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**Article**

## The impact of short-term debt on accruals-based earnings management: Evidence from Vietnam

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## GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

# The impact of short-term debt on accruals-based earnings management – evidence from Vietnam

Trinh Quoc Trung<sup>1,2\*</sup>, Nguyen Thanh Liem<sup>1,2</sup> and Cao Thi Mien Thuy<sup>1,2</sup>

**Abstract:** This study seeks to examine the relationship between short-term debt maturity and accruals-based earnings management using a sample of listed firms in Vietnam from 2010–2017. The extant literature remains under-explored on the impact of short-term debt on accruals-based earnings management at low and high levels of short-term debt. We further dissect the impact of the interaction between the growth opportunities and short debt maturity on accruals-based earnings management. Our findings provide evidence suggesting that short-term debt maturity is likely to exert a desirable impact in lowering earnings management at low levels of short-term debt, while at high levels it tends to increase earnings manipulation, demonstrating a U-shaped relationship. Furthermore, we show that growth opportunities moderate the impact of short debt maturity on earnings management. Specifically, the U-shaped pattern between short-term debt and earnings management is pronounced for firms with low growth opportunities, while for high-growth counterparts that pattern weakens.

**Subjects:** Corporate Finance; Investment & Securities;

**Keywords:** short-debt maturity; earnings management; growth opportunities; non-linear impact

### ABOUT THE AUTHOR

Assoc. Prof. Trinh Quoc Trung is doing research in the banking field, and has published several papers at quality domestic and international journals. PhD. Nguyen Thanh Liem earned his degree in the field of corporate finance, and his research interests cover a wide range of empirical issues, including debt structure, corporate governance, bank efficiency, etc. He has published at quality journals, including *Cogent*, *Pacific Accounting Review*, *Sustainability*, *International Journal of Energy Economics and Policy*, *Afro-Asian Journal of Finance and Accounting*, etc. PhD candidate Cao Thi Mien Thuy is also doing research on earnings management and corporate social responsibility. The present paper is part of our project on earnings management. The authors have strong interests in the field of capital structure and debt maturity structure, especially determinants for these factors. In our project, we focus on the advantages and disadvantages of short-term debt at low and high levels of short-term debt.

### PUBLIC INTEREST STATEMENT

Short-term debt is riskier than long-term debt when it comes to refinancing risk and liquidity risk. This leads to both advantages and disadvantages in employing short-term debt. This study examines the impact of short-term debt on income-increasing earnings management in the context of Vietnam, a country where firms have high ratios of short-term debt to total debt and severe information asymmetry in the market. The study finds that at its low levels, short-term debt tends to lead to lower income-increasing earnings manipulation. On the other hand, at high levels short-term debt is more likely to raise income-increasing earnings manipulation. Furthermore, the impact of short-term debt on earnings management differs with firms that have low and high levels of growth opportunities. This study partly helps reconcile mixed findings about the influence of debt on earnings management, and bring about practical implications for managers and fund providers.

## 1. Introduction

Earnings management has become a major concern of regulators and practitioners because it has adversely deteriorated the reliability of financial reporting (Levitt, 1998; Du & Shen, 2018). The viewpoint of agency theory is that, earnings manipulation may arise when managers have discretion to pursue their own interest at the shareholders' expense, or to mislead debtholders in their lending decisions. This issue is highly relevant after high-profile accounting scandals committed by renowned corporations such as Enron and WorldCom in the US and Parmalat in Italy.

Extant research has delved into potential effects of debt on earnings management. One strand of research focuses on the undesirable effect of debt: it may urge managers to manipulate accruals so that covenant breach (DeFond & Jiambalvo, 1994) or lender enforcement (Gupta et al., 2008) can be avoided. Fields et al. (2018) find that short-term debt hike is associated with higher discretionary accruals, especially for firms that are about to obtain new loans. These detrimental repercussions are anticipated according to financial distress theory (Fung & Goodwin, 2013; Gupta et al., 2008). Since short-term debt is conducive to liquidity risk compared to long-term debt, the positive correlation between short-term debt and earnings manipulation should be higher compared to the more intensively investigated relationship between general debt and earnings management.

Another distinctive feature between short-term debt and long-term debt is that the former exposes the management to more regular monitoring by debtholders, which explains why it is in the position to play as a more effective governance mechanism. Myers (1977) suggests that short-term debt disciplines borrowers if they shirk, as the firms are subject to more regular information exchanges with lenders to renew the short-term loans.

The intrinsic differences between short- and long-term debt, as well as the inconsistent empirical evidence on the link between leverage and earnings management, point to necessity to conduct research that specializes in the effect of short-term debt. Several studies document a positive relationship between unsigned discretionary accruals, as a measure of earnings management, and debt (Fung & Goodwin, 2013; Klein, 2002), supporting financial distress theory. However, Fung and Goodwin (2013) argue that debt's monitoring role has largely been ignored, and this desirable role is more likely to be credited to short-term debt rather than long-term counterpart. Consistently, Datta et al. (2005) and Fung and Goodwin (2013) contend that short-term debt helps alleviate agency costs, reducing earnings management (or increasing earnings quality) for firms with higher creditworthiness.

The present study is motivated on the following grounds. First, short-term debt is not similar to long-term debt. The former is riskier because it promotes liquidity risk, but it also has merits in that it subjects managers to more frequent reporting in an effort to successfully renew loans in the future. However, the majority of empirical literature concentrates on the link between debt and earnings management, without discriminating short- and long-term debt, see for example, DeFond and Jiambalvo (1994), Jaggi and Lee (2002), Ghosh and Moon (2010), Zang (2012), Alzoubi (2018), and Lazzem and Jilani (2018). Therefore, we extend the contemporary literature by examining the relationship between short-term debt and earnings management.

Second, Fung and Goodwin (2013) and Fields et al. (2018) examine the linear effect of short-term debt on earnings manipulation. In the present study, we believe and hypothesize the non-linear effect of short-term debt on earnings management, which aids in reconciling the mixed empirical findings about both the positive and negative associations between debt and earnings manipulation (Datta et al., 2005; Fields et al., 2018; Fung & Goodwin, 2013). To be more specific, we expect the impact of short-term debt is more in line with financial distress theory in the case of high short-term debt use, while at low levels it leans towards reducing earnings management,

consistent with monitoring effect hypothesis. These together should provide another channel for reconciling the inconsistent findings as regards the impacts of short-term debt.

Third, we aim to examine the influence of the information asymmetry and agency cost associated with growth opportunities on the link between short-term debt and earnings management. Growth opportunities are expected to raise higher agency cost and information asymmetry in the previous literature on both earnings manipulation and debt maturity. AlNajjar and Riahi-Belkaoui (2001) and Chen et al. (2010) find significant impact of investment opportunity and earnings management, while a number of debt maturity determinants document the importance of growth factor (Cai et al., 2008; Krishnankutty & Chakraborty, 2014). Nonetheless, we have not found any studies that aim to verify whether this factor would moderate the non-linear relationship between short-term debt and earnings management.

Finally, the present study sets to fill these gaps, at least in Vietnamese context, a developing country. Vietnam houses an interesting setting for this research for two reasons: first, firms in Vietnam, even listed ones, have high ratios of short-term debt to total debt despite great efforts from the government and international organizations in improving access to long-term finance; second, Vietnam is in the process of converging to international financial reporting standards and upgrading corporate governance following best practices, which altogether are expected to provide more accurate and reliable financial reports. However, the progress still leaves ample room for improvement because of the low harmonization with IFRS and that cases of deliberate misrepresentation of earnings still have surfaced recently.

## **2. Literature review and hypothesis development**

### **2.1. Short debt maturity and earnings management**

#### *2.1.1. Debt maturity and earnings management in Vietnam*

Earnings manipulation serves to accomplish mischievous purposes. In Vietnam, classic cases of fraudulent earnings reporting such as KSS and JVC corporations can easily shatter investor trust, thus hampering firms' access to external financing channels. Weak corporate governance in Vietnam is bound to exacerbate this problem because it is associated with insufficient control for reporting mechanism (ADB, 2014). Furthermore, Ta et al. (2018) discuss the harmonization between Vietnamese Accounting Standards and IFRS (International Financial Reporting Standards) in the composition of financial statements. The authors highlight a low level of harmonization between the two standards (50%), and that VAS has various shortcomings that need to be addressed to lower the gap between the two accounting standards. The lack of a more stringent reporting standard could be one of the conditions that firms may abuse to facilitate the management of earnings. Besides public cases that have been revealed, T. H. Nguyen and Nguyen (2017) provide empirical evidence that confirms the presence of earnings management practised by managers in an effort to inflate the bottom line.

Another inherent drawback of Vietnamese firms is the high proportions of short-debt maturity. In 2018 World Bank awarded Vietnam the 29<sup>th</sup> rank out of 190 countries in terms of credit access thanks to relentless bids from the government to revamp regulatory framework regarding collaterals and credit information system's operations. Nonetheless, firms in Vietnam still find the lack of (long-term) credit as a major hindrance to grow and compete sustainably. Fan et al. (2012), Demircuc-Kunt et al. (2015), Cortina et al. (2017), and Beck (2016) and World Bank (2015) emphasize the chronic low supply of long-term credit in developing countries, especially for economies that are heavily dependent on banking system. According to World Bank Database, private credit provided by banking sector in Vietnam stood at 141.85% of GDP, depicting the issue of strong reliance on bank financing and thus low debt maturity in this country (H. T. B. T. Nguyen & Tran, 2017). Both short debt maturity structure and earnings management are problematic to firms' performance in several perspectives. Since the duo are evident in Vietnam, it is in the

interest of policymakers, investors and managers to understand how short-term debt can affect the likelihood of firms to resort to earnings management.

### 2.1.2. *Earnings management and corporate leverage*

Earnings management is detrimental because it clouds the true information about the firm performance. Through generating insufficient and inaccurate data, earnings manipulation adversely affects resource allocation as investors may award funding to firms with low credit-worthiness instead. In order to mask earnings, managers rely on two main approaches, real and accruals-based earnings management. By altering real operations such as making cuts in the departments of research and development, advertising or providing sales promotions, firms can meet current income targets at the expense of future performance (Roychowdhury, 2006). Otherwise, if they prefer not to interfere with the real operations, managers can use their discretion in selecting accounting policies as long as they are allowed, affecting accruals (Healy, 1985; Teoh et al., 1998). Accruals are indispensable in reporting income since they allow managers to record economic events without cash changing hands. Nonetheless, accruals may introduce a source of bias if unscrupulously manipulated. According to Fung and Goodwin (2013), accruals-based earnings management is more related to financial distress theory, so this type of activity is also our main subject of research.

Leuz et al. (2003) suggest that firms that have high agency costs tend to have higher levels of earnings management. As a consequence, it can be anticipated that mechanisms tackling agency costs serve to reduce earnings management. Dechow et al. (1996), Beasley (1996), Peasnell et al. (2005), and Carcello et al. (2002) focus on internal governance schemes, demonstrating that more independent committee members are more likely to demand better quality financial statements, so reducing earnings management. Vo and Chu (2019) suggest that foreign shareholders tend to raise the quality of corporate financial disclosure. As for external governance, Lin and Hwang (2010) and Alzoubi (2018) postulate that audit quality curbs earnings management. Studies that concentrate on other governance mechanisms such as debt, especially short-term debt maturity, are quite limited.

On the one hand, debt in general has been predicted to be positively related to accruals-based earnings management. DeFond and Jiambalvo (1994) and Jaggi and Lee (2002) contend that firms close to breaching covenants would choose to avoid the incident by presenting better income figures following earnings manipulation. Lazzem and Jilani (2018) find that total debt has a positive effect on French firms' earnings manipulation. Other authors believe that firms take on earnings management to defer the revelation of bad news (Gupta et al., 2008; Sercu et al., 2006). Gupta et al. (2008) find that firms with bad news are prone to use accruals to conceal the news when they have higher levels of short-term debt. The positive correlation between earnings management and debt is predicted under financial-distress theory or debt covenant hypothesis (Fung & Goodwin, 2013).

On the other hand, debt may favorably alleviate earnings management problem in some cases. Fung and Goodwin (2013) find that short-term debt leads to higher likelihood of earnings management on average, in line with Gupta et al. (2008). However, Fung and Goodwin claim that only firms with higher creditworthiness benefit from the monitoring effect of short-term loans. Ahn and Choi (2009) also argue that less financially constrained firms are associated with less accruals-based earnings management. Ghosh and Moon (2010) investigate the non-linear relation between total debt and earnings management, and find that monitoring effect is dominating when debt is low but financial distress effect prevails when debt is high. Similar studies on the nonlinear link is under-researched for short-term debt, while short-term debt maturity clearly possesses different characters compared to debt in general (Fung & Goodwin, 2013; Myers, 1977).

Literature has made inadequate distinction regarding the impact of short and long-term debt (Fung & Goodwin, 2013). This is probably because the financial-distress theory can particularly be relevant to explain the potential influence of short-term debt on earnings manipulation. Short-term debt is more likely to worsen a firm's liquidity risk and covenant breach likelihood, compared

to long-term debt. Judging from that, it is predicted that short-term debt has a positive correlation with earnings management on average. Empirical works from Gupta et al. (2008) and Fung and Goodwin (2013) have confirmed this relation on average.

Short-term debt has the monitoring advantage compared to long-term debt since the former demands higher renegotiation costs upon the event that borrowers shirk (Rey & Stiglitz, 1993). Short-term debt exposes firms to a constant need of renewing loans than long-term debt (Stulz, 2000). Diamond (1991) argues that managers with more favorable news to reveal are more likely to employ short-term debt, so that the agency cost is lower and chances are they will receive better loan terms in the future. Therefore, firms with lower agency costs tend to choose short-term debt because they are more willing to subject themselves to more monitoring. However, Datta et al. (2005) and Fung and Goodwin (2013) suggest that short-term debt has induced firms to conduct earnings management for low creditworthy firms, while high creditworthy firms are not likely to fall victim to this negative effect. Fung and Goodwin (2013) claim that managers of high creditworthy firms are not likely to be motivated by financial distress-related incentives caused by employing short-term debt.

In summary, the argument is that at low levels of short-term debt, the pressures for earnings management are low and firms may withhold the desire to manipulate earnings. This is because accruals-based earnings manipulation can be discovered by market players and the ensuing costs might be catastrophic. At high levels of short-term debt, earnings management may be employed to a greater extent to assist firms in circumventing the revelation of their true financial status. In other words, high levels of short-term debt can cause early liquidation problems and high liquidity risk. These risks are low at lower levels of short-term debt and can be surpassed by the desire to trade more accurate information for better loan terms in the future. On the contrary, at high levels of short-term debt the benefits from better accounting quality are not able to match the financial-distress-related incentives so firms are expected to engage in earnings management. These arguments lead to our first hypothesis as follows:

***H1: short-term debt has a U-shaped impact on accruals-based income-increasing earnings management.***

## **2.2. Growth opportunities and earnings management**

Contracting-based accounting theory suggests that managers can choose accounting procedures in an efficient or opportunistic manner. Under an efficient contracting viewpoint, management manipulates earnings to convey private information to investors (Scott, 2006). Earnings management can be beneficial to both investors and managers when the firms encounter high operating uncertainty and the private information amount is high (Stocken & Verrecchia, 2004). On the other hand, managers can manipulate earnings in an opportunistic manner in order to maximize their compensation and reduce the chances of being penalized by debt contracts (Scott, 2006). Managers could perform earnings management to influence stock prices (Bergstresser et al., 2006), to earn more from equity incentives (Jiang et al., 2010) and meet earnings forecasts (Dutta & Gigler, 2002; Jaggi et al., 2006).

Growth opportunities are an important component in the total corporate value, and the investment opportunities can be considered as call options whose value depends on how likely the management will exercise them (Myers, 1977). It is more challenging for outsiders to observe and monitor firms with strong investment opportunities or whose value comprises a large portion of future growth options (Smith & Watts, 1992). As a result, the managers of high-growth firms have more incentives to act opportunistically (Watts & Zimmerman, 1986) and this even exacerbates the observability of those firms, leading to higher investment risk (Smith & Watts, 1992). Doyle et al. (2007) and Andersen et al. (1993) argue that growth firms which have less effective control mechanisms tend to allow higher level of accruals.

Other studies also point out that firms with higher growth rates tend to perform earnings manipulation. Shen and Chih (2007) postulate that firms with higher growth opportunities resort to earnings smoothing and earnings aggressiveness. Chen et al. (2010) also find that firms with more investment opportunities tend to engage in earnings management. Weiming et al. (2016) argue that the positive link between growth rates and earnings management is more pronounced when business risks present at the same time.

Even though the majority of the extant studies tend to suggest a positive relationship between growth opportunities and earnings management, AlNajjar and Riahi-Belkaoui (2001) argue that income-reducing accruals are more likely to be conducted for firms with higher growth opportunities. This is because reporting high accounting rates of return associated with strong investment opportunities may indicate monopolistic power, thus drawing scrutiny and thus higher political costs and political risk. In this case, managers may decide to lower earnings to reduce both political costs and risk.

As suggested by contracting theory under opportunistic viewpoint, managers may have incentive to conduct earnings manipulation when firms have growth opportunities because outsiders have less ability to judge the true financial picture of the firms. Other incentives of income-increasing earnings management include to influence stock prices (Bergstresser et al., 2006), to earn more from equity incentives (Jiang et al., 2010) and meet earnings forecasts (Dutta & Gigler, 2002; Jaggi et al., 2006), all of which should be higher when firms have higher growth opportunities. Therefore, based on these arguments and in line with the findings of the majority of extant works, our second hypothesis is as follows:

**H2: Growth opportunities are positively related to income-increasing earnings management.**

### **2.3. The impact of short debt maturity, growth opportunities and earnings management**

At low levels of short debt maturity, firm risk is also low. As earnings management has its own cost, e.g., punishment by market players or litigation risk when the manipulation is revealed, firms will refrain from using it when its cost is higher than the benefits of conveying private information. Firms with lower growth opportunities are considered to have lower risk, lower uncertainty and higher level of observability (Smith & Watts, 1992). In addition, the proportion of call option value from growth opportunities is lower. It is expected that firms with lower growth opportunities should have even fewer incentives to engage in income-increasing earnings manipulation if the focal firms also have low levels of short-term debt.

The choice of short-term debt could signal firm quality due to high transaction costs associated with short-term debt renewal (Flannery, 1986). Short-term debt increases the frequency of information exchange between debtholders and the firm, so it is expected to reduce the information asymmetry between these two parties. As growth opportunities are associated with higher levels of uncertainty and information asymmetry, thus firms with high growth opportunities tend to choose short-term debt for the relevant benefits it brings. Nonetheless, short-term debt has its own cost: increasing the likelihood of liquidity risk and refinancing risk (Diamond, 1991), so only firms with strong creditworthiness should choose this type of debt.

In other words, firms with high growth opportunities have more risk and uncertain cash flows. Given the same situation of low level of short-term debt, these firms should have more incentives to perform earnings management due to opportunistic behavior or agency cost problems, compared to their low-growth peers. On the other hand, given the same situation of high level of short-term debt, high-growth firms should aim to signal their quality and are less likely to inflate earnings, compared to their low-growth counterparts. Therefore, our third hypothesis is established as follows:

**H3: For high-growth firms, short-term debt tends to be more positively (negatively) associated with income-increasing earnings management at low (high) levels of short-term debt.**



### 3. Research methodology

Our initial sample covers all non-financial firms listed on the Vietnam Stock Exchange over the period from 2010–2017. To test the hypotheses above, we resort to the following model which draws from relevant studies such as Fung and Goodwin (2013), Ghosh et al. (2010), Zang (2012), and Alzoubi (2018):

$$AEM_{it} = \beta_0 + \beta_1 AEM_{it-1} + \beta_2 Shortdebtmat_{it} + \beta_3 Shortdebtmat2_{it} + \beta_4 Size_{it} + \beta_5 Leverage_{it} + \beta_6 MTB_{it} + \beta_7 ROA_{it} + \beta_8 Posprofit_{it} + \beta_9 Cash_{it} + \beta_{10} BoardSize_{it} + \varepsilon_{it} \quad (1)$$

where AEM is the measure for earnings management, and  $AEM > 0$  indicates income-increasing earnings management. Shortdebtmat is the ratio of short-term debt to total debt, so the higher ratio reflects shorter debt maturity, consistent with Fung and Goodwin (2013). Shortdebt2 is the squared value of Shortdebt, included to test the non-linear effect of short-term debt on earnings management. Size is the natural logarithm of total assets to proxy for firm size, and MTB measures the growth opportunities (Alzoubi, 2018; Skinner & Sloan, 2002; Zang, 2012). Leverage (the ratio of total debt to total assets) can increase the liquidity risk and pressure to engage in earnings management (Alzoubi, 2018; Weiming et al., 2016; Zang, 2012), while ROA, return on assets, measures firm profitability (Weiming et al., 2016; Zang, 2012). Boardsize is the number of the members of board of management. According to Ghosh et al. (2010), larger boards tend to have larger breadth of knowledge which is efficient in monitoring financial reporting, as a result, we expect that there is a negative relationship between Boardsize and earnings management.

We include a dummy variable *Posprofit* to control whether the firm reports a positive profit is associated with lower likelihood of income-increasing earnings management. According to Burgstahler and Dichev (1997), Shen and Chih (2005), firm are reluctant to report losses, and the survey results in Graham et al. (2005) suggest that accounting numbers are manipulated to help conceal the true losses. Therefore, we expect that the more positive profits, the lower likelihood or incentives for firms to take on income-increasing earnings management to confuse financial statement users about the true financial outcomes. Cash is the ratio of cash and equivalent to total assets, to control for the effect of cash holdings on earnings management (Farinha et al., 2018). Myers and Majluf (1984) and Pinkowitz et al. (2006) suggest that cash holding has a positive impact on firm value because it lowers information asymmetry and transaction costs, thus alleviating the detrimental impact of financial constraints. Fung and Goodwin (2013) suggest that firms with more financial constraints have more incentives to engage in income-increasing earnings management. Thus, we expect that cash holdings should lower the incentives to engage in income-increasing earnings manipulation.

### 4. Explained variable

Earnings management is proxied by discretionary accruals from the cash flow estimated accrual model from Dechow and Dichev (2002), which is further adjusted by McNichols (2002). The model is presented as follows:

$$TACC_{it} = \alpha_0 \frac{1}{Assets_{i,t-1}} + \alpha_1 \frac{CFO_{i,t-1}}{Assets_{i,t-1}} + \alpha_2 \frac{CFO_{i,t}}{Assets_{i,t-1}} + \alpha_3 \frac{CFO_{i,t+1}}{Assets_{i,t-1}} + \alpha_4 \frac{Sales_{i,t}}{Assets_{i,t-1}} + \alpha_5 \frac{PPE_{it}}{Assets_{t-1}} + \varepsilon_{it} \quad (2)$$

Where:

$TACC_{i,t}$  is the total accruals estimated following Dechow and Dichev (2002), which is the change in working capital minus depreciation, scaled by total assets.  $CFO_{i,t-1}$ ,  $CFO_{i,t}$ ,  $CFO_{i,t+1}$  is firm *i*'s operational cash flow for year *t-1*, year *t*, and year *t + 1*, respectively;  $Sales_{i,t}$  is the change in sales for year *t*; PPE is gross property, plant, and equipment for year *t*. All variables

are standardized by lagged total assets ( $Assets_{i,t-1}$ ) to ensure the comparability among firms in the sample.

The model is estimated separately for each industry-year group with at least 15 observations. Accruals-based earnings management (AEM) is measured as the value of the residual from Eq. (1).

We use dynamic modelling of earnings management behavior as in Cui et al. (2015), Doyle (2017), and Santana et al. (2019). It is advisable to employ System GMM to tackle the issue of intrinsic endogeneity emanating from the inclusion of lagged dependent variable as an explanatory factor (Roodman, 2009). This method makes use of a system of equations of levels and differences of variables to overcome the lack of empirical instruments for not only endogenous but predetermined variables. Furthermore, the use of System GMM may address the possible endogeneity caused by the omission of important variables or the two-way relationship between the dependent and independent variables (Roodman, 2009; Santana et al., 2019). System GMM is used for the estimation of dynamic models, with p values of autocorrelation tests and Hansen test provided to make sure that the results are valid for statistical interpretation.

## 5. Results and discussion

Tables 1 and 2 report descriptive statistics and correlation matrix for the variables used in our study. From Table 1, AEM has both negative and positive values, and as this study only focuses on income-increasing earnings management we will rely on to those whose values are positive. The ratios of short-term debt to total debt cover a wide range of value, from 0 to 1.

From Table 2, the signs of correlation coefficients are largely consistent with the expectations. Debtmat and MTB are negatively related to AEM, but this does not either constitute a valid basis for interpretation as correlation coefficients do not necessarily reflect impacts of a variable on another, or specify a more complex non-linear effect among those factors, or resolve endogeneity issue. Therefore, we continue with the regressions to test the hypotheses above.

Table 3 provides the result of the regression on the impact of the variables on earnings management. The significance of lagged AEM and the p-values of AR(2) and Hansen tests suggest that the instruments used are valid (Roodman, 2009). Shortdebtmat has a significantly negative coefficient, while shortdebtmat2 has a positive coefficient, suggesting that the non-linear U-shaped link between short-term debt and earnings management, consistent with hypothesis H1.

Earnings management has its own cost, so managers tend to refrain from employing it unless necessary. When firms have low levels of short-term debt, the tendency to engage in income-increasing accruals manipulation is lower. Lower levels of short-term debt are associated with

**Table 1. Descriptive statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
aem	4,527	0.000	0.136	-1.487	1.291
shortdebtmat	3,864	0.722	0.321	0.000	1.000
size	4,527	26.945	1.486	23.330	32.200
lev	4,527	0.235	0.195	0.000	0.883
mtb	4,146	0.906	0.933	-9.850	17.060
posprofit	4,527	0.952	0.215	0.000	1.000
roa	4,502	0.073	0.085	-0.790	0.840
boardsize	4,360	5.466	1.099	2.000	11.000
cash	4,527	0.146	0.153	0.000	0.974

Source: Authors' calculation from research data

**Table 2. Correlation matrix**

	aem	sdm	mtb	size	lev	roa	posprofit	cash	boardsize
aem	1.0000								
sdm	-0.0206	1.0000							
mtb	-0.0515	-0.0412	1.0000						
size	0.0774	-0.2519	0.1938	1.0000					
lev	0.0118	-0.1699	-0.0906	0.4144	1.0000				
roa	-0.1262	-0.0201	0.3737	-0.0492	-0.3543	1.0000			
posprofit	-0.0725	-0.0032	0.0893	0.0124	-0.0883	0.3796	1.0000		
cash	0.0137	0.0246	0.1679	-0.0816	-0.4046	0.4119	0.0976	1.0000	
boardsize	0.0149	-0.0834	0.1276	0.2785	0.065	0.0406	-0.0332	0.0285	1.0000

Source: Authors' calculation from research data. Sdm is shortdebtmat.

**Table 3. Regressions on the determinants of earnings management**

aem	Coef.	Std. Err.	t	P > t
L1.aem	0.374	0.011	33.720	0.000
shortdebtmat	-0.082	0.028	-2.930	0.004
shortdebtmat2	0.115	0.022	5.270	0.000
size	0.000	0.001	0.230	0.816
lev	-0.023	0.012	-1.910	0.056
mtb	0.024	0.002	11.470	0.000
roa	-0.220	0.025	-8.810	0.000
posprofit	-0.044	0.008	-5.780	0.000
cash	0.021	0.013	1.580	0.114
boardsize	-0.011	0.002	-6.010	0.000
_cons	0.126	0.032	3.920	0.000
Number of obs	1658			
AR(2) test (p val)	0.163			
Hansen test (p val)	0.117			

Source: Authors' calculation from research data

lower refinancing risk and liquidity risk, which increases the cost of earnings management for the purpose of falsely impressing debtholders. Therefore, at low levels of short-term debt, firms may be less likely to resort to income-increasing accruals management to avoid its costs.

On the other hand, at higher levels of short-term debt, refinancing risk and liquidity risk increase. Early liquidation could result in heavy and unrecoverable loss for firms so extreme risks should be avoided in the case of excessive short-term debt employment. In this scenario, firms may consider the cost of earnings management (litigation risk, or marketplace punishment) to be lower than its benefits, which enhances the firms' engagement in earnings manipulation.

MTB is positively related to AEM, or high-growth firms tend to employ earnings management, consistent with hypothesis H2. Firms with high growth opportunities are those that lack proper governance mechanisms (Andersen et al., 1993), having more uncertain cash flows and high risk associated with these investment opportunities set. These firms are also associated with higher levels of information asymmetry between firm management and outsiders. These factors create incentives for firms to take part in earnings management.

**Table 4. Regression for the model (1) with additional interaction variables**

	<b>low50</b>	<b>low30</b>	<b>hi70</b>
L1.aem	0.325*** (0.011)	0.313*** (0.010)	0.31*** (0.010)
shortdebtmat	-0.031 (0.031)	-0.097*** (0.028)	-0.161*** (0.025)
shortdebtmat2	0.046* (0.027)	0.097*** (0.023)	0.168*** (0.020)
mtb	0.015*** (0.003)	0.025*** (0.002)	0.017*** (0.002)
shortdebtmat*dummyMTB	-0.176*** (0.026)	-0.084*** (0.029)	0.124*** (0.029)
shortdebtmat2*dummyMTB	0.165*** (0.028)	0.100*** (0.030)	-0.102*** (0.032)
size	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)
lev	-0.037*** (0.010)	-0.037*** (0.011)	-0.041*** (0.011)
roa	-0.154*** (0.022)	-0.124*** (0.018)	-0.179*** (0.020)
posprofit	-0.059*** (0.006)	-0.062*** (0.006)	-0.057*** (0.006)
cash	0.055*** (0.012)	0.075*** (0.013)	0.051*** (0.012)
boardsize	-0.012*** (0.002)	-0.012*** (0.002)	-0.013*** (0.002)
_cons	0.193*** (0.029)	0.179*** (0.029)	0.178*** (0.027)
Number of obs	1658	1658	1658
AR(2) test (p val)	0.196	0.187	0.246
Hansen test (p val)	0.196	0.13	0.108

Source: Authors' calculation from research data. \*, \*\*, \*\*\* indicate significance at 10%, 5% and 1%, respectively.

Table 4 provides the results of the regressions with interaction variables, the dummy variable of MTB and shortdebtmat. We create three dummy MTB variables and use them in three models as in Table 4. In column Low50, the dummy MTB receives value of 1 when the firm has MTB value lower than the median of MTB of the sample, and 0 otherwise. Similarly, in column Low30, the dummy MTB receives value of 1 when the firm has MTB value that is in the lowest 30 percentile of MTB of the sample, and 0 otherwise. In Column Hi70, on the other hand, the dummy MTB receives value of 1 if the firm has MTB value in the top 30 percentile of MTB of the sample.

It is found that MTB, Shortdebtmat and Shortdebtmat2 variables still have the significant coefficients with sign consistent with those in Table 3, providing robust results for the findings of our study. For the Low30 and Low50 columns, the interaction shortdebtmat\_dummyMTB has negative coefficient while shortdebtmat2\_dummyMTB has positive coefficient, consistent with hypothesis H3. On the other hand, for the Hi70 column, the signs of these interaction variables are in the stark contrast. This evidence points out the importance of growth opportunities as a moderating factor in the link between shortdebtmat and AEM.

Low-growth firms tend to reduce earnings management at low levels of short-term debt, while increasing this type of manipulation at high levels. In contrast, high-growth firms reduce earnings management at high levels of short-term debt, compared to their low-growth counterpart. These patterns fit well with the prediction set in Hypothesis H3. The contrasting behavior may indicate the different characteristics associated with low- and high-growth firms.

## 6. Conclusion

The extant literature remains under-explored on the impact of short-term debt on accruals-based earnings management at low and high levels of short-term debt, and the impact of the interaction between the growth opportunities and short-debt maturity on accruals-based earnings management. This study seeks to examine the relationship between short-term debt maturity and accruals-based earnings management using a sample of listed firms in Vietnam from 2010–2017.

Our findings provide evidence suggesting that short-term debt maturity is more likely to exert desirable impact, lowering earnings management at low levels of short-term debt, while at high levels it tends to increase earnings manipulation, i.e. a U-shaped relationship. This provides a foundation for the reconciliation of the mixed results on the impact of short-term debt on earnings management.

Furthermore, we show that growth opportunities moderate the impact of short-debt maturity on earnings management. The U-shaped pattern between short-term debt and earnings management is more pronounced for firms with low growth opportunities, while for high-growth counterparts that pattern weakens. It is expected that firms with lower growth opportunities and low levels of short-term debt should have less incentives to engage in income-increasing earnings manipulation. Also, firms with high growth opportunities and high ratios of short-term debt aim to signal their quality and are less likely to inflate earnings.

The findings from this study suggest that short-term debt maturity does not simply impose a linear effect on earnings management. Corporate executives and firm stakeholders should be vigilant about the unfavorable impact which spurs income-increasing earnings management, exacerbating the information asymmetry between the firm and financial statement users. More monitoring should be in place to ensure that high levels of short-term debt employment are not a means to cover worsening financial health of the firms. This reiterates the importance of the access to long-term debt to tackle the adverse impact of short-term debt at its intensive use. The government could work around the collateral policy or provide guarantee where necessary to allow higher use of long-term debt. Furthermore, the finding that growth opportunities moderate the above U-shaped relationship between short debt maturity and earnings management implies different incentives such as signaling and financial distress masking. The implications provide hints for loan-making decision makers and investors in investigating the true intention of the firm when providing financing to the firm. For instance, the results suggest that debtholders should pay attention to the reliability of the financial statements of high-growth firms with low levels of short-term debt. Nonetheless, further analysis of other factors such as cash flow patterns and governance mechanisms should be incorporated into the analysis of the creditworthiness and potential development of the firm.

Future studies could proceed with the verification of the different motives of conducting earnings management for firms of different life cycle stages, because at each stage in the life cycle the growth pace of firms should differ. This should provide some implications to compare with our study.

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