






## Article

# The Interplay of Leverage, Financing Constraints and Real Earnings Management: A Panel Data Approach

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**Abstract:** Organizations are formed to gain long-term benefits. However, sometimes myopic management for feigned value enhancement led to the early demise of the firm. Further, to the best of our knowledge empirical role of financing constraints has not yet been explored between the relationship of leverage and earnings management practices. Therefore, the present study aims to empirically examine the impact of leverage on Real Earnings Management (REM) practices and how financing constraints influence this association. Employs a panel dataset of 3250 non-financial Chinese listed firms for a time period spanning from 2009 to 2018. Leverage is categorized into short-term, long-term, and total leverage to check the individual effects of each leverage category on REM practices. The data were analyzed through panel data fixed-effects and random-effects techniques as an econometric approach. First, consistent with positive accounting theory, the impact of total leverage on REM is positive. Second, compared to the long-term leverage, short-term leverage has more pronounced effects on managers' opportunistic behavior towards using REM. Third, the influence of total leverage is higher (lower) on REM practices in financially unconstrained (constrained) firms. Fourth, the influence of short-term leverage on REM practices compared to long-term leverage is also weak in the financially constrained firms. These findings imply that, to avoid the consequences of managerial myopia, investors should abstain to invest in the firms that use higher amount of short-term debt and are financially unconstrained. This study is the first research to examine the impact of different leverage categories on REM practices in an emerging market, i.e., China, where the legal and financial structure is much poor.

**Keywords:** leverage; real earnings management; financing constraints; panel data



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## 1. Introduction

Earnings Management (EM, hereafter) involve managers attempt to manipulate the earnings level by employing multiple accounting tactics to achieve short-term objectives (Almutairi 2021; Haga et al. 2021). EM can negatively affect customers, employees, shareholders, accounting professionals, lenders, and led to demise of the organization as demonstrated by Satyam computer services, WorldCom, and Enron's debacle (Hickman et al. 2020; Lara et al. 2020). Still, firm managers have extensive motivation to fabricate the earnings opportunistically, but factors that attract managers towards EM practices remain an important research question in the literature (Hickman et al. 2020).

How much a firm can obtain from creditors depends on how much information is provided to them. Considering that the number of leverage disciplines the managers, the relationship between financial leverage and EM is dynamic. [Leuz et al. \(2003\)](#) suggested that “... insiders in attempt to protect their private control benefits, use EM to conceal firms’ performance from outsiders”. Based on trade-off theory, [Kraus and Litzenberger \(1973\)](#) and [Lazzem and Jilani \(2018\)](#) argued that an optimal amount of leverage is based upon the trade-off between cost and benefits of debt. Benefits include the reduction in agency conflicts between firm agents and owners, whereas cost includes bankruptcy potentials. [Qi et al. \(2021\)](#) agency problems can diminish by dampening asymmetric information issues, a major factor leading to EM practices. Additionally, positive accounting theory has shown the primary incentives for EM, such as compensation contract of management, political costs, and debt covenants. Thus, debt contracts and opportunistic earnings smoothness indicate the accessible linkage between leverage and EM practices. In such a scenario, different researchers tested this relationship and offered mixed outcomes. On one side, some studies have documented the positive impact of leverage on EM practices ([Kalgo et al. 2019](#); [Lazzem and Jilani 2018](#); [Mendoza et al. 2020](#); [Tulcanaza-Prieto et al. 2020](#)). On the other side, some studies have reported a negative association between leverage and EM practices ([Qin 2020](#); [Zamri et al. 2013](#)). [Lazzem and Jilani \(2018\)](#) argued that these differences in the outcomes of the relationship between leverage and EM practices could be explained by countries’ legal systems. Consequently, contradicting empirical outcomes and theoretical debate highlights the importance and complexity of this theme.

Further, considerable prior studies have shown the importance of financing constraints for managers in decision-making processes. [Farrell et al. \(2014\)](#) have documented that financing constraints play an essential role in investment and capital structure decisions. In [Myers and Majluf \(1984\)](#) and [Khan et al. \(2017\)](#), both studies suggested that financing constraints prevail because of information asymmetry between managers and owners, which leads to the higher cost for constrained firms in terms of interest rate at the time of obtaining a loan from creditors. Constrained firms’ managers are expected to be more involved in EM practices than unconstrained firms ([Kurt 2018](#)). It suggests that by diminishing the asymmetric information problem and improving information quality, firms’ can reduce both financing cost and financing constraints, which possibly discourages the managers from engaging in the fabrication of cash-flows. Considering the importance of these two strands of corporate finance, the role of financing constraints in the relationship between leverage and EM is largely ignored. Therefore, the present research endeavors fill this gap by explicitly considering the role of financing constraints in the relationship between leverage and EM practices. The novelty of this study lies in the fact that leverage is categorized into three categories, i.e., short-term, long-term, and total leverage, to check the impact of each leverage category on opportunistic behavior of managers toward the REM practices, which is fairly a new topic in the literature. Finally, we also empirically investigate whether the financing constraints influenced the relationship between leverage and REM practices.

Present study makes several novel contributions to the body of literature. First, the present research extends the theoretical and empirical literature of EM by documenting the role of leverage in managers’ behavior towards REM practices. Second, this study is entirely distinctive from all previous conventional research because it focuses on a single country instead of comparing cross-countries, which might ignore individuality among economies. Finally, this study will be beneficial for regulatory bodies to improve their accountings standards, which ultimately discourage the fabrication of earnings.

The study has become more interesting because we chose China for this title due to its unique financial and government system compared to the rest of the world. The Chinese economy not only plays a vital role in the global economy, but is also the 2nd biggest economy of the world at the end of 2020, when it attained up to USD 14.34 trillion of nominal GDP, and economic experts forecasted that China will attain the level of world’s biggest economy in next decade. Despite all of these hallmarks, the Chinese economy faces

some internal complications such as the financial system, and the legal structure of the Chinese economy is not as developed as other developed countries, such as the United Kingdom and the United States (Khan et al. 2017), which makes the present study much more influential and interesting. Noronha et al. (2008) argued that the lack of developed accounting regulations badly affects the firm information quality in China. Further, China is a country where the local government gives a subsidy to facilitate the state owned-enterprises to fulfill the regulatory requirements of the central government. Hence, in China, listed firms are much involved in EM practices to meet the central government's benchmark (Hussain et al. 2020). Further, in China, the regulatory system is crude, and many accounting regulations are still not regulated (Noronha et al. 2008). They also argued that the lack of developed accounting regulations has negative effects on the firm's information quality and, that is why EM is considered very common in this mainland. Additionally, Chinese firms have multiple and concentrated ownership structures, while Guo and Ma (2015) contended that concentrated ownership raising the manipulation of activities in Chinese listed firms. Additionally, Cang et al. (2014) argued that in Chinese quoted firms', analysts impose the pressure on managers and also set the tough targets for firm managers, which, in turn, ultimately pursue the managers to fabricate the earnings level by utilizing the REM activities to meet the analysts' benchmark. Therefore, we believe that China is an interesting case study for this title.

The remaining portion of this article proceeds as follows: Section 2 formulate the hypothesis based on literature; research methodology and empirical measures that we use to test the hypothesis is described in Section 3; Section 4 shows the econometric approach along with univariate and multivariate analysis and; final section concludes the entire study.

## 2. Related Research and Hypothesis Development

### 2.1. Earnings Management

According to Healy and Wahlen (1999), "... earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers". Based on this definition, hiding information from stakeholders and influencing contract requirements are the critical objectives of EM. Despite this definition being more authentic and acceptable, Dechow and Skinner (2000) also have detected the unobservable phenomena that is the intention of managers behind EM—i.e., hide information from stakeholders. For EM, Dechow and Skinner (2000) prefer to use the definition of National Association of Certified Fraud Examiners (1993), which define the EM as "... the intentional, deliberate, misstatement or omission of material facts, or accounting data, which is misleading and, when considered with all the information made available, would cause the reader to change or alter his or her judgment or decision." However, these two definitions vary but have commonality because both merely rely on intervening in firms' financial data. There are two main motivations to utilize the EM practices benefiting the entity (like avoiding debt covenants and maximizing shareholders' wealth) and benefiting the managers themselves to enhance their remunerations (Alhadab et al. 2020). Managers opportunistically engage in EM activities may through REM or accrual-based Earnings Management activities (AEM, hereafter). Ding et al. (2021) argued that managers manage the real and accrual activities to change the firm's observable performance. Managers undertake the REM activities throughout the fiscal period while undertaking AEM activity is only possible at the end of firms' fiscal period but before the issuance of financial reports to attain the income targets (Hussain et al. 2020). In this study, we employ the REM practices instead of AEM as a proxy of EM.

### 2.2. Why Choose REM?

Graham et al. (2005) argued in their survey report that

“... we find strong evidence that managers take real economic actions to maintain accounting appearances”. (p. 32)

Consistent with this survey, [Roychowdhury \(2006\)](#) empirically proved that managers are involved in reducing discretionary expenditures, overproduction, and aggressive sale manipulation to evade losses and defaults. The choice of REM instead of AEM is also inspired because it is distinguished from the firm normal daily operations, which are often easy to inflate, while investors usually pay attention only to the financial publications of the company to judge the firms' performance. Further, in 2002 when the “business judgment rule” and Sarbanes-Oxley Act were introduced, manager preferences are increased toward REM practices because managers' arbitrary decisions become much complex to detect ([Tulcanaza-Prieto et al. 2020](#)). Likewise, [Pappas et al. \(2019\)](#) claimed that unlike other proxies of EM, detecting the REM practices is relatively difficult for outsiders. Moreover, after the adoption of “International Financial Reporting Standards (IFRS)” manager preferences are also shifting from AEM to REM practices because the implementation of IFRS enhance the legal regime and possibly dampens the direct opportunity for managers to manipulate the earnings by directly altering the financial transactions ([Tulcanaza-Prieto et al. 2020](#)). Because of these all advantages of REM, recently managers prefer to opportunistically utilize the REM practices instead of AEM practices to fabricate their real activities. These are the key factors behind the choice of REM practices in this study as a proxy of EM instead of the other measures of EM.

### 2.3. Hypothesis Development

#### 2.3.1. Leverage and Earnings Management

On one side, instead of the other aspects of accounting information quality REM is an activity that is much hard to detect for lenders. It is much costly for creditors to judge the firms' operating system to identify whether the managers' are deliberately involved in earning manipulation activities. Even, if creditors manage to detect firms' unusual activities then they are not able to interpret them as REM practices. For example, creditors may concern about the aggressive reduction in firms' discretionary expenses as cost-saving. It is also much difficult for creditors to rely on the external monitoring forces to detect REM since REM is unlikely to draw auditors' or regulators' scrutiny ([Pappas et al. 2019](#); [Roychowdhury 2006](#)). On the other side, creditors may possess the firms' private information to detect REM practices, such as after the loan creditor starts the delegated monitoring mechanism on firms to gather firm private information through this monitoring mechanism.

[Zamri et al. \(2013\)](#) documented that the response of leverage to REM practices is negative and significant, which means higher leverage prohibits the managers' involvement towards REM practices in the context of Malaysia. Similarly, consistent with the control hypothesis this kind of negative association is also confirmed by [Esadinia et al. \(2014\)](#) and argued that leverage mitigates the managers' motivation level towards the manipulation of earnings. Further, [Vakilifard and Mortazavi \(2016\)](#) tested the argument that whether the leverage moves the managers' preferences from AEM to REM practices to manage their earnings. Their findings confirmed that once the leverage level increases managers' have much incentive to manage their earnings through REM practices instead of AEM practices. Moreover, [Mellado-Cid et al. \(2017\)](#) examined what type of behavior managers have shown toward the REM activities before the issuance of bonds. They found that firms are more involved in REM practices immediately in quarters before the issuance of bonds to attract investors.

[Anagnostopoulou and Tsekrekos \(2017\)](#) contribute to the literature by hypothesized that highly leveraged firm managers are motivated to choose EM tactics based on trade-off between both methods (AEM and REM). Their outcomes suggested that high leverage turns the substitution effect into a complementary effect between REM and AEM practices. They indicated that a high level of leverage motivates the manager to use both EM tactics simultaneously to attain the targeted earning. Similarly, [Wang et al. \(2018\)](#) examined the

association of external financings with both EM practices by considered the moderating role of Enterprise Risk Management (ERM) in this relationship. Their findings revealed that managers simultaneously used both AEM and REM practices when involving activities related to equity financing. Further, results suggested that in the case of weaker ERM system managers are less likely to use REM practices in their equity financing-related activities. Likewise, they have also documented that in the case of debt financing managers are also motivated to manage their earnings through utilizing the EM practices. [Hoang and Phung \(2019\)](#) investigated the association of leverage and EM practices in the context of Vietnam. They found the same as per the debt covenants hypothesis that leverage pursues the managers to opportunistically utilize the REM practices to hide the actual financial image from investors. Another study documented that sustainable reporting diminish the cost of debt ([Nazir et al. 2022](#)), which may also encourage the managers to artificially make their earnings sustainable for obtaining loans at reasonable cost.

[Tulcanaza-Prieto et al. \(2020\)](#) by employing the data of Korean non-financial listed firms spanning from 2010 to 2018 found that leverage positively affects the REM practices in suspicious firms. Further, by using the sample of 43 worldwide countries [Zhang et al. \(2020\)](#) concluded that REM practices are more pronounced with firms' reliance on debt financings. A concurrent study, [Lassoued \(2021\)](#) also exhibits that managers manage the earnings level for external financing purposes. Moreover, this kind of positive association between leverage and EM practices is also confirmed in the context of Indonesia ([Nalarreason et al. 2019](#)), in context of US firms' ([Chen et al. 2015](#)), in case of Malaysia ([Kalgo et al. 2019](#)), in case of 18 countries data ([Kim et al. 2020](#)) and proved from the sample of Latin American firms ([Mendoza et al. 2020](#)).

In summary, most of the above arguments and findings indicate that the role of leverage towards the use of EM practices is positive. Therefore, formulate the following hypothesis:

**H1.** *For Chinese quoted firms, highly leveraged firms are more likely to undergo REM.*

[Diamond \(2004\)](#) claimed that creditor enforcement plays a key role in debt contracts and this becomes severe in case of debtors' misbehavior, thus inducing the creditors' enforcement managers to add short-term debt in the capital structure. To empirically test this argument, [Gupta et al. \(2008\)](#) examined whether the short-term debt gives incentive to the debtor to hide the occurrence of bad news through earnings fabrication or not. They have proven the same, as per the notion of [Diamond \(2004\)](#) that short-term debt pursues the debtors to manage their earnings to hide consequences of bad news on the company. They also highlighted that, especially in countries where the legal system is weak, the role of short-term debt towards EM is much more pronounced and vice versa.

Moreover, [Fung and Goodwin \(2013\)](#) argued that, in accordance with the theory of financial distress, debt has a positive impact on EM, and they claimed that most of the prior literature has shown that firms' whose credit rating is strong on which short-term debt providers (lenders) have key control over the monitoring of management. Therefore, to test these assumptions study measures the relationship between short-term debt and EM practices. Consistent with financial distress theory, they found that in firms whose credit rating is low the short-term debt has a positive impact on EM in the context of US quoted firms ([Fung and Goodwin 2013](#)). In addition, [Fields et al. \(2018\)](#) examined the association between refinancing pressure and EM practices. The purpose behind this is to investigate whether the managerial behavior is changed towards EM in case of both short-term debts and at the time when a company goes to obtain new loans. They brought together the two different standards (short-term debt and obtaining a new loan) in order to explore the linkage between refinancing pressure and EM practices. They concluded that managers are much more likely to involve EM practices in cases of using more short-term debt. They also exposed that at the time when debt is near to maturing and managers perceived from the market that there are some hurdles for obtaining a new loan then they have more incentive to make strong financial health of the company through manipulation in activities.

Moreover, [Gupta and Fields \(2006\)](#) examined how much managers have incentive towards the utilization of EM practices in case if the current debt is more included in firms' capital structure. Their main estimated results are; (1) more the short-term debt leads to more utilization of EM practices; (2) this relation is much stronger in the case when firms face debt constraints. Similarly, [Afza and Rashid \(2014\)](#) empirically tested how much diversification and debt level influenced EM practices in the context of Pakistan. They used both short and long-term debt as measures of debt, along with two diversification measures, namely: geographical and industrial diversification. They concluded that in the case of short-term debt managers are much motivated to use EM practices instead of long-term debt. They highlighted that in long-term debt strict monitoring mechanisms diminish the managers' role in EM practices. Additionally, they have also confirmed that both geographical and industrial diversification dampen the managers' involvement toward the EM practices. [Pappas et al. \(2019\)](#) inspected the association of loan contract terms with the propensity of REM practices in the context of US firms'. They have documented that interest spread has a positive and significant association with REM practices. Further, their reported results have also concluded that shorter debt maturities exhibit lower financial reporting quality by employing REM practices. The most recent study, by employing the data of non-financial listed firms of Vietnam, [Liem \(2020\)](#) found that when the debt maturity is shorter managers are much engaged in REM practices. In short, majorly the above literature indicates that short-term leverage facilitates the managers to utilize the REM practices, therefore develop the following hypothesis.

**H2.** *For Chinese quoted firms, short-term leverage causes more REM than long-term leverage does.*

### 2.3.2. Role of Financing Constraints

EM is a very expensive tool and it comprises of a variety risks including audit risk, litigation risk, and risk that is associated with the firms' future performance. However, the reputational issue dampens the aggressive EM practices and a trade-off between cost and advantages at the time when firms obtain additional finances ([Kurt 2018](#)). This issue may be more pronounced in financially constrained firms' because these firms do not have a good reputation in the capital market and also bear the higher cost in terms of the interest rate at the time of obtaining capital from external sources ([Kurt 2018](#)). This gives the signal that, in such a scenario, managers have an incentive to employ EM practices to influence investors' decision to raise the capital at favorable conditions. Further, another study [McNichols and Stubben \(2008\)](#) stated that the firms that are financially constrained and have various positive NPV's project opportunities in that firms' managers are highly motivated to utilize the discretions over accounting figures for obtaining the loan at a lower cost. Similarly, [Kurt \(2018\)](#) contended that managers of financially constrained firms are usually involved in EM practices due to the pressure of the capital market instead of their opportunism. Further, [Linck et al. \(2013\)](#) suggested that discretionary accruals can help the financially constrained firms', because these firms increase the firm value for showing a positive image in front of creditors through playing with accruals. Therefore, managers are motivated to practice the EM activities to artificially upward the earnings. Another study supported the argument that by improving information quality between investor and insider the financing cost and financing constraints can be dampened and credit access can be increased ([Francis et al. 2005](#)). Further, [Liu et al. \(2015\)](#) suggested that managers can decrease their financial obstacles by improving the financial reporting quality. [Elkalla \(2017\)](#) claimed that managers of financially stable firms have not much incentive to utilize REM practices.

Therefore, based on the above arguments, we believe that financially constrained firm managers are much motivated to use their discretions over the day-to-day activities to manage their earnings for obtaining the loan at favorable conditions.

**H3.** *For Chinese quoted firms, total leverage causes more REM in financially constrained firms.*

**H4.** For Chinese quoted financially firms, Short-term leverage cause more REM than long-term leverage does.

### 3. Methodology

#### 3.1. Data

In this use, the secondary data of all non-financial Chinese listed firms spanning from 2009 to 2018. [Hu et al. \(2021\)](#) contended that China update its reporting standards concerned with accounting numbers in 2007, and the measurements of REM practices required lagged values (data from previous year); hence, to make the data comparable, use 2009 as the begging year for the sample. Furthermore, in 2008, “Chinese Security Regulatory Commission” along with four different Chinese ministries jointly issued the Chinese Sarbanes Oxley Act (SOX), which provides an opportunity to firms that they use their own criteria to access a potential deficiency. Therefore, selected sample starts from 2009 as first year in time span of this study. All the data are obtained from Shanghai and Shenzhen stock exchanges. Initially, we collect the data of 3735 listed firms and then exclude the data of financial firms, as well as firms that have consecutive three missing values. Therefore, finally, we can obtain a sample of 3250 Chinese listed firms’ which contains the 27,019 firm-year observations. Further, to resolve the outliers issue, we also winsorize the data at 1% top and bottom level.

#### 3.2. Baseline Empirical Models

To test the nature of the relationship between leverage categories and REM practices and how much financing constraints reshape this relationship, we use the panel regression models where three different REM measures are given by [Roychowdhury \(2006\)](#) namely: REM\_CFO, REM\_PROD, and REM\_DISEXP are treated individually, as well as in combined form as a dependent variable to improve the robustness of outcomes in all equations. [Roychowdhury \(2006\)](#) and [Zamri et al. \(2013\)](#) stated that, to manipulate their earnings, managers’ may take one or all of these three accounting effects: (i) low level of cash-flows from operations unusually arise due to heavy percentage of discounts on sale and offering very relaxed credit conditions to attain the targeted sales volume; (ii) unusually firms increased the production cost to curb the CGS (cost of goods sold), which, in turn, ultimately increases the operating margins for the only current period; and (iii) unusually the low level of discretionary expenses are arises because of the reduction in advertisement expenses, selling, general and administration (SG&A) expenses, and R&D expenditures.

The estimated regressions as follows:

$$REM_{i,t} = \beta_0 + \beta_1 T\_LEV_{i,t} + \beta_2 SFR_{i,t} + \beta_3 NPM_{i,t} + \beta_4 Tangibility_{i,t} + \beta_5 YSTOCKRET_{i,t} + u_{i,t} \quad (1)$$

$$REM_{i,t} = \beta_0 + \beta_1 ST\_LEV_{i,t} + \beta_2 SFR_{i,t} + \beta_3 NPM_{i,t} + \beta_4 Tangibility_{i,t} + \beta_5 YSTOCKRET_{i,t} + u_{i,t} \quad (2)$$

$$REM_{i,t} = \beta_0 + \beta_1 LT\_LEV_{i,t} + \beta_2 SFR_{i,t} + \beta_3 NPM_{i,t} + \beta_4 Tangibility_{i,t} + \beta_5 YSTOCKRET_{i,t} + u_{i,t} \quad (3)$$

Description of all variables are presented in [Table 1](#).

**Table 1.** Variables description and measurements.

Dependent Variable	Description and Measurements
<i>Real EM</i>	The value of real earnings management as a proxy of EM practices, which equals to the regressions residual estimate by using <a href="#">Roychowdhury (2006)</a> model consistent with ( <a href="#">He et al. 2021</a> ; <a href="#">Hussain et al. 2020</a> ). In this use three different measures of REM following <a href="#">Roychowdhury (2006)</a> model, i.e., REM_CFO, REM_PROD, and REM_DISEXP as a proxy of REM practices. Therefore, to enhance robustness of study, employed all of these three metrics individually, as well as in combined form.
(1) <i>REM_CFO</i>	It represents the abnormal cash-flows from operations, which is measured through the following equation: $\frac{CF_{it}}{A_{it-1}} = \beta_1 \left( \frac{1}{A_{it-1}} \right) + \beta_2 \left( \frac{Sales_{it}}{A_{it-1}} \right) + \beta_3 \left( \frac{\Delta Sales_{it}}{A_{it-1}} \right) + u_{it}$ where $CF_{it}$ is cash-flow from operations of firm, $A_{it-1}$ equals to the lag value of total assets, $Sales_{it}$ is sales volume of firm, $\Delta Sales_{it}$ is represents the sales volume of firm $i$ at time $t$ minus sales volume of firm $i$ at time $t - 1$ and $u_{it}$ represents the residual term, which captures the abnormal cash flow level.
(2) <i>REM_PROD</i>	It shows the firms' abnormal production cost, which is measured through the following equation: $\frac{PROD_{it}}{A_{it-1}} = \beta_1 \left( \frac{1}{A_{it-1}} \right) + \beta_2 \left( \frac{Sales_{it}}{A_{it-1}} \right) + \beta_3 \left( \frac{\Delta Sales_{it}}{A_{it-1}} \right) + \beta_4 \left( \frac{\Delta Sales_{it-1}}{A_{it-1}} \right) + u_{it}$ where $PROD_{it}$ refers the sum of CGS (cost of goods sold) and change in inventory level, and $u_{it}$ is residual term, it captures the abnormal production cost of firm. Although description of all other variables are same.
(3) <i>REM_DISEXP</i>	It represents the firms' abnormal discretionary expenses, it is measured by using following equation: $\frac{DISEXP_{it}}{A_{it-1}} = \beta_1 \left( \frac{1}{A_{it-1}} \right) + \beta_2 \left( \frac{Sales_{it-1}}{A_{it-1}} \right) + u_{it}$ where $DISEXP_{it}$ is sum of research and development expenditures and sales, general and administration expenditures (SG&A) and $u_{it}$ is residual term, it captures the abnormal discretionary expenses.
(4) <i>REM</i>	This is the comprehensive REM proxy which is established by taking the sum of the above three REM metrics $REM\_CFO + REM\_PROD + REM\_DISEXP$ .
Independent Variable	
<i>T_LEV</i>	Total leverage calculated as "total debt to total asset" ratio as proxy of high leverage (T_LEV) consistent with <a href="#">Tulcanaza-Prieto et al. (2020)</a> .
<i>ST_LEV</i>	Short-term leverage measured by "short-term debt to total assets" ratio.
<i>LT_LEV</i>	Long-term leverage measured by "long-term debt to total assets" ratio.
Control Variables	
<i>SFR</i>	Self-financing ratio (SFR), calculated as the "operating cash flows/net fixed assets" ( <a href="#">Lazzem and Jilani 2018</a> ).
<i>NPM</i>	Net profit margin, defined as "operating profit divided by sales volume" ( <a href="#">Chen et al. 2010</a> ).
<i>Tang</i>	Tangibility, defined as the ratio of "net plant, property, and equipment to book value of assets" ( <a href="#">Pappas et al. 2019</a> ).
<i>YSTOCKRET</i>	Yearly stock return of the firm, EM practices most often occur when management compensation is closely tied with firms' stock performance. Therefore, add yearly stock return in model consistent with ( <a href="#">Hussain et al. 2020</a> ).



Table 1. Cont.

Dependent Variable Measurement of Financing Constraints	Description and Measurements
FC	<p>Following prior studies <a href="#">Castro et al. (2015)</a>, <a href="#">Khan et al. (2017, 2020)</a>, we employ Kaplan and Zingales (KZ) index to categorize the firms into financially constrained and unconstrained firms <sup>1</sup>. <a href="#">Kaplan and Zingales (1997)</a> considered both qualitative and quantitative factors of firms to develop the five ratios which capture that whether the firm is financially constrained or not. Following above arguments (<a href="#">Lamont et al. 2001</a>) performed the ordered Logit estimation for the five ratios of financing constraints which are developed by Kaplan and Zingales. This study uses the estimated coefficients that they obtain to develop the KZ index for financing constraints in the following way:</p> $KZ_{it} = -\left(1.002 \frac{CF}{K_{t-1}}\right)it + (0.283Q)it + \left(3.139 \frac{D}{Total\ Cap}\right)it - \left(39.368 \frac{Div}{K_{t-1}}\right)it - \left(1.315 \frac{Cash}{K_{t-1}}\right)it$ <p>where <i>CF</i> is cash-flow, measured as by adding the depreciation and amortization into net income; <i>K</i> is capital stock, equals to the sum of property, plant, and equipment; <i>Q</i> represents the Tobin Q, measured through market value of assets/book value of assets; <i>D</i> shows the total debt level; <i>Total Cap</i> measured by adding the shareholders' equity into total debt; <i>Div</i> represents the total dividend payments, and <i>Cash</i> represents the cash it is measured as the sum of short-term investment and cash value.</p>

<sup>1</sup> [Lamont et al. \(2001\)](#) mainly constructed the KZ index for accessing the relationship between financing-constraints and shares return in US firms.

## 4. Results and Discussion

### 4.1. Univariate Analysis

Table 2 reports the descriptive evidence for the data of all three panels (Panel A: all Chinese non-financial listed firms; Panel B: financially constrained firms; Panel C: non-financially constrained firms). Notably, the average value of all REM proxies is different from zero in all panels. This gives the signal that EM exists in Chinese listed firms and indicates that the quality of accounting information is very lower. Further, descriptive evidence presents a very interesting scenario, the average value of REM proxies is lower in financially constrained firms as compared to unconstrained firms. These findings are maybe because constrained firms may face strict monitoring and control systems from the creditors' side which may restrict the managers' involvement in REM practices. The mean value of T\_LEV (total leverage) in all three scenarios lie between 44% and 48%, which shows that the debt ratio among Chinese listed firms is laying between low and high ratio. On the other hand, in all three panels, ST\_LEV (short-term leverage) mean values are approximately five times higher than the mean value of LT\_LEV (long-term leverage). These values highlight that Chinese firms utilize short-term debt approximately four times more instead of long-term debt. Further, the average value of SFR and Tangibility is higher (lower) in financially constrained (unconstrained) firms'. On contrary, the average value of NPM and YSTOCKRET is lower (higher) in financially constrained (unconstrained) firms.

Table 2 also presents the correlation matrices. The numeric values of correlation matrices highlight that all the correlation values are less than 0.31 except the correlation value of short-term leverage (ST\_LEV) with total leverage (T\_LEV) in all three panels. This is only because ST\_LEV (short-term leverage) is obtained from T\_LEV (total leverage). Hence, we treat leverage categories separately one by one in equations to cope up with the multicollinearity issue. Based on threshold level 0.70, given by [Kervin \(1992\)](#), we confirm that this study has no correlation diagnosis.

**Table 2.** Descriptive analysis.

Summary Statistics							
Variable	Panel A Overall Firms		Panel B Financially Constrained Firms		Panel C Non-Financially Constrained Firms		
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	
REM_CFO <a href="#">Roychowdhury (2006)</a>	0.08	0.23	0.06	0.16	0.09	0.28	
REM_PROD <a href="#">Roychowdhury (2006)</a>	0.13	0.69	0.10	0.42	0.16	0.88	
REM_DISEXP <a href="#">Roychowdhury (2006)</a>	0.13	0.33	0.12	0.33	0.13	0.33	
REM <a href="#">Roychowdhury (2006)</a>	0.34	0.98	0.28	0.66	0.38	1.19	
T_LEV	0.46	0.4	0.48	0.41	0.44	0.39	
ST_LEV	0.36	0.35	0.37	0.36	0.35	0.33	
LT_LEV	0.07	0.10	0.08	0.11	0.07	0.09	
SFR	0.29	18.53	0.31	9.00	0.28	24.62	
NPM	0.08	1.60	0.03	1.07	0.13	2.00	
Tangibility	0.17	0.17	0.24	0.20	0.10	0.10	
YSTOCKRET	0.16	0.63	0.15	0.62	0.17	0.64	
Panel A: Pearson correlation matrix							
	1	2	3	4	5	6	7
(1) T_LEV	1.00						
(2) ST_LEV	0.92	1.00					
(3) LT_LEV	0.25	−0.02	1.00				
(4) SFR	−0.01	−0.01	−0.02	1.00			
(5) NPM	−0.13	−0.12	−0.01	0.01	1.00		
(6) Tangibility	0.04	0.01	0.22	−0.01	−0.02	1.00	
(7) YSTOCKRET	0.04	0.05	−0.04	0.01	0.01	0.02	1.00
Panel B: Pearson correlation matrix							
(1) T_LEV	1.00						
(2) ST_LEV	0.94	1.00					
(3) LT_LEV	0.24	−0.05	1.00				
(4) SFR	−0.01	−0.01	−0.01	1.00			
(5) NPM	−0.17	−0.17	−0.01	0.01	1.00		
(6) Tangibility	0.07	0.01	0.31	−0.03	0.01	1.00	
(7) YSTOCKRET	0.04	0.05	−0.05	−0.02	0.01	0.04	1.00
Panel C: Pearson correlation matrix							
(1) T_LEV	1.00						
(2) ST_LEV	0.90	1.00					
(3) LT_LEV	0.26	0.02	1.00				
(4) SFR	−0.02	−0.01	−0.04	1.00			
(5) NPM	−0.12	−0.11	−0.01	0.01	1.00		
(6) Tangibility	−0.05	−0.02	−0.05	0.00	−0.02	1.00	
(7) YSTOCKRET	0.05	0.05	−0.03	0.03	0.01	0.03	1.00

Table 2 presents the summary statistics (mean and standard deviation) and Pearson correlation matrix for all three panels. Panel A contains all the non-financial Chinese listed firms, Panel B contains the Chinese non-financial listed firms which are financially constrained, and Panel C contains the Chinese non-financial listed firms which are non-financially constrained.

#### 4.2. Baseline Results

Current research in accounting, especially on EM have shown severe concerns about the potential endogenous biases. OLS approach cannot eliminate the endogeneity issue from the analysis ([Ahmed et al. 2021](#)). According to [Javeed et al. \(2020\)](#) fixed effect model is the most suitable approach to resolve the issue of unnoticeable heterogeneity from panel data under the notion of “stringent endogeneity”. Stringent endogeneity represents the situation when explanatory variables do not affect the firm predicted variable. In addition, [Gujarati and Porter \(2009\)](#) contended that the fixed effect approach is supposed to be

time-invariant. Hence, move towards individual-specific panel data test (fixed or random effect) to verify which model validates more the proposed hypothesis consistent with the following studies on EM (Habib et al. 2019; Hussain et al. 2020). Thus, we conduct the “Hausman Specification Test” to determine that is this effect is a fixed effect or random effect. The interpretation of the Hausman test is very straightforward if the  $p$ -value of Hausman is less than the threshold level 0.05 then rejects the null hypothesis and concludes that fixed effect is validated for the proposed model and vice versa. In the current study, we find that in all cases Hausman test reports that (prob > chi) value is fairly less than 0.05. Therefore, we use the fixed effects to estimate all models. Further, due to the complex nature of panel data we run several regressions for each scenario by employing all three matrices of REM individually as well as in combined form following Roychowdhury (2006) model to improve the robustness of outcomes.

Table 3 reports the results of estimated regression for H1, where three different REM measures (REM\_CFO, REM\_PROD, and REM\_DISEXP) individually, as well as in combined form (REM) are regressed on total leverage and set of numerous control variables. We find that, in column 1, the response of total leverage to REM\_CFO is insignificant in the estimated coefficient, while in columns 2 to 4 the response of total leverage to REM is positive and significant in estimated coefficients. This finding is in line with the debt covenant hypothesis of “Positive Accounting Theory”, which stated that managers of the highly leveraged firms are much motivated to use income-increasing EM practices to meet the expectation of creditors. This positive result is consistent with the following studies Anagnostopoulou and Tsekrekos (2017) and Tulcanaza-Prieto et al. (2020), all of which have shown that leverage gives incentive the managers to manage their earnings through utilizing the REM practices. Therefore, based on this positive and significant association between total leverage and REM practices we confirm that our H1 is verified for Chinese quoted listed firms. Further, this outcome suggests that leverage pursues the managers towards the utilization of REM practices due to mitigate the fear of debt covenant violation and increasing their own negotiation power. In debt contracts, creditors enforce different clauses that have major influences on manager decisions. These clauses are enforced by creditors due to diminishing the wealth transformation issue by firm owners in their accounts at the cost of creditors. Hence, managers are bound to give respect to all these clauses because in case of violation firm faces a higher cost of capital. Therefore, managers are motivated to play with REM activities to meet the creditor clauses to obtain loans at favorable conditions.

Concerning control variables, Table 3 reports that the response of SFR to two individual REM measures as well as to combine measure in negative and significant ( $p < 0.01$ ) in estimated coefficients. This reveals that if firms’ have enough level of internal resources to finance their investments then managers’ are not motivated to practices the REM activities. Thus, we conclude that SFR restricts the managers’ opportunistic behavior towards REM practices, and findings are aligned with the following studies (Lazzem and Jilani 2018; Wasimullah et al. 2010).

Although in column 1 the performance indicator NPM has a positive and significant association with REM\_CFO. This indicates that firms’ profitability is positively linked with the exploitation of EM practices consistent with Lazzem and Jilani (2018) findings. This suggests that managers of profitable firms practiced the REM technique to sustain the confidence level in front of creditors for obtaining more loans without any strict conditions.

Next, we document that, in column 1 to 4, tangibility have a negative association with all REM measures at ( $p < 0.01$ ) significance. These findings are consistent with the results of Pappas et al. (2019) study, which contended that firms with higher tangibility have a lower level of distress cost. Hence, lower distress cost does not motivate the manager to use REM practices.

Moreover, estimated regression also confirms that YSTOCKRET (yearly stock return) has a positive impact on REM practices at ( $p < 0.01$ ) significance in all measures. This result provides support to the notion that managers are utilizing more REM practices for

enhancing the stock returns (Bouwman 2014) and to give a positive sign in the stock market about their future financial health.

**Table 3.** H1 estimations (Role of total leverage in determining REM practices).

Panel A: Overall Firms				
	(1)	(2)	(3)	(4)
	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)
Variables	REM_CFO	REM_PROD	REM_DISEXP	REM
T_LEV	0.0018 (0.32)	0.0355 ** (2.01)	0.0362 *** (5.61)	0.0787 *** (3.28)
SFR	−0.0007 *** (−9.16)	−0.0012 *** (−4.89)	−0.0000 (−0.25)	−0.0019 *** (−5.81)
NPM	0.0025 ** (2.01)	0.0035 (0.95)	−0.0001 (−0.05)	0.0060 (1.19)
Tangibility	−0.0784 *** (−4.19)	−0.1920 *** (−3.30)	−0.0879 *** (−4.20)	−0.3553 *** (−4.48)
YSTOCKRET	0.0261 *** (11.22)	0.0570 *** (7.89)	0.0304 *** (11.73)	0.1162 *** (11.83)
Constant	0.0852 *** (19.87)	0.1370 *** (10.11)	0.1170 *** (24.44)	0.3340 *** (18.13)
Prob > F	0.0000	0.0000	0.0000	0.0000
Industry and Year FE	Yes	Yes	Yes	Yes

Table 3 present the outcomes of the impact of leverage (total debt/total assets) on REM practices in context of panel A (all Chinese non-financial listed firms). t-statistics are informed in parentheses. \*\*\*, \*\*, and \* indicates the  $p < 0.01$ ,  $p < 0.05$ , and  $p < 0.1$ , respectively.

Further, in the context of panel A, Table 4 report the result of estimated regressions for H2. The results show that in two out of three individual REM measures, as well as in combined REM measure, short-term leverage with coefficients values (0.0531, 0.0309, and 0.0925) are positively linked with REM practices at ( $p < 0.01$ ) significance in column 2 to 4, respectively, while columns 5 to 8 estimations highlight that the response of long-term leverage with all REM measures is negative. These outcomes about short-term and long-term leverage prove that short-term leverage more facilitates the Chinese firm managers to fabricate their earnings by utilizing the REM practices as compared to long-term leverage. Hence, we conclude that our H2 is true for Chinese quoted firms.

Findings are consistent with Park (2016) and Pappas et al. (2019) studies, which suggested that, in cases when debt has shorter maturities, managers are likely to be involved in REM practices due to portray better financial health in eyes of the creditor.

Short-term debt facilitates the immediate renegotiation of debt contracts and re-evaluation of firms' credit quality because in the case of short-term debt firms bear the higher risk and also face a higher cost of refinancing. Additionally, the beneficial effects of debt are much stronger in a case when the maturity of debt is shorter instead of longer because shorter maturity requires the borrower to contact with creditor immediately only after a short time span (Myers 1977). Based on this, Myers (1977) contended that EM has a detrimental effect in the case of short-term debt instead of long-term debt. Therefore, managers opportunistically fabricate the real transactions to obscure the firm actual financial health from creditors through employing REM activities. This, in turn, ultimately helps the firms to obtain additional finances without strict conditions from the lenders' side.

**Table 4.** H2 estimations (Role of short-term and long-term leverage in determining REM practices).

Panel A: Impact of Short-Term and Long-Term Leverage on REM Practices								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)
Variables	REM_CFO	REM_PROD	REM_DISEXP	REM	REM_CFO	REM_PROD	REM_DISEXP	REM
ST_LEV	0.0039 (0.68)	0.0531 *** (2.69)	0.0309 *** (4.15)	0.0925 *** (3.49)				
LT_LEV					−0.0089 (−0.34)	−0.0218 (−0.27)	−0.1880 *** (−6.56)	−0.2026 * (−1.83)
SFR	−0.0008 *** (−10.69)	−0.0012 *** (−4.99)	−0.0000 (−0.27)	−0.0020 *** (−6.08)	−0.0008 *** (−8.91)	−0.0013 *** (−4.87)	−0.0001 (−0.56)	−0.0021 *** (−5.85)
NPM	0.0024 ** (2.29)	0.0037 (1.02)	−0.0007 (−0.50)	−0.0054 (1.12)	0.0024 * (1.89)	0.0017 (0.44)	−0.0022 (−1.56)	0.0018 (0.35)
Tangibility	−0.0744 *** (−4.53)	−0.1890 *** (−3.31)	−0.0859 *** (−4.09)	−0.3459 *** (−4.51)	−0.0820 *** (−4.07)	−0.2020 *** (−3.21)	−0.0797 *** (−3.64)	−0.3578 *** (−4.20)
YSTOCKRET	0.0194 *** (9.51)	0.0488 *** (6.87)	0.0301 *** (11.50)	0.1006 *** (10.55)	0.0265 *** (10.67)	0.0586 *** (7.61)	0.0286 *** (10.59)	0.1164 *** (11.14)
Constant	0.0841 *** (23.13)	0.1340 *** (10.46)	0.1230 *** (26.40)	0.3371 *** (19.58)	0.0876 *** (20.37)	0.1570 *** (11.51)	0.1470 *** (31.53)	0.3892 *** (20.97)
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Industry and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	24,073	22,492	24,073	22,492	22,455	21,038	22,455	21,038
Group id's	3125	3122	3125	3122	3001	2921	3001	2921

Table 4 report the results of the impacts of short-term and long-term leverage (ST\_LEV and LT\_LEV, respectively) on REM practices in context of panel A (all Chinese non-financial listed firms). t-statistics are informed in parentheses. \*\*\*, \*\* and \* indicates the  $p < 0.01$ ,  $p < 0.05$ , and  $p < 0.1$ , respectively.

Further, we extend this research by adding the role of financing constraints in the relationship between leverage and REM practices. The division of firms is based on constrained and unconstrained through the KZ index. To improve the robustness of outcomes we also employ four different measures of REM to check the influence of each leverage category on REM practices in both scenarios' (constrained and unconstrained firms). Table 5 reports the result of estimated regressions for H3 of this study, where four different REM proxies are regressed on total leverage and multiple control variables for both panel B and C scenarios. We argue that in, panel B, the response of total leverage to three out of four REM measures is insignificant, while in only one measure, REM\_PROD, the response of leverage is significant but negative in the context of panel B. On contrary, we find that in three out of four measures the influence of leverage on REM practices is significant and positive in the case of unconstrained firms (Panel C). These findings totally contradict the predictions of this study and not verifies the H3 of our study, because the overall findings of Table 5 document that constrained firms restrict the managers' behavior toward REM practices as compared to unconstrained firms.

The results of constrained firms are in line with the control hypothesis, which stated that debt moves the control on the firm from managers to creditors, which, in turn, ultimately restricts the managers' involvement toward REM practices. Similarly, the constrained firm does not have a good reputation in the capital market (Devos et al. 2012), thus constrained firms bear the strict scrutiny of the lender, which regularize the managers' behavior. Another key reason behind these findings is that because constrained firms do not have a sufficient level of cash-flows that restrict the managers to play with daily operating activities that have actual cash-flow consequences, i.e., REM practices. Further, the positive response of leverage towards REM practices in the case of unconstrained firms proves that because these firms have a good reputation in the capital market and do not face strict monitoring, auditing, and controlling mechanism, which, in turn, allow the managers to manage their earnings to maintain their positive image in the capital market and to attain more loans in future at favorable conditions.

Moreover, we also test the H4 of this study, whether the response propensity of short-term leverage to undergo toward REM practices is increases (decreases) in case of financially constrained (unconstrained) firms as compared to long-term leverage? Tables 6 and 7 report the estimated coefficients for H4 of our study and findings reveal by the answer "NO". Hence, we conclude that our H4 of this study is not verified. The results reports that, in panel B, short-term leverage is negatively associated with three out of four REM measures, while in the context of panel C the response of short-term leverage to all four REM measures is positive and significant at different levels. These results are in line with reputational concerns because constrained firms do not have a good reputation in the capital market, which disciplines the managers' role in REM practices in case of lower debt maturities.

Further, Fung and Goodwin (2013) claimed that shorter maturities are likely to work as a monitoring mechanism, which mitigates the managers' discretion over EM practices. Therefore, financing constraints dampen the role of short-term leverage towards REM practices as compared to unconstrained firms. Results also provide support to the notion of Myers (1977), which stated that when firms' creditworthiness has no doubt (unconstrained firms) then the short-term debt is much beneficial for managers as compared to constrained firms. Further, when debt maturities are shorter, the lenders are interested in the credit services of constrained firms instead of reporting quality. This also indicates that in constrained firms, short-term debt suppresses the managers' involvement in REM practices.

**Table 5.** H3 estimations (Role of total leverage in determining REM practices in both constrained and unconstrained firms' scenario).

Variables	Panel B: Financially Constrained Firms				Panel C: Non-Financially Constrained Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)
	REM_CFO	REM_PROD	REM_DISEXP	REM	REM_CFO	REM_PROD	REM_DISEXP	REM
T_LEV	−0.0040 (−1.00)	−0.0227 *** (−3.55)	0.0029 (0.30)	−0.0222 (−1.48)	0.0150 (1.41)	0.1024 *** (4.19)	0.0561 *** (7.31)	0.1602 *** (3.45)
SFR	−0.0002 ** (−2.16)	−0.0002 (−0.83)	−0.0000 (−0.14)	−0.0004 (−0.88)	−0.0005 *** (−4.63)	−0.0008 *** (−2.78)	−0.0000 (−0.41)	−0.0017 *** (−3.58)
NPM	0.0059 *** (4.44)	0.0020 (0.94)	0.0000 (0.01)	0.0080 (1.61)	0.0021 (1.14)	0.0062 (1.16)	0.0032 ** (2.36)	0.0104 (1.30)
Tangibility	−0.0249 ** (−2.09)	−0.0094 (−0.49)	−0.0700 ** (−2.41)	−0.1027 ** (−2.29)	−0.1110 ** (−2.49)	−0.1907 ** (−2.36)	−0.0162 (−0.50)	−0.4287 ** (−2.08)
YSTOCKRET	0.0045 *** (2.65)	0.0022 (0.81)	0.0326 *** (7.95)	0.0400 *** (6.31)	0.0340 *** (8.50)	0.0976 *** (7.86)	0.0244 *** (8.44)	0.1570 *** (8.69)
Constant	0.0705 *** (19.22)	0.1120 *** (18.88)	0.1310 *** (14.71)	0.3122 *** (22.54)	0.0879 *** (13.18)	0.1134 *** (6.90)	0.0997 *** (20.67)	0.3153 *** (10.57)
Prob > F	0.0000	0.0035	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Industry and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,236	10,895	11,236	10,895	13,089	11,827	13,089	11,827
Group id's	2263	2236	2263	2236	2636	2528	2636	2528

Table 5 report the results of the impact of leverage (total debt/total assets) on REM practices in context of panel B (financially constrained firms) and panel C (non-financially constrained firms). t-statistics are informed in parentheses. \*\*\*, \*\*, and \* indicates the  $p < 0.01$ ,  $p < 0.05$ , and  $p < 0.1$ , respectively.

**Table 6.** H4 estimations (Role of short-term and long-term leverage in determining REM practices in constrained firms).

Panel B: Financially Constrained Firms								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)
Variables	REM_CFO	REM_PROD	REM_DISEXP	REM	REM_CFO	REM_PROD	REM_DISEXP	REM
ST_LEV	−0.0019 (−0.42)	−0.0220 *** (−3.10)	0.0188 * (1.74)	−0.0034 (−0.21)				
LT_LEV					−0.0006 (−0.03)	−0.2130 *** (−4.97)	0.0068 (0.24)	−0.2051 *** (−3.06)
SFR	−0.0002 ** (−2.09)	−0.00015 (−0.80)	−0.0000 (−0.15)	−0.0004 (−0.85)	−0.00023 * (−1.87)	−0.0001 (−0.34)	−0.0002 (−0.93)	−0.0005 (−0.99)
NPM	0.0061 *** (4.54)	0.0022 (1.04)	0.0012 (0.36)	0.0095 * (1.91)	0.0070 *** (4.81)	−0.0006 (−0.19)	0.0037 (1.59)	0.0099 * (1.86)
Tangibility	−0.0253 ** (−2.11)	−0.0107 (−0.55)	−0.0709 ** (−2.43)	−0.1051 ** (−2.33)	−0.0247 * (−1.95)	−0.0696 ** (−2.30)	−0.0047 (−0.23)	−0.0966 ** (−2.05)
YSTOCKRET	0.0045 *** (2.65)	0.0023 (0.83)	0.0326 *** (7.91)	0.0401 *** (6.29)	0.0042 ** (2.36)	0.0299 *** (7.07)	0.0021 (0.74)	0.0368 *** (5.58)
Constant	0.0696 *** (19.53)	0.1100 *** (18.97)	0.1260 *** (14.55)	0.3037 *** (22.57)	0.0689 *** (18.76)	0.1530 *** (17.43)	0.0997 *** (16.74)	0.3204 *** (23.25)
Prob > F	0.0000	0.0122	0.0000	0.0000	0.0000	0.0000	0.5440	0.000
Industry and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,162	10,826	11,162	10,826	10,540	10,540	10,240	10,240
Group id's	2255	2228	2255	2228	2176	2176	2132	2132

Table 6 report the results of the impacts of short-term and long-term leverage (ST\_LEV and LT\_LEV, respectively) on REM practices in context of panel B (financially constrained firms). t-statistics are informed in parentheses. \*\*\*, \*\*, and \* indicates the  $p < 0.01$ ,  $p < 0.05$ , and  $p < 0.1$ , respectively.



**Table 7.** H4 estimations (Role of short-term and long-term leverage in determining REM practices in unconstrained firms).

Panel C: Non-Financially Constrained Firms								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)	Roychowdhury (2006)
Variables	REM_CFO	REM_PROD	REM_DISEXP	REM	REM_CFO	REM_PROD	REM_DISEXP	REM
ST_LEV	0.0189 * (1.82)	0.1190 *** (2.85)	0.0164 * (1.77)	0.1605 *** (3.03)				
LT_LEV					0.0055 (0.11)	−0.0773 (−0.46)	−0.0929 ** (−2.76)	−0.1331 (−0.61)
SFR	−0.0005 *** (−5.81)	−0.0011 *** (−3.25)	−0.0000 (−0.44)	−0.0017 *** (−3.76)	−0.0005 *** (−4.31)	−0.0012 ** (−3.19)	−0.0001 (−0.74)	−0.0018 *** (−3.55)
NPM	0.0018 (1.21)	0.0044 (0.74)	0.0017 (1.28)	0.0079 (1.03)	0.0014 (0.69)	0.0028 (0.44)	0.0014 (1.07)	0.0055 (0.66)
Tangibility	−0.1020 *** (−2.79)	−0.3090 ** (−1.99)	−0.0021 (−0.06)	−0.4014 ** (−2.05)	−0.1080 ** (−2.23)	−0.3020 * (−1.76)	0.0141 (0.42)	−0.3778 * (−1.70)
YSTOCKRET	0.0202 *** (6.14)	0.0768 *** (5.59)	0.0239 *** (8.14)	0.1239 *** (7.12)	0.0351 *** (8.11)	0.0973 *** (6.49)	0.0235 *** (7.91)	0.1606 *** (8.28)
Constant	0.0874 *** (16.41)	0.1320 *** (5.89)	0.1180 *** (24.85)	0.3310 *** (11.70)	0.0940 *** (14.48)	0.1770 *** (7.67)	0.1270 *** (28.48)	0.3919 *** (13.12)
Prob > F	0.0000	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
Industry and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,911	11,666	12,911	11,666	11,915	10,798	11,915	10,798
Group id's	2620	2509	2620	2509	2475	2325	2475	2325

Table 7 reports the results of the impacts of short-term and long-term leverage (ST\_LEV and LT\_LEV, respectively) on REM practices in context of panel C (non-financially constrained firms). t-statistics are informed in parentheses. \*\*\*, \*\* and \* indicates the  $p < 0.01$ ,  $p < 0.05$ , and  $p < 0.1$ , respectively.

## 5. Conclusions

Studies have documented that capital structure is a relevant factor for EM, but without a clear consensus. Some researchers have claimed that both total and short-term leverage exert a control effect, which dampens the manager involvement in EM practices. However, other studies argued that both total and short-term leverage increases the bankruptcy risk and liquidity, facilitating managers to engage in EM practices. Furthermore, financing constraints also play an essential role in decisions concerned with capital structure (Farrell et al. 2014). Following the above arguments, this study investigates the impact of leverage categories on REM practices and how financing constraints reshape the nature of this relationship. Four novel findings emerge from this study by using the large panel of Chinese non-financial listed firms and employing panel data fixed and random effect models as an econometric approach. First, consistent with the “debt covenant hypothesis of positive accounting theory” this study reveals that total leverage has a positive response to REM practices. Second, this study reveals that short-term leverage facilitates the managers more to utilize REM practices as compared to long-term leverage.

Third, this study documents that financing constraints dampen the effects of leverage on the opportunistic use of REM as compared to non-financing constraints. Fourth, the propensity of influence of short-term leverage on REM practices as compared to long-term leverage is also weakened in the case of a financially constrained firm. These fourth finding leads the ample evidence that financially constrained firms’ usually lie under the strict monitoring of outsiders, which, in turn, limits the managers’ involvement in REM practices.

By examining the managers’ behavior towards REM practices in different contexts, this study has clear policy implications. Particularly, the positive linkage of leverage with REM practices implies that leverage gives incentive the managers to use REM practices for increasing their income level through applying a number of tactics, like by providing a discount on sales, making more relaxed credit policies, and reducing the R&D expenditure to repay their debts and obtaining more loans at economic conditions. This result recommends that both standard setters and Chinese regulatory agencies try continuously to improve their accounting information quality and accounting standards because this would discourage the managers’ involvement in REM practices. Moreover, managers’ positive behavior toward REM practices also confirms the existence of severe asymmetric information between investors and managers. Thus, to evade the consequences of managerial myopia regulatory bodies should consider some measures to keenly access the firms’ daily operations in different ways and ensure that managers are not involved in fraudulent activities.

The present research has some limitations and future directions for researchers and practitioners. This study does not directly measure the opportunistic behavior of managers towards the use of REM practices; rather, we only measure the opportunistic behavior of managers by employing different models of REM. Therefore, future scholars may extend this research by directly estimating the managers’ opportunistic behaviors. In addition, future researcher may contribute in literature by adding some macro-level variables in the model, which are missing in the current model. Further, the outcomes of this research is only based on non-financial listed firms and completely ignores the financial sector of China, which is also the major drawback of this study. Hence, future researchers may extend the study by considering all firms (financial and non-financial) or may make comparison between the outcomes of financial and non-financial listed firms. Additionally, research can be made more précised by conducting industry-wise comparison.

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