0.277)	(0.268)	(0.253)
IntSpread				0.003	0.003	0.004	0.001***	0.001***	0.001***
				(0.260)	(0.228)	(0.273)	(6.081)	(6.036)	(6.117)
Maturity	-0.942***	-0.933***	-0.955***				0.001	0.001	0.001
	(-2.730)	(-2.688)	(-2.773)				(0.640)	(0.613)	(0.576)
Collateral	-2.417	-3.762	-1.247	7.128*	7.407**	7.000*			
	(-0.124)	(-0.193)	(-0.065)	(1.911)	(1.989)	(1.885)			
Indy IntSpread	0.434***	0.435***	0.433***						
	(15.412)	(15.410)	(15.380)						
Indy Maturity				0.339***	0.338***	0.340***			
				(14.257)	(14.215)	(14.292)			
Indy Collateral							0.224***	0.225***	0.225***
							(12.820)	(12.804)	(12.889)
Control for									
Loan Purpose	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	9027	9027	9027	9027	9027	9027	9027	9027	9027
Adjusted R^2	52.263%	52.034%	52.289%	33.666%	33.599%	33.649%	41.159%	40.968%	41.174%

Notes:

This table reports the results of 3-SLS system of equations treating interest spreads, maturity and collateral requirement as endogenous variables. *Indy IntSpread, Indy Maturity* and *Indy Collateral* are used as the instruments for these variables respectively. Z-statistics are reported in parentheses. All loan variables are estimated at loan initiation and all firm variables are estimated at the end of the fiscal year immediately prior to loan initiation. The extreme values of all variables are winsorized to the 1 and 99 percentiles. The decile ranks of REM variables (*Ab.CFO*, *Ab.Disc.Exp, Ab.Prod.Cost)* instead of their raw values are used in the regressions. Refer to Appendix A for definition and measurement of variables.

Table 7

3-SLS Estimation of the Loan Contract Terms

*, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

$$IntSpread = \beta_0 + \beta_1\, Ab.CFO/\,Ab.Disc.Exp/\,Ab.Prod.Cost + \beta_2\, Firm\ Size + \beta_3\, Leverage + \beta_4\, IntCov + \beta_5\, CurRatio + \beta_6\, Mar\ to\ Book + \beta_7\, Tangibility + \beta_8\, ROA + \beta_9\, \sigma(ROA) + \beta_{10}\, Z\text{-}Score + \beta_{11}\, Loan\ Size + \beta_{12}\, InstLoan + \beta_{13}\, Revolver + \beta_{14}\, PPP\_Presence + \beta_{15}\, Maturity + \beta_{16}\, Collateral + \beta_{17}\, Indy\ IntSpread + Loan\ Purpose\ Effects + Industry\ Effects + Year\ Effects + \varepsilon.$$

$$Maturity = \gamma_0 + \gamma_1\, Ab.CFO/\,Ab.Disc.Exp/\,Ab.Prod.Cost + \gamma_2\, Firm\ Size + \gamma_3\, Leverage + \gamma_4\, IntCov + \gamma_5\, CurRatio + \gamma_6\, Mar\ to\ Book + \gamma_7\, Tangibility + \gamma_8\, ROA + \gamma_9\, \sigma(ROA) + \gamma_{10}\, Z\text{-}Score + \gamma_{11}\, Loan\ Size + \gamma_{12}\, InstLoan + \gamma_{13}\, Revolver + \gamma_{14}\, PPP\_Presence + \gamma_{15}\, IntSpread + \gamma_{16}\, Collateral + \gamma_{17}\, Indy\ Maturity + Loan\ Purpose\ Effects + Industry\ Effects + Year\ Effects + v.$$

$$Collateral = \kappa_0 + \kappa_1\, Ab.CFO/\,Ab.Disc.Exp/\,Ab.Prod.Cost + \kappa_2\, Firm\ Size + \kappa_3\, Leverage + \kappa_4\, IntCov + \kappa_5\, CurRatio + \kappa_6\, Mar\ to\ Book + \kappa_7\, Tangibility + \kappa_8\, ROA + \kappa_9\, \sigma(ROA) + \kappa_{10}\, Z\text{-}Score + \kappa_{11}\, Loan\ Size + \kappa_{12}\, InstLoan + \kappa_{13}\, Revolver + \kappa_{14}\, PPP\_Presence + \kappa_{15}\, IntSpread + \kappa_{16}\, Maturity + \kappa_{17}\, Indy\ Collateral + Loan\ Purpose\ Effects + Industry\ Effects + Year\ Effects + \omega.$$

Table 8

Real Earnings Management and the Metric of Performance Pricing Provisions

		Dependent Variable: PPP_AccNum		
Variables	*Pred. Sign*	*(1)*	*(2)*	*(3)*
Intercept		-1.296	-1.187	-1.775**
		(-1.432)	(-1.258)	(-1.972)
Test Variables				
Ab.CFO	?	-0.026		
		(-1.584)		
Ab.Disc.Exp	?		-0.045***	
			(-2.578)	
Ab.Prod.Cost	?			0.049***
				(3.896)
Control Variables – Firm Characteristics				
Firm Size	-	-0.326***	-0.334***	-0.328***
		(-3.949)	(-3.984)	(-3.898)
Leverage	+	-0.275	-0.291	-0.225
		(-0.743)	(-0.777)	(-0.596)
IntCov	-	0.000	0.001	0.001
		(0.050)	(0.076)	(0.160)
ROA	-	0.376	0.388	0.478
		(0.392)	(0.396)	(0.497)
CreRat	+	0.387***	0.391***	0.388***
		(6.714)	(6.780)	(6.639)
Control Variables – Loan Characteristics				
Loan Size	-	-0.098	-0.098	-0.100
		(-1.440)	(-1.450)	(-1.496)
InstLoan	+	-0.417*	-0.416*	-0.418*
		(-1.897)	(-1.914)	(-1.852)
Revolver	?	0.070	0.075	0.067
		(0.614)	(0.663)	(0.574)
PPP_Increasing	-	-0.054	-0.044	-0.047
		(-0.507)	(-0.422)	(-0.449)
IntSpread	+	0.004***	0.004***	0.004***
		(3.179)	(3.243)	(3.195)
Control for				
Loan Purpose		Yes	Yes	Yes
Industry Effects		Yes	Yes	Yes
Year Effects		Yes	Yes	Yes
N		3941	3941	3941
Psuedo R^2		61.053%	61.198%	61.297%

Notes:

This table presents the Probit regression results of the effect of REM on the propensity of choosing accounting-based performance pricing provisions. Cluster (both by firm and by year) and heteroskedasticity adjusted z-statistics are reported in parentheses. All loan variables are estimated at loan initiation and all firm variables are estimated at the end of the fiscal year immediately prior to loan initiation. The extreme values of all variables are winsorized to the 1 and 99 percentiles. The decile ranks of REM variables (*Ab.CFO*, *Ab.Disc.Exp, Ab.Prod.Cost)* instead of their raw values are used in the regressions. Refer to Appendix A for definition and measurement of variables.

*, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

$$Prob[PPP\_AccNum = 1] = Probit(\kappa_0 + \kappa_1 Ab.CFO/Ab.Disc.Exp/Ab.Prod.Cost + \kappa_2 Firm\ Size + \kappa_3 Leverage + \kappa_4 IntCov + \kappa_5 ROA + \kappa_6 CreRat + \kappa_7 Loan\ Size + \kappa_8 InstLoan + \kappa_9 Revolver + \kappa_{10} PPP\_Increasing + \kappa_{11} IntSpread + Loan\ Purpose\ Effects + Industry\ Effects + Year\ Effects + \varepsilon).$$

Table 9

Robustness Test – Using the Raw Values of REM Variables

	IntSpread			*PPP_AccNum*		
Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Intercept	330.014***	330.329***	329.652***	-1.493	-1.536*	-1.531*
	(16.739)	(16.584)	(16.775)	(-1.630)	(-1.679)	(-1.676)
Test Variables						
Ab.CFO	-10.875**			-0.228		
	(-2.369)			(-1.259)		
Ab.Disc.Exp		-3.470			-0.556***	
		(-0.642)			(-2.606)	
Ab.Prod.Cost			-0.369			0.378**
			(-0.086)			(2.141)
Control Variables – Firm Characteristics						
Firm Size	-17.126***	-17.145***	-17.055***	-0.321***	-0.328***	-0.318***
	(-10.363)	(-10.348)	(-10.330)	(-3.801)	(-3.839)	(-3.748)
Leverage	76.019***	76.653***	76.862***	-0.274	-0.301	-0.257
	(9.009)	(9.048)	(9.069)	(-0.743)	(-0.834)	(-0.683)
IntCov	0.074***	0.071***	0.071***	0.000	0.001	0.001
	(2.786)	(2.737)	(2.701)	(0.009)	(0.110)	(0.084)
CurRatio	-2.438**	-2.587**	-2.578**			
	(-2.216)	(-2.365)	(-2.321)			
Mar to Book	-10.687***	-11.181***	-11.347***			
	(-5.390)	(-5.773)	(-5.794)			
Tangibility	-20.955***	-20.893***	-20.452***			
	(-2.700)	(-2.640)	(-2.574)			
ROA	-234.972***	-237.299***	-237.261***	0.370	0.403	0.395
	(-15.110)	(-15.364)	(-15.213)	(0.390)	(0.416)	(0.417)
σ (ROA)	191.516***	191.080***	190.034***			
	(7.156)	(7.156)	(7.065)			
Z-Score	-2.785***	-2.664***	-2.663***			
	(-3.308)	(-3.270)	(-3.287)			
CreRat				0.388***	0.393***	0.388***
				(6.745)	(7.022)	(6.737)

Table 9

Robustness Test – Using the Raw Values of REM Variables

	IntSpread			*PPP_AccNum*		
Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Control Variables – Loan Characteristics						
Loan Size	-10.692***	-10.676***	-10.671***	-0.099	-0.102	-0.102
	(-6.419)	(-6.414)	(-6.408)	(-1.460)	(-1.505)	(-1.526)
InstLoan	54.063***	54.033***	53.999***	-0.412*	-0.409*	-0.415*
	(5.900)	(5.885)	(5.872)	(-1.881)	(-1.859)	(-1.860)
Revolver	-45.014***	-45.070***	-45.070***	0.075	0.081	0.073
	(-10.961)	(-10.935)	(-10.959)	(0.656)	(0.706)	(0.621)
PPP_Presence	-17.945***	-17.935***	-17.968***			
	(-4.767)	(-4.736)	(-4.799)			
PPP_Increasing				-0.056	-0.051	-0.054
				(-0.521)	(-0.497)	(-0.510)
IntSpread				0.004***	0.004***	0.004***
				(3.167)	(3.272)	(3.205)
Control for						
Loan Purpose	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	12277	12277	12277	3941	3941	3941
Adjusted R^2/ Psuedo R^2	55.635%	55.597%	55.593%	61.012%	61.219%	61.121%

Notes:

This table reports the results of the robustness tests using raw values of REM variables (*Ab.CFO, Ab.Disc.Exp, Ab.Prod.Cost)*. Cluster (both by firm and by year) and heteroskedasticity adjusted t-statistics/z-statistics are reported in parentheses. All loan variables are estimated at loan initiation and all firm variables are estimated at the end of the fiscal year immediately prior to loan initiation. The extreme values of all variables are winsorized to the 1 and 99 percentiles. Refer to Appendix A for definition and measurement of variables.

*, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

Table 10

Robustness Test – Controlling for AQ

	IntSpread			*PPP_AccNum*		
Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Intercept	307.880***	308.931***	297.970***	-1.026	-1.013	-1.542
	(14.479)	(13.380)	(14.243)	(-1.067)	(-0.972)	(-1.556)
Test Variables						
Ab.CFO	-1.228**			-0.026		
	(-2.194)			(-1.394)		
Ab.Disc.Exp		-1.078**			-0.034*	
		(-2.236)			(-1.646)	
Ab.Prod.Cost			0.233			0.064***
			(0.478)			(3.876)
Control Variables – Firm Characteristics						
AQ	2.921***	3.047***	3.052***	-0.033*	-0.030*	-0.037**
	(4.919)	(5.171)	(5.158)	(-1.906)	(-1.721)	(-2.067)
Firm Size	-15.587***	-15.721***	-15.387***	-0.425***	-0.428***	-0.433***
	(-8.226)	(-8.138)	(-8.029)	(-4.671)	(-4.538)	(-4.485)
Leverage	76.736***	77.177***	77.804***	-0.355	-0.354	-0.245
	(7.631)	(7.641)	(7.725)	(-0.678)	(-0.674)	(-0.439)
IntCov	0.057***	0.055***	0.055***	0.005	0.005	0.007
	(2.640)	(2.580)	(2.581)	(0.563)	(0.538)	(0.737)
CurRatio	-2.333*	-2.493**	-2.462**			
	(-1.920)	(-2.067)	(-2.032)			
Mar to Book	-11.369***	-11.671***	-12.086***			
	(-4.638)	(-4.906)	(-5.092)			
Tangibility	-16.707*	-17.278*	-15.932*			
	(-1.806)	(-1.850)	(-1.679)			
ROA	-228.743***	-231.999***	-231.086***	-0.480	-0.505	-0.284
	(-12.687)	(-12.777)	(-12.954)	(-0.487)	(-0.509)	(-0.271)
σ (ROA)	175.610***	174.593***	172.211***			
	(6.251)	(6.208)	(6.084)			
Z-Score	-2.888***	-2.815***	-2.803***			
	(-3.075)	(-2.980)	(-3.077)			

Table 10

Robustness Test – Controlling for AQ

	IntSpread			*PPP_AccNum*		
Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
CreRat				0.437***	0.439***	0.439***
				(6.935)	(7.000)	(6.786)
Control Variables – Loan Characteristics						
Loan Size	-10.710***	-10.743***	-10.728***	-0.060	-0.060	-0.065
	(-5.846)	(-5.912)	(-5.873)	(-0.801)	(-0.816)	(-0.872)
InstLoan	56.159***	56.195***	56.133***	-0.465**	-0.459**	-0.466**
	(5.861)	(5.848)	(5.847)	(-2.312)	(-2.306)	(-2.236)
Revolver	-44.688***	-44.749***	-44.773***	0.095	0.097	0.085
	(-11.424)	(-11.424)	(-11.423)	(0.778)	(0.801)	(0.675)
PPP_Presence	-16.944***	-16.872***	-16.998***			
	(-5.072)	(-5.031)	(-5.142)			
PPP_Increasing				-0.221**	-0.212**	-0.205**
				(-2.352)	(-2.272)	(-2.148)
IntSpread				0.004**	0.004**	0.004**
				(2.485)	(2.524)	(2.501)
Control for						
Loan Purpose	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	10293	10293	10293	3152	3152	3152
Adjusted R^2/ Psuedo R^2	57.237%	57.217%	57.174%	62.561%	62.608%	63.010%

Notes:

This table reports the results of the robustness tests controlling for the effects of AQ. Cluster (both by firm and by year) and heteroskedasticity adjusted t-statistics/z-statistics are reported in parentheses. All loan variables are estimated at loan initiation and all firm variables are estimated at the end of the fiscal year immediately prior to loan initiation. The extreme values of all variables are winsorized to the 1 and 99 percentiles. The decile ranks of REM variables (*Ab.CFO*, *Ab.Disc.Exp, Ab.Prod.Cost)* and AQ instead of their raw values are used in the regressions. Refer to Appendix A for definition and measurement of variables.

*, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).