
# Dividend Policy and Real Earnings Management

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**Abstract**

Prior research indicates that paying a cash dividend can be linked to both upward and downward earnings management as well as to earnings smoothing. While prior research mainly focused on the association between dividend policy and accrual-based earnings management, this research examines the role of dividend policy in real earnings management. This study investigates if (1) in general, dividend paying firms engage in more downward earnings management than non-dividend paying firms, (2) dividend paying firms engage in more real earnings smoothing than non-dividend paying firms and (3) dividend paying firms engage in more upward real earnings management than non-dividend paying firms to circumvent dividend restrictions in debt covenants. In line with the critical papers of Chen et al. (2018) and McNichols and Stubben (2018), this thesis utilizes both a one-stage and a two-stage approach to derive abnormal levels of the real earnings management proxies discretionary expenses and asset sales. With a sample of 12.144 firm-year observations during the period 2000-2019, the results indicate that dividend paying firms (1) generally engage in more upward real earnings management, (2) dividend paying firms engage in more earnings smoothing and (3) dividend paying firms manage engage in real earnings management do circumvent dividend restrictions in debt covenants. It is concluded that dividend paying firms do engage in real earnings management practices and although the behavior itself is not illegal, auditors and policymakers should take into account that having a dividend policy alters the behavior of management.

**Keywords:** Abnormal discretionary expenses, Asset sales, Debt covenant, Discretionary expenses, Dividend policy, Dividend paying firms, Persistent dividend payers, Pre-managed earnings, Real earnings management, Real earnings smoothing.

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# 1. Introduction

In the seminal paper of Lintner (1956), evidence has been found that managers target a long-term dividend payout ratio and a firm's dividends are tied to long-term sustainable earnings. Dividends are therefore sticky and smoothed over the subsequent years. In consequence, managers are reluctant to decrease dividend payments. Nowadays, research suggest that executives still have a strong desire to avoid dividend reductions and to smooth their dividend payments (Brav, Graham, Harvey and Michaely, 2005). For example, oil major Chevron Corp announced that it will issue debt and sell assets to preserve their dividend payments during the challenging year 2020 (Bary, 2020). Additionally, Total S.A. said it would reduce capital and operating expenditures to assure their dividend payments (Schaps, 2015). These examples are in line with Brav et al. (2005), who argue that executives are willing to sell assets and borrow additional capital to maintain dividend levels. Also, they emphasize that this mainly occurs for firms labeled as 'cash cows', who are committed to pay out a consistent and slowly growing dividend over the following years. Thus, it seems that corporate executives tend to engage in real economic actions just to maintain the dividend.

The existing literature has not agreed yet on the role of dividend policy in (real) earnings management. DeAngelo, DeAngelo, and Skinner (1994) argue that firms rather cut their dividends and do not make accounting changes to circumvent dividend restrictions in debt covenants. On the other hand, Daniel et al. (2008) argue that managers have an incentive to manage earnings upward to avoid dividend decreases when reported earnings are below expected dividend levels. They show that executives manage their earnings upwards when earnings fall short of prior dividend levels. Since the practice learns that firms are unwilling to cut dividends and take real actions to circumvent a dividend cut (Schaps, 2015; Bary, 2020), the role of dividend policy in real earnings management practices is a fertile area for academic research. Therefore, the research question of this study is as follows:

*Does dividend policy play a role in real earnings management?*

To examine the research question, financial statement data of listed firms in the United States for the sample period 2000-2019 are analyzed using ordinary least squares regression (OLS) models. Since the association between dividend policy and real earnings management is not clear, three hypotheses are examined. First, the general effect of a dividend paying status is examined. It is hypothesized that dividend paying firms engage in less real earnings management because the agency theory predicts stronger earnings quality and persistence of dividend paying firms. Second, the effect of paying a dividend on earnings smoothing is examined. The second hypothesis predicts that, based on survey evidence, dividend paying firms engage in real earnings smoothing. Finally, a situation is examined when dividend payers might engage more in upward earnings management than non-dividend paying firms. The third hypothesis predicts that dividend paying firms engage in more upward real earnings management in situations when the risk of violating a debt covenant is considerably. Dividend paying firms might have dividend restrictions in the debt covenants which provide more incentives for payers to engage in upward real earnings management.

To test the hypotheses, this research design attempts to better articulate the story by using three different proxies for real earnings management: abnormal discretionary expenses and asset sales. These proxies are chosen because they best articulate the story of what real actions managers in dividend paying firms would engage in (Schaps, 2015; Bary, 2020). To further enforce the research design, this research will use a two-stage (or residual) approach to derive abnormal discretionary expenses and a one-stage approach to derive abnormal discretionary expenses and asset sales. The two-stage model is being used to stay in line with prior research methods for comparison purposes. The one-stage models are used to

improve the research designs and to prevent incorrect inferences due to biased estimates. This is being done because recent papers critically evaluated the two-stage approach to derive dependent variables (Chen, Hribar, and Melessa, 2018).

For the first hypothesis, an indicator variable is analyzed taking the value of 1 if the firm paid a dividend in the prior year ($DIV_{t-1}$). For the second hypothesis, the same indicator variable ($DIV_{t-1}$) is analyzed in combination with the variable pre-managed earnings change (PMEC#) and the interaction term between these variables. For the third hypothesis, the indicator variable ($DIV_{t-1}$) is analyzed in combination with an indicator variable which takes the value of 1 if a firm has a high covenant risk (COVRISK) and their interaction term. Furthermore, the sample for the hypothesis 1 and 2 are identical while the sample for hypothesis 3 contains only firms with total debt higher than zero. To further strengthen the research design, additional tests are performed for every hypothesis by replacing indicator variable $DIV_{t-1}$ with an indicator variable taking the value of 1 if the firm paid a persistent dividend for 5 consecutive years in the sample period (PDIV). By this way, the research attempts to capture firms for which the dividend is of greater importance.

The findings of this study indicate that dividend paying firms engage in more upward real earnings management than their non-paying counterparts. This is against the idea that in general, dividend paying firms engage in less earnings management. However, the finding is not fully surprising since the strong controlling of discretionary costs might contribute to the fact that a firm is paying a dividend. Dividend paying firms are thus managing their cash flows more than non-payers to be able to pay out a dividend. Also, this study documents evidence that dividend paying firms engage in more earnings smoothing than non-payers, which is in line with prior survey evidence (Brav et al., 2005; Graham et al., 2005). Finally, this research finds evidence that dividend paying firms with a higher risk of violating a debt covenant engage in more upward real earnings management than non-dividend payers. Overall, it is found that having a dividend policy plays a pronounced role in real earnings management.

The answer to the research question will contribute to the literature on several aspects. First, the contradicting views regarding the association between dividend policy and earnings management provide an interesting area of research. Documenting new evidence with 21st century data would therefore be an important contribution. Second, it is hypothesized that dividend paying firms will engage in more real earnings management rather than accrual-based earnings management. This evidence would be rather new and therefore contribute the literature. Third, this research will study the role of dividend policy by analyzing whether dividend policy has a moderating effect on real earnings management. The association between dividend policy and real earnings management could either be positive or negative since motivations to manage earnings can either be linked to upward and downward earnings management. Fourth, the designs of prior research might suffer from biases because all of them are performed using two-stage estimation procedures to make inferences of earnings management behavior (Chen et al., 2018). This research attempts to better articulate the story and build a research design which fits incentives for real earnings management of dividend payers. Finally, this thesis documents different behavior of managers in dividend paying firms compared to managers in non-paying firms. Although the observed behavior is not illegal, auditors and policymakers should take into account that having a dividend policy alters managerial incentives and therefore its behavior.

The rest of this paper is organized as follows. Chapter two provides a review of the dividend literature and real earnings management literature. In chapter three, the three hypotheses are developed. Chapter four will present the research design including the final regression models and sample selection procedure. Chapter five discusses the main results and the additional tests. Chapter six provides a discussion of the results and an overall conclusion.

# 2. Background literature

This chapter will provide an overview of prior studies which are relevant to understand the role of dividend policy in real earnings management. First, the literature among dividend policy and its relevant concepts will be discussed. Second, an overview of the relevant earnings management literature is provided. Among this literature, first the concept of earnings management and managers' motivations to manage earnings are discussed. Thereafter, the concept of real earnings management is discussed backed by evidence from prior literature.

## 2.1 Dividend policy literature

The decision of the board of directors to either retain or pay out free cash flows in the form of dividend or share repurchases is referred to as the payout policy of a firm (Berk and DeMarzo, 2017). Consequently, the firm's payout policy is at the center of most questions in corporate finance. The amount which firms decide to pay out to its shareholders might affect the valuation and investment decisions of shareholders. Also, payout policy might inform the market about the firm relative to its peers (Farre-Mensa, Michaely, and Schmalz, 2014). Farre-Mensa et al. (2014) argue that, in imperfect markets, governance problems, incomplete contracts and other market frictions can lead to value-destroying payout decisions. From these market imperfections, theories such as dividend smoothing, dividend signaling and agency costs are derived. But, before the relevant theories are discussed, it is important to shed light on one of the seminal papers regarding payout policy decisions by Miller and Modigliani (1961). They argue that a firm's payout policy is irrelevant for the share value of the firm. That is because buying or selling shares are zero-NPV transactions which do not affect share prices in perfect capital markets. Shareholders can therefore sell their shares to create their own dividends. Modigliani and Miller (1961) thus argue that it is not the payout policy, but the underlying cash flows that determines the share price of the firm. Their important proposition is as follows: *"In perfect capital markets, holding fixed the investment opportunity, the firm's choice of dividend policy is irrelevant and does not affect the initial share price"*. Thus, this theorem implicates that management should not bother about their payout policy in perfect markets, since investors will not pay a premium for the payout policy.

### *2.1.1 Dividend smoothing*

In practice and contrary to the prediction of Miller and Modigliani, it is observed that corporate executives tend to engage in dividend smoothing behavior. Dividend smoothing is referred to as the practice of maintaining relatively constant dividend payments (Berk and DeMarzo, 2017). The early survey evidence of Lintner (1956) provided evidence for this behavior. He surveyed corporate executives of a diverse group of 28 dividend paying firms for 7 consecutive years. The results of his study suggest that management assumes that equity investors prefer stable and slowly growing dividend payments. Under this assumption, managers are reluctant to cut dividends and they therefore try to smooth dividends and target a long-term sustainable payout ratio (Lintner, 1956). Firms will only increase dividends when management expects future earnings to increase sustainably and only cut them when absolutely necessary. Lintner concludes that executives assume that the market puts a premium on a stable dividend payout policy and that executives target their latest dividend per share payout. Several decades later, Brav et al. (2005) conducted another survey among corporate executives and confirmed the evidence of Lintner (1956) that maintaining a stable dividend is of main importance. Managers even considered selling assets, borrowing heavily and bypassing positive NPV projects only to avoid a dividend cut (Brav et al., 2005). Thus, a firm's payout policy is clearly affecting decision making of corporate executives.

### *2.1.2 Dividend signaling*

The irrelevance of the dividend irrelevance theorem can be derived from its assumptions. The proposition states that markets are perfect under the assumption of symmetric information among market participants. Additionally, the proposition assumes that complete contracting possibilities exist. In reality, these assumptions often do not hold and it is the imperfections in capital markets that determine a management's decisions regarding payout policy (Berk and DeMarzo, 2017; Farre-Mensa et al., 2014). The first market imperfection is information asymmetry between managers and shareholders. Managers have superior information compared to investors regarding the future earnings and cash flows of the firm. This information asymmetry is the foundation for the dividend signaling hypothesis. This concept states that: a dividend change contains information about the future profitability of the firm which is being 'signaled' by the firm's management (Berk and DeMarzo, 2017). Thus, when a firm increases (decreases) its dividend, management sends a positive (negative) signal to investors about future prospects. In line with the theory, prior empirical research has shown that for firms who raise their dividends, the stock price reacts positively and for firms who decrease its dividends, the stock price reacts negatively (Grullon, Michaely, and Swaminathan, 2002). The effect is even more pronounced for dividend initiations and omissions (Michaely, Thaler and Womack, 1995). Besides the fact that a dividend increase (decrease) usually signals managements optimism (pessimism) regarding the future, a dividend might also signal information about investment opportunities. If management sees no opportunity to invest its excess cash, a payout in the form of a (special) dividend might be initiated. In sum, the dividend signaling theory implicates that executives can mitigate information asymmetries via its dividend policy.

### *2.1.3 Dividends and agency costs*

Information asymmetry is the root of agency problems and conflicts of interest. Many of the potential conflicts of interest between management and shareholders have an interaction with the firm's payout policy. The agency cost theory of dividends (or free cash flow problem) can be explained in two ways. First, Jensen (1986) explains that dividends can be used as a tool to prevent managers to behave in value destroying behavior for the firm. Dividend payouts reduce cash of the firm which limits the possibilities of managers to misuse this cash (e.g. fewer abilities to consume personal benefits). A second point addressed by Jensen (1986) points out that dividends can be employed to make sure the management of a firm works dedicated in the interests of the investors by ensuring there remains a focus on profitable projects (e.g. fewer abilities to invest in negative NPV projects). In general, the paid out dividends limit the opportunities of management to engage in value destroying behavior and consequently make sure that managers make decisions in the best interest of the firm.

### *2.1.4 Management's view on dividends*

By surveying and conducting field interviews among corporate executives of 256 listed firms and 128 private firms, Brav et al. (2005) augmented the existing evidence regarding payout policy. They found that ninety percent of dividend paying firms have a strong desire to avoid a dividend reduction and prefer a smooth dividend. Additionally, eighty-four percent tried to maintain consistent with the prior dividend level. It is important to note that the reluctance among managers to reduce the dividend and the pressure to maintain a steady growing dividend is more severe for firm labeled as cash cows. For these firms, the signaling theory seems to hold, since managers stated they would pass positive NPV projects to maintain the prior dividend level. Also, the findings show that managers do believe that dividend decisions convey information to the market. Executives think that a dividend increase is viewed as a risk reduction and thus could be related with positive share returns. Overall, it is concluded that the historical dividend is an important target and managers believe dividend policy is value-relevant (Brav et al., 2005).

## 2.2 Earnings management literature

To understand the concept of real earnings management, it is important to first understand the full concept of earnings management. Earnings management is a broad concept which has many different definitions in the academic literature. Schipper (1989) define it negatively as *"purposeful intervention in the external reporting process, with the intent of obtaining some private gain"*. In contrast, McKee (2005) defines it more positively as *"reasonable and legal management decision making and reporting intended to achieve stable and predictable financial results"*. The general and widely accepted definition has been stated by Healy and Wahlen (1999). They define earnings management as *"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"*. According to Healy and Wahlen (1999), earnings management can either be motivated by efficient markets and contracts or by opportunism and rejection of market efficiency. The former means that managers can use their discretion to increase the value relevance of financial reporting. The latter holds that managers are also able to use discretion to manipulate earnings to favorably influence certain outcomes. The widespread use of accounting numbers for decision making creates numerous incentives for managers to engage in earnings management.

### *2.2.1 Motivations to manage earnings*

Healy and Wahlen (1999) describe three broad motivations for executives to engage in earnings management. The first type of motivation are the capital market motivations. Accounting numbers are generally value relevant and investors and financial analysts therefore make use of accounting information to make decisions[1]. Healy and Wahlen (1999) summarize that evidence has been found that managers engage in earnings management prior to management buyouts, prior to equity offers and, most importantly, to meet or beat market expectations. The second type of motivation are the contracting motivations. Accounting numbers are widely used in different type of contracts. Two contracts exist which are interesting for accounting research: lending contracts and management compensation contracts. Lending contracts usually constrain managers to payout dividends at the expense of the firm's creditors and debt providers. These restrictions are often included in debt covenants and managers have clear incentives to manage earnings so they won't violate this debt covenant. Management compensation contracts usually determine the variable amount of remuneration of executive. More favorable accounting numbers will lead to higher executive compensation, which gives a motivation to manage earnings upward. The third type of motivation to manage earnings is the regulatory or political motivation. Healy and Wahlen (1999) state that two forms of regulation are explored by the accounting literature: industry regulation and anti-trust regulation. Earnings management for industry regulation can for example be observed in the banking industry. Banks are reclassifying financial assets and managing their earnings as a response to capital restrictions following the financial crisis. Political and anti-trust regulation can also be a motivation for earnings management. Jones (1991) find for example that earnings are managed downward to gain an import relief. In sum, capital market, contracting and political motivations provide organizations to manage their earnings for favorable outcomes.

### *2.2.2 Real earnings management*

The academic literature distinguishes between two types of earnings management: Accrual-based earnings management and real (activities) earnings management. According to Roychowdhury (2006), accrual-based earnings management is the type of earnings management in which discretionary accruals are manipulated with no direct cash flow effects. For example, taking fewer provisions for bad debt

[1] Nichols and Wahlen (2004) provided evidence regarding the value relevance of accounting numbers for investors.

expenses and delaying asset write-offs. On the other hand, Roychowdhury (2006, p. 337) define real earnings management as *"departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations"*. Within this type of earnings management, operational decisions are being manipulated to accelerate short-term profit. For example, acceleration of sales through aggressive discounts, alterations in shipment schedules and delaying R&D and/or maintenance expenditures. Consequently, this type of earnings management does influence the operating cash flows of a firm.

### *2.2.3 Evidence of real earnings management*

The concept of real earnings management has been widely researched. Especially the real earnings management tool regarding the discretionary expenditures of a firm. Roychowdhury (2006) assessed whether firms use real earnings management to avoid reporting a loss or to meet or beat analysts' benchmarks. Using a residual model to assess abnormally low discretionary expenses, they confirm their hypothesis that firms try to meet or beat analyst benchmarks by delaying discretionary expenditures. Another interesting research providing evidence for real earnings management has been carried out by Dechow and Sloan (1991). They analyzed 405 firms operating in the manufacturing industry with significant R&D spending. They identified CEO's in their final year of service which have a decreased amount of R&D expenditures as suspected for real earnings management. The findings confirm that CEO's in their final year of tenure spent significantly less in order to improve short-term earnings. More evidence can be found in the research of Baber, Fairfield, and Haggard (1991). They analyzed 438 industrial firms of which the R&D expenses are significant compared to their revenues. They hypothesized that, if the current year R&D spending decrease compared to the prior year and the difference helped the firm to meet the analyst benchmark, the firm is assumed to have used real earnings management to meet or beat their analysts' targets. They confirm their hypothesis and found that R&D spending is significantly less when the spending jeopardizes the ability to report positive or increasing earnings for the current year. Additionally, Perry and Grinaker (1994) analyzed 99 firms operating with large R&D expenses. They used a model in which they derived unexpected R&D spending and analyzed this measure by comparing it with analysts' benchmarks. The results show that firms tend to cut R&D expenditures if their profits fall short of analysts' benchmarks. Moreover, Gunny (2005) analyzed a large sample of firm years that have constraints in their ability to make use of accruals to manage their earnings. They found that these specific firms inflate their earnings using discretionary expenditures such as SG&A spending. In sum, prior research provides guidance for the fact that firms use discretionary expenditures such as R&D expenses as well as SG&A expenses to manage their earnings.

# 3. Hypotheses development

In this chapter, the payout policy literature and the earnings management literature are combined with related literature to derive hypotheses regarding the role of dividend policy in real earnings management. First, a hypothesis regarding dividend paying status will be derived from prior research and the background literature. Second, the hypothesis regarding earnings smoothing of dividend payers will be explained. Finally, the hypothesis regarding the possibility of upward earnings management of dividend payers will be deducted from the literature.

## 3.1 Dividend paying status and real earnings management

Whether a dividend paying status plays a role in earnings management, can be derived from the agency costs theory of dividends. According to He, Ng, Zaiats and Zhang (2017), managers use dividends as a means to resolve agency problems between shareholders and management. They argue that dividend policy may be the outcome of an efficient (implicit) contracting situation under which shareholders force the company insiders to disgorge cash and thereby limiting potential suboptimal behavior of managers. Firms that pay a dividend have limited the private control benefits of managers since the excess cash within the firm has been (or has to be) paid out. Managers cannot consume these cash flows themselves by paying out higher bonuses or perks and it is therefore expected by He et al. (2017) that a dividend paying status indicates better earnings quality. This line of reasoning is therefore in line with contracting motivations in the earnings management literature. Their results confirm their expectations and they document a negative association between dividend policy and earnings management.

Additionally, Tong and Miao (2011) analyzed the relation of a dividend paying status and earnings management. They provide additional evidence for the idea that dividends mitigate the costs of agency conflicts. They argue that dividends increase the likelihood that managers have to raise external financing, which in turn would lead to closer monitoring of managers by investment banks and other institutions. This higher degree of monitoring by capital market participants leads to higher earnings quality and therefore lower levels of earnings management. This line of reasoning is in line with capital market motivations in the earnings management literature. Moreover, Tong and Miao (2011) argue that it is costly for executives to support cash dividends with net income numbers which are not appropriately reflecting underlying firm performance. Since cash flows are required to payout these dividends, earnings should be in line with realized cash flows to pay out these cash flows. If executives decide to payout cash flows without underlying firm performance, their firm might get into distress because of the additional lending and financing activities needed to payout dividends. Ultimately, the empirical findings of Tong and Miao (2011) confirm their hypothesis and found that dividend paying firms have higher earnings quality.

More evidence for the earnings quality of dividend payers can be derived from the study of Skinner and Soltes (2011). They test the hypothesis that dividends in particular allow investors to assess the persistence of a firm its earnings. Their findings suggest that the relation between current and future earnings is stronger for firms that pay a dividend. The evidence that the earnings of dividend payers are more persistent, could be an indication that these dividend paying firms do not have artificially (upward managed) earnings.

The research of He et al. (2017), Tong and Miao (2011) and Skinner and Soltes (2011) provide a clear indication that a dividend paying status is associated with lower levels of earnings management. Still, the studies of He et al. (2017) and Tong and Miao (2011) focus mainly on accrual-based earnings management. However, this research design does not fully fit the fact that dividends are cash payouts and therefore the link should be stronger for real earnings management proxies. These proxies are

directly linked with cash flows and are therefore a more reliable proxy to measure opportunistic behavior related to dividend policy. The first hypothesis in this research is as follows:

***H1: Dividend paying firms engage in less real earnings management than firms which do not pay dividends.***

## 3.2 Dividend payers and real earnings smoothing

Although it might be the case that a dividend paying status will in general have a positive effect on the earnings quality of firms. It might also be the case that a dividend paying status brings other incentives to firms that might motivate managers to engage in either upward earnings management or earnings smoothing. This idea can be derived from prior empirical research. For example, Graham, Harvey, and Rajgopal (2005) found that managers would rather take economic actions that could have negative long-term implications than using accruals to manage earnings. A large portion (78%) admits sacrificing long-term value to smooth earnings over time. These findings suggest that earnings smoothing is a common phenomenon among firms. In line with this, the dividend policy literature dictates that dividend paying firms try to smooth their dividend payments and engage in real actions to avoid cutting their historical dividend payments. The prior dividend level and the target payout ratio are important capital market benchmarks for dividend paying firms (Brav et al., 2005). Thus, it might be the case that earnings smoothing and dividend smoothing occurs for the same firms.

Liu and Espahbodi (2014) hypothesized that earnings smoothing is more pronounced for dividend paying firms which also have a desire to smooth their dividend payments. They build a research design which tests whether dividend paying firms that have pre-managed earnings increases (decreases) will manipulate earnings downward (upward). By this way, they analyze firms which are not pressurized to change their dividends because of the positive earnings fluctuation and can, consequently, maintain their prior dividend level and payout ratio. The researchers confirm their hypothesis that firms engage in both accrual-based earnings management and real earnings management in the contrary direction of the pre-managed earnings change. They conclude that dividend policy has an incremental effect on earnings smoothing and provide evidence that dividend policy plays a smoothing role in earnings management.

Prior survey research (Graham et al., 2005; Brav et al., 2005) in combination with prior empirical work (Liu and Espahbodi, 2014) suggest that dividend paying firms smooth their earnings to meet historical dividend payments and therefore avoid dividend cuts. Because real actions are directly linked with cash flows, this research will analyze whether the findings hold for real earnings smoothing proxies. The following hypothesis will analyze whether a dividend paying status plays a role in real earnings smoothing:

***H2: Dividend paying firms engage more in real earnings smoothing than non-dividend payers.***

## 3.3 Dividend payers and upward real earnings management

Prior research also found evidence that, for dividend paying firms, situations exist when they will engage in upward earnings management. With a large sample of US firms, Daniel et al. (2008) investigated whether managers treat expected dividend levels as an important capital market benchmark. They tested the hypothesis that firms manage earnings upward when pre-managed earnings fall short of expected total dividend payments. One of their main arguments for why managers consider the prior dividend level as an important benchmark is the existence of debt covenants. Debt covenants could restrict dividend payouts and these restrictions could have negative consequences for the firm[2]. The line of reasoning can therefore be classified as either a capital market or a contracting motivation. The findings

[2] Recall that Grullon et al. (2002) found an abnormal negative stock price reaction following a dividend cut.

of Daniel et al. (2008) confirm their initial thoughts. For firms with positive debt, managers engage in upward earnings management when pre-managed earnings fall short of prior dividend levels. They conclude that the prior dividend level is indeed an important benchmark for dividend paying firms with positive debt.

Atieh and Hussain (2012) confirm the hypothesis of Daniel et al. (2008) for dividend paying firms in the United Kingdom. They find that dividend paying firms are more likely to manage earnings upwards than non-payers when pre-managed earnings fall short of expected dividends. An important addition in their hypothesis development is the fact that the restrictions in debt covenants are largely based on earnings metrics (Atieh and Hussain, 2012). Examples of important triggers in debt covenants for US firms are debt-to-EBITDA, debt-rating and the interest coverage ratio (Begley and Freedman, 2004; Asquith, Beatty, and Weber, 2005; Corporate Finance Institute, 2020). This enforces the link between dividend policy and earnings management since higher earnings for dividend paying firms might help circumventing the restriction in the debt covenant. Moreover, Begley and Freedman (2004) note that dividend paying firms usually have 'a pool of dividends'. Of this pool, losses are deducted for 100 per cent while net income is added for only 50 per cent. This provides another motivation for upward earnings management for dividend payers.

Begley and Freedman (2004), Daniel et al. (2008) and Atieh and Hussain (2012) provide evidence that dividend restrictions in debt covenants present clear reasons why dividend paying firms engage in upward earnings management. Still, there remains doubt in the academic literature if it is the dividend policy that drives this earnings management. Kim, Lee and Lie (2017) argued that the paper of Daniel et al. (2008) suffers from endogeneity issues. They show that the evidence is not robust when they control for firms' motivation to manage earnings upward to simply avoid earnings declines. The authors conclude that firms with dividend constraints are more likely to cut dividends rather than to engage in upward earnings management and therefore refute the findings of Daniel et al. (2008). Whether dividend policy plays a role in upward earnings management remains questionable. Prior research again focused primarily on accrual-based earnings management for these dividend paying firms. In this research it is hypothesized that dividend paying firms engage in more upward real earnings management than non-dividend paying firms to circumvent restrictions in debt covenants. The hypothesis is stated as follows:

***H3: Dividend paying firms engage in more upward real earnings management than non-dividend payers to circumvent restrictions in debt covenants.***

# 4. Research Design

In this chapter, the research design will be explained. One of the cornerstones in this research is the concept real earnings management. This chapter will start off by explaining the choices which are made regarding the measurement of real earnings management. Next, the independent variables of the three hypotheses will be explained. Later, the control variables for this research are introduced. Afterwards, the regression models for the three hypotheses are provided. Finally, the data sources and sample selection procedures are explained.

## 4.1 Operationalizing real earnings management

In the academic literature, earnings management is often measured using the accrual model developed by Jones (1991) or one of its widely used modified versions by Dechow, Sloan and Sweeney (1995). The main premise of these models is to identify estimates of unexpected accruals of which the researchers can derive managements' discretion in financial reporting. These estimates are called discretionary accruals and are the residuals of a regression model which estimates the normal non-discretionary accruals.

In this research, the dependent variable of all the hypotheses should capture the level of real earnings management. Since it is expected that a dividend policy will more likely affect real activities (Schaps, 2015), it is decided to operationalize real earnings management with the level of abnormal discretionary expenses. Simultaneously, prior research provides guidance for using abnormal discretionary expenses as a proxy for real earnings management (Roychowdhury, 2006; Liu and Espahbodi, 2014). Thus, to stay in line with prior research, my first proxy for real earnings management are the abnormal discretionary expenses. From the following model of Roychowdhury (2006), the residuals ($\varepsilon$) are used to derive the abnormal discretionary expenses:

$$\frac{DISEXP_{it}}{Assets_{it-1}} = \alpha_0 + \alpha_1\left(\frac{1}{Assets_{it-1}}\right) + \alpha_2\left(\frac{Sales_{it-1}}{Assets_{it-1}}\right) + \varepsilon_{it} \qquad \text{(A)}$$

Discretionary expenses are the sum of advertising expenses, research and development (R&D) expenses, and selling, general and administrative (SG&A) expenses for firm *i* in year *t*. The 'normal' discretionary expenses are a function of a scaled intercept $\left(\frac{1}{Assets_{it-1}}\right)$ and lagged total sales $\left(\frac{Sales_{it-1}}{Assets_{it-1}}\right)$ to capture economic events driving expenses. Lagged total sales are used (instead of contemporaneous sales) to tackle the following problem: if sales are managed upward to increase reported earnings in any year, they can have extraordinarily low abnormal discretionary expenses if the residuals of a regression model with contemporaneous total sales is used (Roychowdhury, 2006). The model to derive the abnormal discretionary expenses can thus be reformulated as follows:

$$\varepsilon_{it} = ADISX_{it} = \frac{DISEXP_{it}}{Assets_{it-1}} - \alpha_0 - \alpha_1\left(\frac{1}{Assets_{it-1}}\right) - \alpha_2\left(\frac{Sales_{it-1}}{Assets_{it-1}}\right) \qquad \text{(B)}$$

Regression model A is estimated for each two-digit SIC code. Overall, the abnormal discretionary expenses (ADISX) should capture the concept of real earnings management since firms that manage earnings upward are expected to have unusually low discretionary expenses (Roychowdhury, 2006).

Nevertheless, many critical papers exist regarding the research designs in the earnings management literature. The critical notes are mainly regarding the use of residuals as the dependent variable to capture

the concept of real or accrual-based earnings management. Chen et al. (2018) criticized this two-step procedure and showed that the procedure of using residuals generates biased coefficients which could possibly lead to incorrect inferences. Additionally, Christodoulou, Ma, and Vasnev (2018) confirm the hypothesis that the inferences from residuals suffer from considerable systematic biases. On top of that, Jackson (2018) expresses three more problems with residual measures of accruals or expenses: (1) discretionary accruals or expenses are affected by peer firms, (2) the models produce implausible amounts of discretionary accruals or expenses relative to the amount of earnings and (3) discretionary accruals or expenses are not related to known cases of earnings manipulation.

Fortunately, the critical papers provide suggestions to improve the research designs and maximize the validity of earnings management studies. For example, Chen et al. (2018) propose to solve the problem of using residual measures by using a single regression to estimate the effect of a certain variable on the amount of accruals. Instead of controlling for regular business affairs to estimate discretionary accruals, they argue it is better to combine the control variables of the two regressions into one comprehensive regression including year- and industry fixed effects and their interactions with the first step regressors. In line with their advice, this research will make use of discretionary expenses (DISX) as a second proxy for earnings management without separating the expected and the unexpected part with a two-step procedure. Thus, to improve the validity of the research, one single comprehensive regression model will be tested where the dependent variable will be the regular level of discretionary expenses.

Additionally, McNichols and Stubben (2018) provided more suggestions to improve the research designs of earnings management studies. One of these suggestions is that academics could make more specific predictions about how, when and where management discretion might appear. So, researchers should more comprehensively articulate the economic story to enhance the research design. This research aims to better articulate the story of why dividend policy plays a role in real earnings management by choosing the proxies which are more closely to managerial behavior in practice (Schaps, 2015; Bary, 2020). So, to further triangulate, this research will add the proxy asset sales (ASSETSALES) to measure real earnings management. This proxy is chosen because it is (1) more closely to managerial behavior in reality (Schaps, 2015; Bary, 2020) and (2) examples of debt covenants exist in which proceeds of asset sales must be fully used to pay down debt (Asquith et al., 2005, p. 127).

In summary, the research will make use of three different proxies for real earnings management. First, the abnormal discretionary expenses (ADISX) which are derived from the residuals of equation 1. Second, the discretionary expenses (DISX) scaled by lagged total assets to make sure no incorrect inferences are drawn. Finally, the amount of asset sales scaled by lagged total assets (ASSETSALES) will be measured to better align the research with managerial behavior in reality and to further triangulate the results.

## 4.2 Independent variables

The first hypothesis aims to test whether firms that pay a dividend engage in less real earnings management than firms that do not pay a dividend. To test this hypothesis, the first independent variable of interest will be an indicator variable which takes the value of 1 if the firm paid a dividend in year *t-1* and 0 otherwise ($DIV_{t-1}$). Additionally, another regression model will be analyzed with an independent dummy variable which takes the value of 1 if the firm has paid a dividend for 5 consecutive years in the sample period and 0 otherwise[3] (PDIV). By this way, the research aims to capture the firms which have a clear dividend policy and for which a dividend reduction or omission would be a more difficult decision for the firm's management. It is therefore expected that the magnitude of the coefficients for

[3] The value of 5 years has been taken in accordance with the research of Tong and Miao (2011).

persistent dividend payers will be larger. Furthermore, it is expected that dividend paying firms engage in less real earnings management compared to non-paying firms. In other words, dividend paying firms are expected to have higher levels of discretionary expenses than non-paying firms. Thus, the coefficients of both the independent variables ($DIV_{t-1}$ and PDIV) are expected to be positive for the (abnormal) discretionary expenses proxy. Moreover, it is expected that lower levels of real earnings management represent lower levels of asset sales. Thus, the coefficients of $DIV_{t-1}$ and PDIV are expected to be negative for the asset sales proxy.

The second hypothesis aims to test whether dividend paying firms engage in more earnings smoothing. The independent variables to test this hypothesis are in line with the research design of Liu and Espahbodi (2014). This research will test the interaction effect between a dividend paying status ($DIV_{t-1}$ or PDIV) and the variable pre-managed earnings change (PMEC#). The variable pre-managed earnings change is calculated as the earnings change plus the amount calculated for the dependent variable abnormal discretionary expenses and discretionary expenses and minus the amount of asset sales[4]. This variable is thus a model specific variable and the '#' denotes either plus ADISX, plus DISX or minus ASSETSALES for the corresponding model. Furthermore, if the pre-managed earnings change is positive, it is expected that managers who try to smooth their earnings will engage in downward real earnings management. This indicates that they will incur lower levels of asset sales and incur higher (abnormal) discretionary expenses. Thus, the expected sign for (abnormal) discretionary expenses is positive and the expected sign for the asset sales is negative.

The third hypothesis aims to test whether dividend paying firms engage in more upward real earnings management than non-dividend paying firms to circumvent debt covenants restrictions. To test this, an interaction variable is added to the regression model between indicator variable $DIV_{t-1}$ (or PDIV) and an indicator variable which takes the value of 1 if the interest coverage ratio is equal or below two (COVRISK)[5]. This variable is chosen because prior research indicates that the interest coverage ratio is one of the most widespread accounting measures included in debt covenants (Begley and Freedman, 2004; Asquith et al., 2005; Greenwald, 2019; Corporate Finance Institute, 2020). More specifically, Begley and Freedman (2004) report that in dividend covenants, the minimum value of the interest coverage ratio is set at two where lower values imply a dividend restriction. Also, the maximum ratios (e.g. interest coverage ratio of 2) included in debt covenants are stable over time (Greenwald, 2019, p.2). This provides academic backing of the chosen value of two for creating the indicator variable COVRISK. Overall, it is expected that a dividend paying firm with a high covenant risk (e.g. interest coverage ratio falls below two) will engage in upward real earnings management and therefore the expected sign is negative for the (abnormal) discretionary expenses model and positive for the asset sales model.

## 4.3 Control variables

McNichols and Stubben (2018) argue that no definitive list of control variables exist for (real) earnings management studies because the differences between the treatment and control group are contingent to the situation. Still, they argue that when including control variables, two important aspects should be taken into account. The first aspect states that control variables should capture underlying economic forces reflected in a firm's earnings absent discretion and other factors that could contribute to discretion beyond the factor hypothesized. Second, the control variables included should not capture the effect of the variable of interest. This research will try to take these aspects into account when selecting the

[4] Since discretionary expenses negatively affect earnings, they must be added up to the earnings change. On the other hand, asset sales positively impact earnings and should therefore be subtracted.

[5] Interest coverage ratio is calculated as a firm earnings before interest, tax, depreciation and amortization (EBITDA) divided by total interest expenses.

control variables. Furthermore, the control variables which are included are derived from evidence of prior research and will be made specific for each hypothesis.

First of all, a set of control variables are included which are proven to be associated with earnings management incentives. The first control variables will therefore include the stock incentive ratio (STOCK) and executives bonus ($BONUS_{t-1}$) to capture the effect of compensation incentives for the firm's executives (Bergstresser and Philippon, 2006). Also, the firm's leverage (LEV) is included to capture effects of debt covenant restrictions. These variables control for contracting motivations to manage earnings. Additionally, the variables institutional ownership percentage (INST) and analyst following (ANALYST) are included to control for capital market motivations to manage earnings (Roychowdhury, 2006; Tong and Miao, 2011; McNichols and Stubben, 2018).

Moreover, a set of control variables are included to control for the characteristics of dividend paying firms (Tong and Miao, 2011). These control variables also control for the underlying economic forces reflected in the firm's earnings. Fama and French (2001) classify firm size, profitability and growth prospects as important factors for dividend paying firms. So, the natural logarithm of total assets (SIZE), return on assets (ROA), a dummy variable for whether the firm incurred a loss (LOSS) and book-to-market ratio (BTM) are included. Also, a set of control variables will be included to control for the maturity of the firm. According to DeAngelo, DeAngelo, and Stulz (2006), firms are more likely to pay dividends as they mature. Thus, this research will control for the firm age (AGE) and the sales growth (GROWTH). Finally, the variable retained earnings (RE) and cash flow from operations (CFO) are included to capture the ability to pay dividends. The rationale behind the addition of the retained earnings variable is that it might be a noisy proxy for the "inventory" of earnings which could be distributed as dividends (Daniel et al., 2008).

Additionally, it is important to note that the second and third proxy for real earnings management are measured using a one-stage approach. According to Chen et al. (2018), this approach requires to combine the variables of the first and the second stage regressions. Therefore, a scaled intercept $\left(\frac{1}{Assets_{it-1}}\right)$ and the variable lagged total sales $\left(\frac{Sales_{it-1}}{Assets_{it-1}}\right)$ are added to control for normal business activity affecting discretionary expenses. Also, to agree with Chen et al. (2018), a set of year- and industry fixed effects and their interaction terms with the independent variables of the first stage regression (A) are added to the models. That is, because the residual measures are derived using industry-year regressions to estimate normal and abnormal discretionary expenses (Roychowdhury, 2006).

Since each hypothesis is unique, the control variables should be adjusted according to the hypothesis. Regarding the first hypothesis, all the control variables which are mentioned above are included in the regression model. Therefore, no further explanation is necessary. Regarding the second hypothesis, the variable of interest is the interaction term between pre-managed earnings change and dividend paying firms. To prevent controlling for the variable of interest, the control variable return on assets (ROA) and the loss making dummy (LOSS) are not included since these are related to the firm's results. Regarding the third hypothesis, the variable of interest is the covenant risk for dividend paying firms. To prevent controlling for the variable of interest, the control variable leverage (LEV) is not included since this variable is related to the firm's risks of violating a debt covenant.

## 4.4 Regression models

To summarize the above discussion, this paragraph will provide the regression models which will be tested. Each regression model will be tested over by substituting the independent variable $DIV_{t-1}$ by PDIV. It is expected that real earnings management is more pronounced for firms paying a persistent dividend. In the appendix, table 14 provides a description of each variable and the corresponding Libby

boxes are included (figure 1, 2 and 3). The regression models which are going to be analyzed are tabulated in table 1, 2 and 3.

**Table 1: Regression Models Hypothesis 1**

| Model | Equation |
|---|---|
| (1) | $ADISX = \beta_0 + \beta_1 DIV_{it-1} + \beta_x Controls + \gamma_x Fixed\ Effects + \varepsilon_{it}$ |
| (2) | $DISX = \beta_0 + \beta_1 DIV_{it-1} + \beta_2 \left(\frac{1}{Assets_{it-1}}\right) + \beta_3 \left(\frac{Sales_{it-1}}{Assets_{it-1}}\right) + \beta_x Controls + \gamma_x INTERACTIONS + \varepsilon_{it}$ |
| (3) | $ASSETSALES = \beta_0 + \beta_1 DIV_{it-1} + \beta_2 \left(\frac{1}{Assets_{it-1}}\right) + \beta_3 \left(\frac{Sales_{it-1}}{Assets_{it-1}}\right) + \beta_x Controls + \gamma_x INTERACTIONS + \varepsilon_{it}$ |

**Table 2: Regression Models Hypothesis 2**

| Model | Equation |
|---|---|
| (4) | $ADISX = \beta_0 + \beta_1 DIV_{it-1} + \beta_2 PMEC\#_{it} + \beta_3 PMEC\#_{it} * DIV_{it-1} + \beta_x Controls + \gamma_x\ Fixed\ Effects + \varepsilon_{it}$ |
| (5) | $DISX = \beta_0 + \beta_1 DIV_{it-1} + \beta_2 PMEC\#_{it} + \beta_3 PMEC\#_{it} * DIV_{it-1} + \beta_4 \left(\frac{1}{Assets_{it-1}}\right) + \beta_5 \left(\frac{Sales_{it-1}}{Assets_{it-1}}\right) + \beta_x Controls + \gamma_x INTERACTIONS + \varepsilon_{it}$ |
| (6) | $ASSETSALES = \beta_0 + \beta_1 DIV_{it-1} + \beta_2 PMEC\#_{it} + \beta_3 PMEC\#_{it} * DIV_{it-1} + \beta_4 \left(\frac{1}{Assets_{it-1}}\right) + \beta_5 \left(\frac{Sales_{it-1}}{Assets_{it-1}}\right) + \beta_x Controls + \gamma_x INTERACTIONS + \varepsilon_{it}$ |

**Table 3: Regression Models Hypothesis 3**

| Model | Equation |
|---|---|
| (7) | $ADISX = \beta_0 + \beta_1 DIV_{it-1} + \beta_2 COVRISK_{it} + \beta_3 COVRISK_{it} * DIV_{it-1} + \beta_x Controls + \gamma_x Fixed\ Effects + \varepsilon_{it}$ |
| (8) | $DISX = \beta_0 + \beta_1 DIV_{it-1} + \beta_2 COVRISK_{it} + \beta_3 COVRISK_{it} * DIV_{it-1} + \beta_4 \left(\frac{1}{Assets_{it-1}}\right) + \beta_5 \left(\frac{Sales_{it-1}}{Assets_{it-1}}\right) + \beta_x Controls + \gamma_x INTERACTIONS + \varepsilon_{it}$ |
| (9) | $ASSETSALES = \beta_0 + \beta_1 DIV_{it-1} + \beta_2 COVRISK_{it} + \beta_3 COVRISK_{it} * DIV_{it-1} + \beta_4 \left(\frac{1}{Assets_{it-1}}\right) + \beta_5 \left(\frac{Sales_{it-1}}{Assets_{it-1}}\right) + \beta_x Controls + \gamma_x INTERACTIONS + \varepsilon_{it}$ |

## 4.5 Data and sample

For this thesis, the financial statement data is collected from the Compustat North America database. The data for CEO compensation is gathered from the ExecuComp database. Furthermore, data to analyze analyst following is derived from the I/B/E/S Summary database and data to calculate institutional ownership is gathered from the Thomson Reuters 13f file.

The initial sample period consists of firm-year observations with fiscal year ends between 2000 and 2019. This time period is chosen since the hypothesis development is mainly derived from the survey research of Brav et al. (2005) which focuses on firms in the 21st century. The sample procedure starts by taking all the Compustat variables needed for the analysis. In line with prior literature, firms in regulated industries with SIC codes 4900-4949 are excluded as well as firms in the financial service industry containing SIC codes 6000-6999 (Liu and Espahbodi, 2014). This being done because these firm experience different institutional and regulatory constraints (Roychowdhury, 2006; Daniel et al., 2008; Tong and Miao, 2011). Furthermore, this research solely focuses on publicly listed firms in the US because my hypotheses are mainly derived from the study of Brav et al. (2005) who also focus on publicly listed US firms. So, private firms are excluded from the sample. Moreover, firms with zero assets and zero revenue are excluded from the sample because these firms are considered non-operative. Then, the Execucomp, I/B/E/S Summary and Thomson Reuters datasets are merged into the existing dataset by the firm identifier and firm-year. This results in an initial sample of 80.163 firm-years. Finally, rows containing missing values and duplicate rows are reduced from the sample which results in a final sample of 12.144 firm-years (Table 4). For the testing of hypothesis 1 and 2, the final sample includes firm-years containing zero total debt. For the testing of hypothesis 3, firms without debt are excluded since the effect of debt covenants is analyzed. This results in a final sample for hypothesis 3 of 9.912 observations.

**Table 4: Sample selection procedure**

| Description | Observations |
|---|---|
| Observations drawn from Compustat North America for the period 2000-2019. | **249.169** |
| Less: Firms not publicly listed. | (92.593) |
| Less: Firms in regulated and financial services industries. | (74.489) |
| Less: Firm-years containing zero total assets and zero total revenue. | (6.831) |
| Merge the data with Execucomp, I/B/E/S Summary and Thomson Reuters data. | 4.907 |
| **Initial sample** | **80.163** |
| Less: Missing values for variables needed for the regression models. | (67.979) |
| Less: Duplicate rows | (40) |
| **Final sample (H1 and H2)** | **12.144** |
| Less: firms without debt | (2.232) |
| **Final sample (H3)** | **9.912** |

# 5. Empirical results

In this chapter, the results of the three hypotheses will be discussed. For a proper understanding of the results, I first analyze the descriptive statistics of the variables of interest. Next, the correlation among the variables of interest and dependent variables will be discussed. Thereafter, the regression results of the three hypotheses are being presented. Finally, the additional tests which replace the variable of interest $DIV_{t-1}$ by PDIV will be presented.

## 5.1 Descriptive statistics

Table 5 and 6 provide descriptive statistics of all the variables used in the regression models for the full sample and for the samples containing only (non-) dividend paying firms respectively. To control for outliers, the continuous variables are winsorized at the 1st and 99th percentile[6]. The variable ADISX, ANALYST and the variables which are being derived using the natural logarithm (SIZE, AGE) are not winsorized, since these variables initially do not contain extreme outliers.

The descriptive statistics of the full sample (Table 5) reveal that 45 percent of the firms paid a dividend in the prior year and that 36 percent of the firms can be marked as a persistent dividend payer. Also, it can be found that around 21 percent of the firms have an interest coverage ratio equal or below two which indicates a covenant risk (COVRISK). Furthermore, the mean of the abnormal discretionary expenses is zero. This is in line with the idea that on average, the discretionary expenses can be explained by regular business activity.

To better compare the differences between dividend-paying firms and non-payers, the sample has been split up and descriptive statistics are given for each subsample (Table 6). Interestingly, it becomes observable that the mean abnormal discretionary expenses (ADISX) for dividend-paying firms is 0,07 less than for non-payers. Also, dividend payers have, on average, less discretionary expenses (DISX) and larger asset sales (ASSETSALES). Additionally, it can be observed that 79% of the dividend paying is classified as a persistent dividend (e.g. five consecutive years of paying). Furthermore, the pre-managed earnings change variables are normally distributed. Finally, 12 percent of the dividend payers is marked with a high covenant risk compared to 28 per cent of the non-payers. This could be an indication that dividend paying firms are managing more closely their interest coverage ratios.

The variables included regarding management compensation show that managers receive on average a smaller bonus ($BONUS_{t-1}$) in dividend paying firms while the mean stock incentive ratio (STOCK) remains the same between payers and non-payers. The variables included to control for characteristics of dividend payers show that payers are on average larger than non-payers (SIZE). Also, dividend payers are more profitable since the ROA and the LOSS variable are on average higher and lower than for non-payers, respectively. The final characteristic of dividend payers is the lower BTM-ratio. The mean BTM-value of dividend payers is 0,06 lower than for non-payers and is therefore in line with the expectations guided by Fama and French (2001). The variables included to control for firm maturity show that dividend payers are on average older (AGE) and have lower growth rates (GROWTH). This is in line with the expectations guided by prior research of DeAngelo et al. (2006). The variables which should capture the ability to pay dividends show that dividend payers have on average higher retained earnings (RE) and higher cash flows from operations (CFO). The capital market variables show that dividend payers are on average followed by more analysts (ANALYSTS). Unexpectedly, the percentage of institutional ownership (INST) of dividend payers is slightly less than for non-payers. Also, the 75th percentile amounts 0.94. This seems very high, however in the US, almost 80% of the equity market cap is held by institutions (Pensions and Investments, 2017). Also, the maximum value of institutional

[6] Regression results without winsorization are presented in table 18, 19 and 20 in the appendix.

ownership is greater than 1, which is odd since institutional investors seem to have more shares than they could actually own. This phenomenon could be explained by a large short-float of a firm[7]. In untabulated results, it is confirmed that in the initial sample of 80.163 firm-year observation the average institutional ownership amounts 53% and the 75$^{th}$ percentile amounts 83%. So, it is concluded no errors are present in the data and that the high amount of institutional ownership is explained by the deletion of missing values. In sum, all the variables are normally distributed and no further corrections need to be made.

The same descriptive statistics table comparing persistent payers with non-persistent payers is given in the appendix (Table 15). In table 15 can be observed that of the non-persistent dividend payers, only 15% paid an actual dividend. Again, the (abnormal) discretionary expenses are lower for persistent dividend payers compared to non-persistent payers. Also, the asset sales are lower for the persistent payers. Additionally, it can be observed that the covenant risk is again lower for persistent payers compared to non-persistent payers. Furthermore, the variable distributions of the control variables show no strange patterns.

**Table 5: Descriptive statistics – Full sample**

| Variable | Mean | Std. Dev. | Min | 25th Perc. | 75th Perc. | Max |
|---|---|---|---|---|---|---|
| ADISX | 0,00 | 0,22 | -1,87 | -0,11 | 0,07 | 3,60 |
| DISX | 0,34 | 0,28 | 0,00 | 0,14 | 0,47 | 1,49 |
| ASSETSALES | 0,05 | 0,14 | 0,00 | 0,00 | 0,01 | 0,82 |
| $DIV_{t-1}$ | 0,45 | 0,50 | 0,00 | 0,00 | 1,00 | 1,00 |
| PDIV | 0,36 | 0,48 | 0,00 | 0,00 | 1,00 | 1,00 |
| PMEC_ADISX | 0,01 | 0,23 | -0,50 | -0,12 | 0,09 | 0,95 |
| PMEC_DISX | 0,35 | 0,30 | -0,12 | 0,14 | 0,48 | 1,65 |
| PMEC_ASSETSALES | -0,05 | 0,17 | -0,86 | -0,06 | 0,02 | 0,37 |
| COVRISK | 0,21 | 0,40 | 0,00 | 0,00 | 0,00 | 1,00 |
| LOSS | 0,18 | 0,38 | 0,00 | 0,00 | 0,00 | 1,00 |
| SIZE | 7,46 | 1,65 | 1,46 | 6,32 | 8,43 | 13,61 |
| BTM | 0,46 | 0,37 | -0,29 | 0,22 | 0,61 | 2,00 |
| GROWTH | 0,09 | 0,21 | -0,43 | 0,00 | 0,15 | 1,17 |
| ROA | 0,05 | 0,11 | -0,46 | 0,02 | 0,10 | 0,31 |
| RE | 0,10 | 0,87 | -5,04 | 0,01 | 0,49 | 1,36 |
| CFO | 0,12 | 0,10 | -0,26 | 0,07 | 0,17 | 0,41 |
| AGE | 3,10 | 0,69 | 0,69 | 2,71 | 3,61 | 4,25 |
| LEV | 0,21 | 0,19 | 0,00 | 0,01 | 0,33 | 0,81 |
| $BONUS_{t-1}$ | 0,15 | 0,46 | 0,00 | 0,00 | 0,00 | 2,99 |
| STOCK | 0,25 | 0,24 | 0,00 | 0,07 | 0,35 | 1,00 |
| ANALYST | 10,55 | 7,98 | 1,00 | 4,00 | 15,00 | 55,00 |
| INST | 0,79 | 0,23 | 0,01 | 0,69 | 0,93 | 1,20 |

**Notes:** The sample consists of 12.144 observations. Continuous variables are winsorized at the top and bottom 1% level. The variable definitions are given in table 14 in the appendix.

[7] For example, if institution X owns 100% of the shares in company A and institution Y 'borrows' 20% of the shares and sells them to institution Z (short-sell). Then institution X and Z own together 120% of the shares.

**Table 6: Descriptive statistics – Payers vs. Non Payers**

| | *Dividend payers (N=5.508)* | | | | | | *Non-dividend payers (N=6.636)* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Mean | Std. Dev. | Min | 25th Perc. | 75th Perc. | Max | Mean | Std. Dev. | Min | 25th Perc. | 75th Perc. | Max |
| ADISX | -0,04 | 0,18 | -1,08 | -0,13 | 0,04 | 3,60 | 0,03 | 0,25 | -1,87 | -0,10 | 0,11 | 2,74 |
| DISX | 0,29 | 0,23 | 0,00 | 0,12 | 0,40 | 1,49 | 0,39 | 0,30 | 0,00 | 0,17 | 0,52 | 1,49 |
| ASSETSALES | 0,04 | 0,11 | 0,00 | 0,00 | 0,01 | 0,82 | 0,07 | 0,16 | 0,00 | 0,00 | 0,02 | 0,82 |
| $DIV_{t-1}$ | 1,00 | 0,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| PDIV | 0,79 | 0,41 | 0,00 | 1,00 | 1,00 | 1,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| PMEC_ADISX | -0,03 | 0,18 | -0,50 | -0,13 | 0,05 | 0,95 | 0,04 | 0,26 | -0,50 | -0,11 | 0,14 | 0,95 |
| PMEC_DISX | 0,29 | 0,24 | -0,12 | 0,12 | 0,42 | 1,65 | 0,40 | 0,34 | -0,12 | 0,16 | 0,54 | 1,65 |
| PMEC_ASSETSALES | -0,03 | 0,13 | -0,86 | -0,04 | 0,01 | 0,37 | -0,06 | 0,20 | -0,86 | -0,09 | 0,02 | 0,37 |
| COVRISK | 0,12 | 0,32 | 0,00 | 0,00 | 0,00 | 1,00 | 0,28 | 0,45 | 0,00 | 0,00 | 1,00 | 1,00 |
| LOSS | 0,09 | 0,29 | 0,00 | 0,00 | 0,00 | 1,00 | 0,25 | 0,43 | 0,00 | 0,00 | 0,00 | 1,00 |
| SIZE | 8,02 | 1,62 | 2,78 | 6,82 | 9,06 | 13,57 | 7,00 | 1,51 | 1,46 | 5,97 | 7,85 | 13,61 |
| BTM | 0,42 | 0,33 | -0,29 | 0,21 | 0,56 | 2,00 | 0,49 | 0,40 | -0,29 | 0,22 | 0,67 | 2,00 |
| GROWTH | 0,05 | 0,16 | -0,43 | -0,01 | 0,11 | 1,17 | 0,12 | 0,25 | -0,43 | 0,00 | 0,20 | 1,17 |
| ROA | 0,07 | 0,08 | -0,46 | 0,04 | 0,11 | 0,31 | 0,03 | 0,12 | -0,46 | 0,00 | 0,09 | 0,31 |
| RE | 0,37 | 0,40 | -5,04 | 0,18 | 0,57 | 1,36 | -0,13 | 1,07 | -5,04 | -0,20 | 0,40 | 1,36 |
| CFO | 0,13 | 0,08 | -0,26 | 0,08 | 0,17 | 0,41 | 0,11 | 0,11 | -0,26 | 0,05 | 0,17 | 0,41 |
| AGE | 3,40 | 0,63 | 0,69 | 3,04 | 3,93 | 4,25 | 2,85 | 0,63 | 0,69 | 2,48 | 3,26 | 4,25 |
| LEV | 0,23 | 0,18 | 0,00 | 0,09 | 0,34 | 0,81 | 0,19 | 0,20 | 0,00 | 0,00 | 0,32 | 0,81 |
| $BONUS_{t-1}$ | 0,11 | 0,38 | 0,00 | 0,00 | 0,00 | 2,99 | 0,18 | 0,52 | 0,00 | 0,00 | 0,00 | 2,99 |
| STOCK | 0,25 | 0,23 | 0,00 | 0,08 | 0,35 | 1,00 | 0,25 | 0,25 | 0,00 | 0,06 | 0,35 | 1,00 |
| ANALYST | 11,54 | 8,21 | 1,00 | 5,00 | 17,00 | 54,00 | 9,72 | 7,68 | 1,00 | 4,00 | 13,00 | 55,00 |
| INST | 0,76 | 0,22 | 0,01 | 0,68 | 0,91 | 1,20 | 0,80 | 0,24 | 0,01 | 0,71 | 0,95 | 1,20 |

**Notes:** The sample consists of a total of 12.144 observations of which 5.508 are dividend payers. Continuous variables are winsorized at the top and bottom 1% level. The variable definitions are given in table 14 in the appendix.

## 5.2 Correlation analysis

Table 7 presents the correlation matrix of the variables used in this research. As can be observed, dividend paying firms ($DIV_{t-1}$) are significantly negatively correlated with both abnormal discretionary expenses (ADISX) and discretionary expenses (DISX). Also, dividend paying firms are significantly negatively correlated with the scaled amount of asset sales (ASSETSALES). Moreover, the correlation coefficients between persistent dividend payers (PDIV) and the real earnings management proxies seem to be in the same direction but the magnitude of the relationship is weaker.

Furthermore, some other correlation coefficients stand out. The pre-managed earnings change variable (PMEC#) for each specific model is strongly and significantly correlated with the corresponding earnings management proxy[8]. This is expected since companies with a strong positive pre-managed earnings change will engage in more earnings smoothing. More specifically, if the pre-managed earnings change increases, it is expected that the amount of (abnormal) discretionary expenses increase and the asset sales decrease.

Finally, the correlation coefficient of the covenant risk indicator variable is significantly positive for (abnormal) discretionary expenses, suggesting that firms which have a higher risk of violating a debt covenant have more abnormal discretionary expenses. This is against the expectation that a higher covenant risk would decrease abnormal discretionary due to cost cutting of management (e.g. real earnings management). Also, for the asset sales variable, the correlation coefficient is positive suggesting that a higher covenant risk is related to an increase in asset sales.

The correlation coefficients presented in table 7 provide an initial indication of the association between dividend payers and discretionary expenses or asset sales. The actual association will be analyzed with the regression models.

[8] The variable PMEC# is specified per model and is denoted in the table as PMEC_ADISX, PMEC_DISX and PMEC_ASSETSALES for each earnings management proxy respectively.

**Table 7: Pearson Correlation Matrix**

| | Variable | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | ADISX | | | | | | | | | | | | | | | | | | | | | | |
| (2) | DISX | 0,69*** | | | | | | | | | | | | | | | | | | | | | |
| (3) | ASSETSALES | 0,09*** | 0,06*** | | | | | | | | | | | | | | | | | | | | |
| (4) | $DIV_{t-1}$ | -0,15*** | -0,18*** | -0,11*** | | | | | | | | | | | | | | | | | | | |
| (5) | PDIV | -0,12*** | -0,16*** | -0,11*** | 0,82*** | | | | | | | | | | | | | | | | | | |
| (6) | PMEC_ADISX | 0,87*** | 0,67*** | 0,10*** | -0,16*** | -0,12*** | | | | | | | | | | | | | | | | | |
| (7) | PMEC_DISX | 0,66*** | 0,94*** | 0,06*** | -0,18*** | -0,15*** | 0,77*** | | | | | | | | | | | | | | | | |
| (8) | PMEC_ASSETSALES | -0,06*** | -0,02** | -0,82*** | 0,07*** | 0,09*** | 0,17*** | 0,15*** | | | | | | | | | | | | | | | |
| (9) | COVRISK | 0,15*** | 0,23*** | 0,19*** | -0,20*** | -0,19*** | 0,12*** | 0,20*** | -0,19*** | | | | | | | | | | | | | | |
| (10) | LOSS | 0,12*** | 0,10*** | 0,04*** | -0,20*** | -0,18*** | 0,00 | 0,02* | -0,18*** | 0,36*** | | | | | | | | | | | | | |
| (11) | SIZE | -0,10*** | -0,40*** | -0,01 | 0,31*** | 0,32*** | -0,11*** | -0,38*** | 0,00 | -0,36*** | -0,22*** | | | | | | | | | | | | |
| (12) | BTM | -0,17*** | -0,22*** | -0,06*** | -0,09*** | -0,09*** | -0,21*** | -0,24*** | -0,02* | 0,03*** | 0,24*** | -0,07*** | | | | | | | | | | | |
| (13) | GROWTH | 0,20*** | 0,16*** | 0,08*** | -0,16*** | -0,15*** | 0,30*** | 0,24*** | 0,09*** | 0,00 | -0,12*** | -0,09*** | -0,15*** | | | | | | | | | | |
| (14) | ROA | -0,09*** | -0,03*** | -0,01 | 0,19*** | 0,16*** | 0,10*** | 0,10*** | 0,25*** | -0,29*** | -0,70*** | 0,17*** | -0,28*** | 0,15*** | | | | | | | | | |
| (15) | RE | -0,21*** | -0,26*** | -0,09*** | 0,28*** | 0,27*** | -0,22*** | -0,26*** | 0,06*** | -0,28*** | -0,39*** | 0,29*** | 0,09*** | -0,12*** | 0,47*** | | | | | | | | |
| (16) | CFO | 0,05*** | 0,10*** | 0,02** | 0,11*** | 0,08*** | 0,13*** | 0,15*** | 0,10*** | -0,16*** | -0,42*** | 0,09*** | -0,30*** | 0,14*** | 0,67*** | 0,35*** | | | | | | | |
| (17) | AGE | -0,14*** | -0,21*** | -0,07*** | 0,40*** | 0,47*** | -0,13*** | -0,20*** | 0,06*** | -0,18*** | -0,11*** | 0,37*** | 0,00 | -0,22*** | 0,09*** | 0,20*** | -0,05*** | | | | | | |
| (18) | LEV | -0,08*** | -0,28*** | -0,12*** | 0,10*** | 0,08*** | -0,10*** | -0,27*** | 0,07*** | -0,23*** | 0,07*** | 0,35*** | -0,12*** | -0,04*** | -0,13*** | -0,12*** | -0,11*** | 0,08*** | | | | | |
| (19) | $BONUS_{t-1}$ | 0,01 | 0,10*** | 0,03*** | -0,08*** | -0,10*** | 0,01 | 0,09*** | -0,02*** | 0,11*** | 0,03*** | -0,23*** | -0,02** | 0,11 | -0,01*** | -0,10 | -0,01*** | -0,12*** | -0,08*** | | | | |
| (20) | STOCK | 0,09*** | 0,06*** | 0,07*** | 0,00 | -0,01 | 0,09*** | 0,06*** | -0,04*** | -0,01 | -0,16*** | 0,16*** | -0,23*** | 0,12*** | 0,17*** | 0,13*** | 0,18*** | -0,07*** | -0,10*** | -0,04*** | | | |
| (21) | ANALYST | 0,09*** | -0,05*** | 0,15*** | 0,11*** | 0,12*** | 0,09*** | -0,05*** | -0,12*** | -0,12*** | -0,17*** | 0,63*** | -0,27*** | 0,03*** | 0,18*** | 0,15*** | 0,24*** | 0,07*** | 0,09*** | -0,16*** | 0,25*** | | |
| (22) | INST | 0,03*** | -0,05*** | 0,01 | -0,08*** | -0,08*** | 0,02* | -0,05*** | -0,01 | -0,09*** | -0,10*** | 0,03*** | -0,03*** | 0,04*** | 0,12*** | 0,16*** | 0,11*** | -0,09 | -0,01*** | -0,05*** | -0,08*** | 0,11*** | |

**Notes:** The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively (two-tailed). The sample consists of 12.144 observations. Continuous variables are winsorized at the top and bottom 1% level. The variable definitions are given in table 14 in the appendix.

## 5.3 Regression results

This section reports the testing of the three hypotheses using the variable of interest dividend paying firms ($DIV_{t-1}$). The results of the regression models in table 1, 2 and 3 are presented in table 8, 9 and 10 respectively.

The results for the models testing the first hypothesis are presented in table 8. The model using abnormal discretionary expenses as a proxy for real earnings management has an adjusted R-squared value of 17,71%. This indicates that 17.71% of the variance in the abnormal discretionary expenses variable is explained by the independent variables and control variables. For the discretionary expenses and asset sales variable, the R-squared amounts 60,09% and 15,96% respectively. Also ,the F-statistic of model 1, 2 and 3 are significant at the 1% level. This indicates that it is very unlikely that all the coefficients in the model are equal to zero and thus the model itself is significant. When examining the variable of interest ($DIV_{t-1}$), the coefficients for both the abnormal discretionary expenses as well as the discretionary expenses are significantly negative (-0.03 and -0.03 respectively) at a 1% level. The coefficient for the asset sales model is significantly negative (-0.01) at the 10% level.

The results suggest that dividend paying firms have on average 0.03 less abnormal discretionary expenses than non-paying firms. In economic terms, this means that the ratio of abnormal discretionary expenses as a fraction of total assets is 3% less for dividend paying firms. Compared to the descriptive statistics of the full sample, the difference between the $25^{th}$ percentile and $75^{th}$ percentile of abnormal discretionary expenses is 0.18. It can therefore be concluded that the difference of 0.03 between dividend payers and non-payers is economically significant. Furthermore, the results suggest that, on a 10% significant level, dividend paying firms have 0.01 less asset sales (as a fraction of total assets) compared to non-payers. This result is in line with the hypothesis that dividend payers have better earnings quality and engage in less real earnings management than non-payers.

In sum, the results of the asset sales model suggests that (in line with the aforementioned hypothesis) dividend paying firms engage in less upward earnings management than non-payers. However, the results of the discretionary expenses models suggest that dividend paying firms engage more in upward real earnings management than firms which do not pay a dividend. This goes against the hypothesis that dividend paying firms have better earnings quality than firms which do not pay a dividend. Since the significance level of the coefficient in the asset sales model can only be accepted at a 10% level and the discretionary expenses models at a 1% level, the discretionary expenses models are taken as more reliable. Thus, hypothesis one is rejected: dividend paying firms engage on average in more upward real earnings management.

**Table 8: Regression results for hypothesis 1 – $DIV_{t-1}$**

| *Independent variables* | *Real earnings management proxy* | | | | | |
|---|---|---|---|---|---|---|
| | ADISX (1) | | DISX (2) | | ASSETSALES (3) | |
| | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Constant | 0.40** | *(0.05)* | 0.56*** | *(0.00)* | 0.04 | *(0.79)* |
| **$DIV_{t-1}$** | **-0.03*** ** | ***(0.00)*** | **-0.03*** ** | ***(0.00)*** | **-0.01*** | ***(0.08)*** |
| SCALED_INTERCEPT | | | -71.58** | *(0.04)* | -13.71 | *(0.58)* |
| SALES_ASSETS_LAG | | | 0.16*** | *(0.00)* | 0.02 | *(0.51)* |
| LOSS | 0.05*** | *(0.00)* | 0.05*** | *(0.00)* | 0.02*** | *(0.00)* |
| SIZE | -0.02*** | *(0.00)* | -0.04*** | *(0.00)* | -0.01*** | *(0.00)* |
| BTM | -0.10*** | *(0.00)* | -0.10*** | *(0.00)* | -0.01*** | *(0.00)* |
| GROWTH | 0.17*** | *(0.00)* | 0.16*** | *(0.00)* | -0.01* | *(0.08)* |
| ROA | -0.35*** | *(0.00)* | -0.31*** | *(0.00)* | 0.08*** | *(0.00)* |
| RE | -0.04*** | *(0.00)* | -0.05*** | *(0.00)* | -0.01*** | *(0.00)* |
| CFO | 0.35*** | *(0.00)* | 0.32*** | *(0.00)* | 0.04** | *(0.04)* |
| AGE | -0.01 | *(0.12)* | -0.00 | *(0.52)* | -0.00 | *(0.36)* |
| LEV | -0.16*** | *(0.00)* | -0.19*** | *(0.00)* | -0.08*** | *(0.00)* |
| $BONUS_{t-1}$ | -0.02*** | *(0.00)* | -0.01* | *(0.07)* | 0.00 | *(0.39)* |
| STOCK | 0.03*** | *(0.00)* | 0.03*** | *(0.00)* | 0.01 | *(0.11)* |
| ANALYST | 0.01*** | *(0.00)* | 0.01*** | *(0.00)* | 0.00*** | *(0.00)* |
| INST | 0.05*** | *(0.00)* | 0.01 | *(0.15)* | -0.01** | *(0.03)* |
| Observations | 12144 | | 12144 | | 12144 | |
| Adjusted $R^2$ | 17.71% | | 60.09% | | 15.96% | |
| F-statistic | 31.04*** | | 79.82*** | | 10.94*** | |
| Industry-year interactions | No | | Yes | | Yes | |
| Industry Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

**Notes**: The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The values between the brackets represent the p-values for each coefficient. Continuous variables are winsorized at the top and bottom 1% level. For the DISX and ASSETSALES model, industry-year interactions are added to the model in accordance with Chen et al. (2018). The variable definitions are given in table 14 in the appendix.

The results for the second hypothesis are reported in table 9. The variance of the dependent variables ADISX, DISX and ASSETSALES, which is explained by the model, amounts to 77,11%, 90,47% and 72,52% respectively. Also ,the F-statistic of model 4, 5 and 6 are significant at the 1% level. This indicates that it is very unlikely that all the coefficients in the model are equal to zero and thus the model itself is significant.

The coefficient of the variable pre-managed earnings change (PMEC#) is significantly positive for the discretionary expenses models and significantly negative for the asset sales model (at a 1% level). The coefficient of the abnormal discretionary expenses and discretionary expenses models are 0.84 and 0.77 respectively. This indicates that when a firms pre-managed earnings change increases with 1%, firms incur on average 0.84% and 0.77% more discretionary expenses as a fraction of total assets. Also, firms sell significantly less of their assets when their pre-managed earnings change increases. For a 1% increase in pre-managed earnings change, a firm sells on average 0.65% less of their assets. Thus, for the whole sample, it is found that firms engage in earnings smoothing.

The coefficient of the indicator variable for dividend paying firms ($DIV_{t-1}$) becomes insignificant for the abnormal discretionary expenses model. For the one-stage models using discretionary expenses and asset sales as dependent variable, the coefficients are both significant at a 1% level and comparable to the coefficients for the tests of hypothesis 1. This indicates again, that dividend paying firms engage in upward (downward) real earnings management using discretionary expenses (asset sales) as proxy for real earnings management.

More importantly, the regression coefficient of the interaction term between the pre-managed earnings change variable and the dividend paying firm dummy is significantly positive for both abnormal discretionary expenses as well as for discretionary expenses (0.10 and 0.07 at a 1% level respectively). This indicates that if the pre-managed earnings change increases with 0.01 (1%), dividend-paying firms incur 0.0010 (0.10%) more abnormal discretionary expenses as a fraction of total assets than non-dividend paying firms. For the discretionary expenses model, dividend paying firms have in general 0.03 less discretionary expenses, but for every per cent increase in the pre-managed earnings change, 0.07 more discretionary expenses are incurred. Moreover, the coefficient of the interaction term for the asset sales model is significantly negative (-0.09 at a 1% level), indicating that if the pre-managed earnings change increases with 0.01, dividend paying firms sell 0.0009 (e.g. 0.09%) less of their assets (as a fraction of total assets) than firms which do not pay a dividend. These findings are consistent with hypothesis 2, stating that if the pre-managed earnings change increases (decreases), dividend paying firms engage in more downward (upward) real earnings management than firms which do not pay a dividend. The interaction effect is visualized in figure 4, 5 and 6 in the appendix.

The individual t-tests of the regression coefficients indicate significance at a 1% level. Nevertheless, to assure the interaction term is interpretable, an analysis of variance is performed to assess whether the variables of interest, $DIV_{t-1}$, PMEC# and their interaction term are jointly significant. In table 16 in the appendix, the F-values for hypothesis 2 are presented in panel B. The F-values are significant and thus the F-test rejects the null-hypothesis that at least one of the coefficients of the variables of interest equals zero. In other words, it can be concluded that the effect of having a pre-managed earnings change is different for dividend payers compared to non-dividend payers. In conclusion, hypothesis 2 stating that dividend paying firms engage in more earnings smoothing than firms which do not pay a dividend is accepted.

**Table 9: Regression results for hypothesis 2 – $DIV_{t-1}$**

| *Independent variables* | *Real earnings management proxy* | | | | | |
|---|---|---|---|---|---|---|
| | ADISX (4) | | DISX (5) | | ASSETSALES (6) | |
| | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Constant | 0,13*** | *(0.00)* | 0.17* | *(0.00)* | -0.02 | *(0.77)* |
| $DIV_{t-1}$ | 0.01 | *(0.12)* | -0.03*** | *(0.00)* | -0.01*** | *(0.00)* |
| PMEC# | 0.84*** | *(0.00)* | 0.77*** | *(0.00)* | -0.65*** | *(0.00)* |
| **$DIV_{t-1}$*PMEC#** | **0.10*** ** | ***(0.00)*** | **0.07*** ** | ***(0.00)*** | **-0.09*** ** | ***(0.00)*** |
| SCALED_INTERCEPT | | | -33.72** | *(0.04)* | 14.74 | *(0.29)* |
| SALES_ASSETS_LAG | | | -0.02 | *(0.38)* | 0.01 | *(0.43)* |
| SIZE | -0.00*** | *(0.00)* | -0.01*** | *(0.00)* | -0.00 | *(0.18)* |
| BTM | -0.00 | *(0.25)* | -0.01*** | *(0.00)* | -0.01*** | *(0.00)* |
| GROWTH | -0.06*** | *(0.00)* | -0.06*** | *(0.00)* | 0.08*** | *(0.00)* |
| RE | -0.00 | *(0.22)* | -0.00* | *(0.06)* | -0.01*** | *(0.00)* |
| CFO | -0.18*** | *(0.00)* | -0.16*** | *(0.00)* | 0.16*** | *(0.00)* |
| AGE | -0.01*** | *(0.00)* | -0.01*** | *(0.00)* | 0.01*** | *(0.00)* |
| LEV | -0.01 | *(0.25)* | -0.02*** | *(0.00)* | -0.04*** | *(0.00)* |
| $BONUS_{t-1}$ | -0.00 | *(0.90)* | 0.00 | *(0.40)* | -0.00* | *(0.09)* |
| STOCK | 0.02*** | *(0.00)* | 0.02*** | *(0.00)* | -0.01 | *(0.14)* |
| ANALYST | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* |
| INST | 0.02*** | *(0.00)* | 0.01** | *(0.05)* | -0.01** | *(0.05)* |
| Observations | 12144 | | 12144 | | 12144 | |
| Adjusted $R^2$ | 77.30% | | 90.98% | | 72.95% | |
| F-statistic | 473.2*** | | 529.1*** | | 142.2*** | |
| Industry-year interactions | No | | Yes | | Yes | |
| Industry Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

**Notes**: The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The '#' indicates that the PMEC variable is specific for either ADISX, DISX or ASSETSALES. The values between the brackets represent the p-values for each coefficient. Continuous variables are winsorized at the top and bottom 1% level. For the DISX and ASSETSALES model, industry-year interactions are added to the model in accordance with Chen et al. (2018). The variable definitions are given in table 14 in the appendix.

The regression results for the third hypothesis are reported in table 10. The adjusted R-squared for the ADISX, DISX and ASSETSALES models are 13.09%, 60.38% and 8.82% respectively. Also ,the F-statistic of model 7, 8 and 9 are significant at the 1% level. This indicates that it is very unlikely that all the coefficients in the model are equal to zero and thus the model itself is significant. Important to note is that the sample size for these tests amount 9912 compared to 12144 of the previous tests. That is because for this hypothesis, only firms with total debt above zero are analyzed.

First, the indicator variable for dividend paying firms is significantly negative for both discretionary expenses models at a 1% level (-0.02 and -0.02 respectively). The coefficient for the assets sales model (0.01) is significantly positive at the 5% level. This indicates that in general, dividend payers incur 0.02 less discretionary expenses and sell 0.01 more of their assets (both as a portion of total assets). Furthermore, the COVRISK variable is significantly positive at the 1% level for each model (0.06, 0.07 and 0.05 respectively). This indicates that having an interest coverage ratio equal or below 2 results on average on more (abnormal) discretionary expenses and more asset sales.

In line with the expectations, the regression coefficients of the interaction terms between dividend paying firms ($DIV_{t-1}$) and covenant risk (COVRISK) is significantly negative at a 1% level for model 7 and 8. The coefficients equal -0.08 and -0.09 respectively and indicate that for dividend paying firms with an interest coverage ratio equal or below 2, the abnormal discretionary expenses are on average 0.08 and 0.09 lower than for firms which do not pay a dividend. On the contrary, the coefficient of the interaction term is significantly negative at a 10% level for model 9. The coefficient (-0.02) indicates that dividend paying firms with an interest coverage ratio equal or below 2, on average 0.02 less asset sales (as a portion of total assets) than firms which do not pay a dividend. This is against the hypothesis that dividend paying firms try to circumvent debt covenants more through the sale of assets. See figure 7, 8 and 9 in the appendix for a visualization of the interaction effect.

The individual t-tests of the regression coefficients indicate significance at a 1% level for model 7 and 8 and at the 10% level for model 9. Nevertheless, to assure the interaction term is interpretable, an analysis of variance is performed to assess whether the variables of interest, $DIV_{t-1}$, COVRISK and their interaction term are jointly significant. In table 16 in the appendix, the F-values for hypothesis 3 are presented in panel C. The F-values are significant and thus the F-test rejects the null-hypothesis that at least one of the coefficients of the variables of interest equals zero. In other words, it can be concluded that the effect of having a covenant risk is different for dividend payers compared to non-dividend payers.

In sum, the findings are mixed. The results suggest that dividend paying firms which face more risk of violating a debt covenant, engage in more cost cutting behavior than their non-paying counterparts. However, regarding the asset sales, dividend paying firms which face more risk of violating a debt covenant, sell less of their assets than their non-dividend paying firms. Since this coefficient is only significant at the 10% level, this research is cautious with its interpretation. More weight is therefore put on the highly significant coefficients of the discretionary expenses models. In conclusion, hypothesis 3, which states that dividend paying firms engage in more downward real earnings management than firms which do not pay a dividend to circumvent debt covenants, is accepted.

**Table 10: Regression results for hypothesis 3 – $DIV_{t-1}$**

| *Independent variables* | *Real earnings management proxy* | | | | | |
|---|---|---|---|---|---|---|
| | ADISX (7) | | DISX (8) | | ASSETSALES (9) | |
| | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Constant | 0.43** | *(0.03)* | 0.43*** | *(0.00)* | 0.00 | *(0.98)* |
| $DIV_{t-1}$ | -0.02*** | *(0.00)* | -0.02*** | *(0.00)* | 0.01** | *(0.04)* |
| COVRISK | 0.06*** | *(0.00)* | 0.07*** | *(0.00)* | 0.05*** | *(0.02)* |
| **$DIV_{t-1}$*COVRISK** | **-0.08*** ** | ***(0.00)*** | **-0.09*** ** | ***(0.04)*** | **-0.02*** | ***(0.09)*** |
| SCALED_INTERCEPT | | | -56.94 | *(0.27)* | 11.40 | *(0.78)* |
| SALES_ASSETS_LAG | | | 0.16** | *(0.02)* | -0.00 | *(0.99)* |
| LOSS | 0.02** | *(0.03)* | 0.01* | *(0.10)* | 0.00 | *(0.53)* |
| SIZE | -0.03*** | *(0.00)* | -0.04*** | *(0.00)* | -0.01*** | *(0.00)* |
| BTM | -0.00 | *(0.48)* | -0.00 | *(0.48)* | -0.00*** | *(0.00)* |
| GROWTH | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* | -0.00* | *(0.10)* |
| ROA | -0.13*** | *(0.00)* | -0.16*** | *(0.00)* | 0.03 | *(0.21)* |
| RE | -0.02*** | *(0.00)* | -0.03*** | *(0.00)* | -0.00** | *(0.05)* |
| CFO | -0.12*** | *(0.00)* | 0.21*** | *(0.00)* | 0.09*** | *(0.00)* |
| AGE | -0.00 | *(0.25)* | -0.00 | *(0.28)* | -0.00 | *(0.39)* |
| $BONUS_{t-1}$ | 0.01*** | *(0.01)* | -0.00 | *(0.16)* | -0.00 | *(0.68)* |
| STOCK | 0.08*** | *(0.00)* | 0.08*** | *(0.00)* | 0.01** | *(0.05)* |
| ANALYST | 0.01*** | *(0.00)* | 0.01*** | *(0.00)* | 0.00*** | *(0.00)* |
| INST | 0.01** | *(0.02)* | 0.01** | *(0.03)* | -0.00 | *(0.68)* |
| Observations | 9912 | | 9912 | | 9912 | |
| Adjusted $R^2$ | 13.09% | | 60.38% | | 8.82% | |
| F-statistic | 17.96*** | | 65.83*** | | 5.12*** | |
| Industry-year interactions | No | | Yes | | Yes | |
| Industry Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

**Notes**: The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The values between the brackets represent the p-values for each coefficient. Continuous variables are winsorized at the top and bottom 1% level. For the DISX and ASSETSALES model, industry-year interactions are added to the model in accordance with Chen et al. (2018). The variable definitions are given in table 14 in the appendix.

## 5.4 Additional tests

This section reports the testing of the three hypotheses using the variable of interest Persistent Dividend Payer (PDIV) instead of firms who paid a dividend in the prior year ($DIV_{t-1}$). The results of the regression models in table 1, 2 and 3 are presented in table 11, 12 and 13 respectively. The adjusted R-squared values of the models in this section are comparable to the main tests. All the F-statistics are again significant at the 1% level and thus the models can be interpreted.

The results for the models testing the first hypothesis are presented in table 11. The coefficients of PDIV for both the abnormal discretionary expenses as well as the discretionary expenses are significantly negative (-0.02 and -0.02 respectively) at a 1% level. In economic terms, this means that if a firm has paid a dividend for 5 consecutive years, the (abnormal) discretionary expenses are on average 0.02 (as a portion of total assets) lower than for firms who did not pay a persistent dividend. Comparing this to the descriptive statistics of discretionary expenses as a portion of total assets, the finding is economically significant. In contrast of the expectations, it is observed that the magnitude of the effect on discretionary expenses becomes weaker for persistent dividend payers. The results of the discretionary expenses models again indicate that persistent dividend paying firms engage more in upward real earnings management than firms which do not pay a persistent dividend.

However, in contrast to regular dividend paying firms, the coefficient for the asset sales model becomes significantly negative (-0.01) at a 1% level. This finding suggests that persistent dividend paying firms have on average 0.01 less asset sales as a portion of total assets. Again, this finding is economically significant since the difference between the minimum and maximum value of asset sales amounts only 0.82.

In sum, the results of the three models are mixed. On the one hand, the discretionary expenses models (model 1 and 2) suggest that persistent dividend payers engage on average in more upward real earnings management. But on the other hand, the asset sales model suggests that persistent dividend paying firms engage in less real earnings management through asset sales. Thus, the general hypothesis cannot be rejected nor can it be accepted.

**Table 11: Regression results for hypothesis 1 – PDIV**

| *Independent variables* | *Real earnings management proxy* | | | | | |
|---|---|---|---|---|---|---|
| | ADISX (1) | | DISX (2) | | ASSETSALES (3) | |
| | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Constant | 0.38* | *(0.07)* | 0.54*** | *(0.00)* | 0.02 | *(0.86)* |
| **PDIV** | **-0.02*** ** | ***(0.00)*** | **-0.02*** ** | ***(0.00)*** | **-0.01*** ** | ***(0.00)*** |
| SCALED_INTERCEPT | | | -67.50** | *(0.05)* | 11.98 | *(0.63)* |
| SALES_ASSETS_LAG | | | 0.15*** | *(0.00)* | 0.02 | *(0.54)* |
| LOSS | 0.05*** | *(0.00)* | 0.05*** | *(0.00)* | 0.02*** | *(0.00)* |
| SIZE | -0.02*** | *(0.00)* | -0.04*** | *(0.00)* | -0.01*** | *(0.00)* |
| BTM | -0.10*** | *(0.00)* | -0.10*** | *(0.00)* | -0.01*** | *(0.00)* |
| GROWTH | 0.17*** | *(0.00)* | 0.17*** | *(0.00)* | -0.01* | *(0.08)* |
| ROA | -0.35*** | *(0.00)* | -0.31*** | *(0.00)* | 0.07*** | *(0.00)* |
| RE | -0.04*** | *(0.00)* | -0.05*** | *(0.00)* | -0.01*** | *(0.00)* |
| CFO | 0.35*** | *(0.00)* | 0.31*** | *(0.00)* | 0.04** | *(0.04)* |
| AGE | -0.01* | *(0.09)* | -0.00 | *(0.40)* | -0.00 | *(0.84)* |
| LEV | -0.16*** | *(0.00)* | -0.19*** | *(0.00)* | -0.08*** | *(0.00)* |
| $BONUS_{t-1}$ | -0.02*** | *(0.00)* | -0.01** | *(0.05)* | -0.00 | *(0.42)* |
| STOCK | 0.03*** | *(0.00)* | 0.03*** | *(0.00)* | 0.01 | *(0.12)* |
| ANALYST | 0.01*** | *(0.00)* | 0.01*** | *(0.00)* | 0.00*** | *(0.00)* |
| INST | 0.05*** | *(0.00)* | 0.01* | *(0.07)* | -0.01** | *(0.03)* |
| Observations | 12144 | | 12144 | | 12144 | |
| Adjusted $R^2$ | 17.50% | | 59.95% | | 16.02% | |
| F-statistic | 30.61*** | | 79.36*** | | 10.99*** | |
| Industry-year interactions | No | | Yes | | Yes | |
| Industry Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

**Notes**: The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The values between the brackets represent the p-values for each coefficient. Continuous variables are winsorized at the top and bottom 1% level. For the DISX and ASSETSALES model, industry-year interactions are added to the model in accordance with Chen et al. (2018). The variable definitions are given in table 14 in the appendix.

The results for the second hypothesis are reported in table 12. Again, the coefficients of the pre-managed earnings change variable (PMEC#) are both significantly positive for model 4 and 5. The coefficients 0.87 and 0.78 suggest that firms with a 1% increase in pre-managed earnings change incur 0.87% and 0.78% more (abnormal) discretionary expenses as a portion of total assets. For model 6, the coefficient of PMEC# amounts -0.67 and is significant at a 1% level. This indicates that if a firm has a 1% increase in pre-managed earnings change, the firm sells on average 0.67% less of their assets as a portion of total assets.

In line with the expectations, the regression coefficients of the interaction term between the pre-managed earnings change variable and the persistent dividend payer dummy are significantly positive for both the discretionary expenses models. The coefficient amounts 0.02 for model 4 (significant at the 10% level) and the coefficient equals 0.06 for model 5 (significant at the 1% level). For model 5, this finding indicates that if a persistent dividend payer has a 1% increase in its pre-managed earnings, it will incur on average 0.06 more discretionary expenses as a portion of total assets than non-persistent payers. Moreover, the coefficient of the interaction term for the asset sales model is significantly negative (-0.06) at a 1% level. This finding indicates that if a persistent dividend payer has a 1% increase in its pre-managed earnings, it will sell on average 0.06 less of their assets as a portion of total assets than non-persistent payers. Compared to the minimum and maximum value of asset sales, these findings can be accepted as economically significant. See figure 4, 5 and 6 in the appendix for a visualization of the interaction effect.

However surprisingly, the magnitude of the coefficient for persistent dividend payers (PDIV) compared to firms who paid a dividend in the prior year ($DIV_{t-1}$) decreases for model 4, 5 and 6, which is against the predictions.

Furthermore, the individual t-tests of the regression coefficients indicate significance at a 10% level for model 7 and at a 1% level for model 8 and 9. Nevertheless, to assure the interaction term is interpretable, an analysis of variance is performed to assess whether the variables of interest, PDIV, PMEC# and their interaction term are jointly significant. In table 17 in the appendix, the F-values for hypothesis 2 are presented in panel B. The F-values are significant and thus the F-test rejects the null-hypothesis that at least one of the coefficients of the variables of interest equals zero. In other words, it can be concluded that the effect of having a pre-managed earnings change is different for persistent dividend payers compared to non-persistent payers. In conclusion, the results again confirm the hypothesis but the magnitude of the effect becomes weaker for persistent payers.

**Table 12: Regression results for hypothesis 2 – PDIV**

| *Independent variables* | *Real earnings management proxy* | | | | | |
|---|---|---|---|---|---|---|
| | ADISX (4) | | DISX (5) | | ASSETSALES (6) | |
| | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Constant | 0.03 | *(0.66)* | 0.18** | *(0.04)* | -0.03 | *(0.65)* |
| PDIV | 0.00 | *(0.83)* | -0.02*** | *(0.00)* | -0.01*** | *(0.02)* |
| PMEC# | 0.87*** | *(0.00)* | 0.78*** | *(0.00)* | -0.67*** | *(0.00)* |
| **PDIV*PMEC#** | **0.02*** | ***(0.07)*** | **0.06***** | ***(0.00)*** | **-0.06***** | ***(0.00)*** |
| SCALED_INTERCEPT | | | -31.67** | *(0.05)* | 15.84 | *(0.26)* |
| SALES_ASSETS_LAG | | | -0.02 | *(0.31)* | 0.01 | *(0.45)* |
| SIZE | -0.00*** | *(0.00)* | -0.01*** | *(0.00)* | -0.00 | *(0.26)* |
| BTM | -0.00 | *(0.21)* | -0.01*** | *(0.00)* | -0.01*** | *(0.00)* |
| GROWTH | -0.07*** | *(0.00)* | -0.06*** | *(0.00)* | 0.08*** | *(0.00)* |
| RE | 0.00 | *(0.77)* | -0.00 | *(0.12)* | -0.01*** | *(0.00)* |
| CFO | -0.18*** | *(0.00)* | -0.16*** | *(0.00)* | 0.16*** | *(0.00)* |
| AGE | -0.01*** | *(0.00)* | -0.01*** | *(0.00)* | 0.01*** | *(0.00)* |
| LEV | -0.01 | *(0.39)* | -0.02*** | *(0.00)* | -0.04*** | *(0.00)* |
| $BONUS_{t-1}$ | -0.00 | *(0.81)* | 0.00 | *(0.50)* | -0.00 | *(0.11)* |
| STOCK | 0.02*** | *(0.00)* | 0.02*** | *(0.00)* | -0.00 | *(0.12)* |
| ANALYST | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* |
| INST | 0.02*** | *(0.00)* | 0.01** | *(0.03)* | -0.01** | *(0.03)* |
| Observations | 12144 | | 12144 | | 12144 | |
| Adjusted $R^2$ | 77.11% | | 90.95% | | 72.80% | |
| F-statistic | 471.3*** | | 526.9*** | | 141.1*** | |
| Industry-year interactions | No | | Yes | | Yes | |
| Industry Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

**Notes**: The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The '#' indicates that the PMEC variable is specific for either ADISX, DISX or ASSETSALES. The values between the brackets represent the p-values for each coefficient. Continuous variables are winsorized at the top and bottom 1% level. For the DISX and ASSETSALES model, industry-year interactions are added to the model in accordance with Chen et al. (2018). The variable definitions are given in table 14 in the appendix.

The regression results for the third hypothesis are reported in table 13. The regression coefficient of the indicator variable PDIV becomes insignificant for all models. Furthermore, the coefficient of the variable COVRISK is again significantly positive at a 1% level and equals 0.06 for both model 7 and 8 and 0.05 for model 9. These findings suggest that on average, firms who have an interest coverage ratio equal or below 2 incur more discretionary expenses and sell more of their assets as a fraction of total assets.

The regression coefficients of the interaction term between persistent dividend paying firms and the firms with an interest coverage ratio equal or below 2 equals -0.09 at a significance level of 1% for both model 7 and 8. The coefficient of -0.02 becomes insignificant for model 9 (compared to table 10). These findings suggest that persistent dividend paying firms with a high covenant risk incur on average 0.09 less (abnormal) discretionary expenses as a portion of total assets. For example, a persistent payer with an interest coverage ratio equal or below 2 has on average a 9% lower ratio of discretionary expenses to total assets than a non-persistent payer which also has an interest coverage ratio higher than 2. Taking into account the distribution of the discretionary expenses variables, this finding can be marked as economically significant. This is in line with the hypothesis that (persistent) dividend paying firms engage in more upward earnings management than non-paying firms to circumvent debt covenants. In line with the expectations, the magnitude of the effect becomes (slightly) more severe for persistent dividend paying firms. That is because the coefficient of model 7 shifts from -0.08 to -0.09. See figure 7, 8 and 9 in the appendix for a visualization of the interaction effect.

The individual t-tests of the regression coefficients indicate significance at a 1% level for model 7 and 8 and insignificance for model 9. To assure the interaction term is interpretable, an analysis of variance is performed to assess whether the variables of interest, PDIV, COVRISK and their interaction term are jointly significant. In table 17 in the appendix, the F-values for hypothesis 3 are presented in panel C. The F-values are significant and thus the F-test rejects the null-hypothesis that at least one of the coefficients of the variables of interest equals zero. In other words, it can be concluded that the effect of having a covenant risk is different for persistent dividend payers compared to non-persistent payers.

In sum, the findings confirm the notion that persistent dividend payers engage in more cost cutting behavior than non-persistent payers. Since the model using asset sales as a proxy for real earnings management becomes insignificant, only model 7 and 8 can be interpreted for testing the hypothesis. Thus, hypothesis 3 stating that dividend paying firms engage in more downward real earnings management than firms which do not pay a dividend to circumvent debt covenants is also accepted when using PDIV as independent variable.

**Table 13: Regression results for hypothesis 3 – PDIV**

| *Independent variables* | *Real earnings management proxy* | | | | | |
|---|---|---|---|---|---|---|
| | ADISX (7) | | DISX (8) | | ASSETSALES (9) | |
| | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Constant | 0.43** | *(0.03)* | 0.48*** | *(0.01)* | 0.01 | *(0.96)* |
| PDIV | -0.00 | *(0.32)* | -0.00 | *(0.47)* | 0.00 | *(0.43)* |
| COVRISK | 0.06*** | *(0.00)* | 0.06*** | *(0.00)* | 0.05*** | *(0.00)* |
| **PDIV*COVRISK** | **-0.09*** ** | ***(0.00)*** | **-0.09*** ** | ***(0.00)*** | **-0.02** | ***(0.17)*** |
| SCALED_INTERCEPT | | | -46.37 | *(0.37)* | 9.56 | *(0.81)* |
| SALES_ASSETS_LAG | | | 0.10** | *(0.02)* | -0.01 | *(0.97)* |
| LOSS | 0.02*** | *(0.01)* | 0.01** | *(0.05)* | 0.00 | *(0.58)* |
| SIZE | -0.03*** | *(0.00)* | -0.04*** | *(0.00)* | -0.00*** | *(0.01)* |
| BTM | -0.00 | *(0.44)* | -0.00 | *(0.42)* | -0.00*** | *(0.01)* |
| GROWTH | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* | -0.00* | *(0.10)* |
| ROA | -0.13*** | *(0.00)* | -0.16*** | *(0.00)* | 0.03 | *(0.22)* |
| RE | -0.02*** | *(0.00)* | -0.03*** | *(0.00)* | -0.00* | *(0.06)* |
| CFO | 0.12*** | *(0.00)* | 0.20*** | *(0.00)* | 0.09*** | *(0.00)* |
| AGE | -0.01* | *(0.06)* | -0.01* | *(0.10)* | -0.00 | *(0.56)* |
| $BONUS_{t-1}$ | 0.01*** | *(0.00)* | 0.00 | *(0.14)* | 0.00 | *(0.70)* |
| STOCK | 0.08*** | *(0.00)* | 0.01*** | *(0.00)* | 0.01** | *(0.05)* |
| ANALYST | 0.01*** | *(0.00)* | 0.01** | *(0.02)* | 0.00*** | *(0.00)* |
| INST | 0.01*** | *(0.01)* | -0.002 | *(0.87)* | -0.00 | *(0.62)* |
| Observations | 9912 | | 9912 | | 9912 | |
| Adjusted $R^2$ | 12.79% | | 60.23% | | 8.78% | |
| F-statistic | 17.51*** | | 65.42*** | | 5.10*** | |
| Industry-year interactions | No | | Yes | | Yes | |
| Industry Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

**Notes**: The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The values between the brackets represent the p-values for each coefficient. Continuous variables are winsorized at the top and bottom 1% level. For the DISX and ASSETSALES model, industry-year interactions are added to the model in accordance with Chen et al. (2018). The variable definitions are given in table 14 in the appendix.

# 6. Conclusion

## 6.1 Discussion of the results

This thesis examines whether dividend policy plays a role in real earnings management. The findings of the first test suggests that, generally speaking, dividend paying firms have on average less discretionary expenses (as a portion of total assets) compared to non-dividend payers. This indicates that dividend paying firms engage in more upward real earnings management by cutting away discretionary expenses. Although it is against the expectations, this finding might however not be fully surprising. That is, because the strong controlling of discretionary costs might contribute to the fact that the firm is paying a dividend. The earnings quality of a firm increases if abnormal or 'unnecessary' costs are being left out. To conclude, firms with a dividend policy engage in general in more upward real earnings management than non-paying firms to ensure no unnecessary costs are incurred and dividends can be maintained.

The findings of the second hypothesis indicate that dividend paying firms engage in more real earnings smoothing than non-paying firms. In times of positive pre-managed earnings changes, dividend paying firms incur more discretionary expenses and if the pre-managed earnings change declines, payers incur less discretionary expenses compared to non-dividend payers. The findings are in line with survey evidence of earnings smoothing by dividend payers conducted by Brav et al. (2005) and Graham et al. (2005). In conclusion, dividend policy plays a smoothing role towards real earnings management.

The findings of the third hypothesis indicate that dividend paying firms with a low interest coverage ratio (below 2) have on average less discretionary expenses. This is in line with the hypothesis that dividend paying firms engage in upward real earnings management to circumvent dividend restrictions in debt covenants.

The findings of the tests contribute to answering the research question of this thesis:

*Does dividend policy play a role in real earnings management?*

The answer is yes, dividend policy does play a role in earnings management. Generally speaking, the role of dividend policy is associated with higher levels of real earnings management in the sense that these firms cut away the abnormal expenses to be more able to pay dividends. Dividend policy also plays a smoothing in the sense that earnings can be managed downwards by taking additional expenses to prevent large earnings surprises. Finally, dividend policy plays a role in upward real earnings management since dividend paying firms have more incentive to avoid violating a debt covenant.

## 6.2 Contribution

Where prior research finds that dividend payers have better earnings quality in terms of accruals, the findings of this study suggest that dividend payers in general manage their earnings upward via the discretionary expenses accounts. This research contributes the literature in a way suggesting that real earnings management is a more reliable concept for dividend payers than accrual-based earnings management. Furthermore, the contradicting and ambiguous conclusions in the literature regarding dividend policy and earnings management are mainly due to the different situations which are being tested for dividend payers. The findings of this study contribute the literature by showing that managers of dividend paying firms behave differently than non-payers in different situations and that managers of dividend paying companies have incentives to either engage in upward or downward real earnings management. Another important contribution to the literature is the research method which is used in this study. This study is one of the few studies which takes into account the critical papers of McNichols and Stubben (2018) and Chen et al. (2018). This research proxies for real earnings management in a

way that better articulates the story for dividend payers using discretionary expenses and asset sales. Moreover, while this study maintains to use a two-stage procedure to stay in line with prior literature, a one-stage procedure according to the method proposed by Chen et al. (2018) is being used to prevent biased coefficients and standard errors. Also, where prior literature uses firm leverage (e.g. debt-to-assets or debt-to-equity ratio), this research utilizes the interest coverage ratio is a variable to assess whether firms are more risky to violate a debt covenant. This variable is a more reliable proxy since it is a measure which is proven to be more prevalent in dividend restrictions in debt covenants. The results of hypothesis 3 thus contribute the literature that the leverage variable might not be the most accurate proxy anymore for testing the risk of violating a debt covenant and that the interest coverage ratio is a suitable substitute.

The results of this study clearly indicate that dividend paying firms behave differently than non-paying firms with respect to discretionary expenses and, in a less pronounced way, asset sales. The managerial behavior which is being analyzed is, strictly taken, not illegal. However, auditors and policymakers should take into account that having a dividend policy clearly alters managerial behavior and that engaging in real earnings management could be the start of engaging in other practices that are more limit-testing. The main contribution of this paper is thus the clear evidence of different managerial behavior for dividend paying firms.

## 6.3 Limitations

As every research paper, this research also has its limitations. First, this research is merely academic, its relevance for practitioners is limited in a sense that no illegal behavior is observed. In other words, this study does not solve a problem, it merely provides evidence of deviating managerial behavior. Second, I find merely an association between dividend payers and real earnings management. That is, because having a dividend policy by itself does not cause the deviating managerial behavior, it only provides more incentives. Thus, no inferences about causal effects can be made. Third, the measurement of the independent variables has its limitations. The 5 year period for deriving whether a firm is a persistent dividend payer is very subjective. Also, the results of the additional tests do not provide undisputable proof that five years of consecutive payments creates large differences among the between regular dividend payers and persistent dividend payers. Finally, real earnings management can be proxied in multiple ways, discretionary expenses, asset sales but also production costs and cash flow from operations. Although, it is attempted to use the proxies which most accurately describe the account where real earnings management would occur, every firm is different and could engage in real earnings management practices through the account which most appropriately suits the specific firm in a specific year.

## 6.4 Future research

During the process of conducting the analysis and after finding the results, some interesting ideas for future research came up. First, the findings suggest that in terms of earnings quality dividend payers have less abnormal discretionary expenses. An interesting research idea would be whether real earnings management is a substitute for accrual-based earnings management for dividend paying firms. Second, dividend paying firms can payout not only through cash dividends, but also via stock repurchases and stock dividends. An interesting research idea would be whether among dividend paying firms, the ratio stock dividend to cash dividend changes if the firm faces a high covenant risk. Especially in years which can be labeled as economic crisis years (e.g. the financial crisis in 2008 and 2009). Finally, this research utilizes the interest coverage ratio to determine the covenant risk of a firm. Clearly, the interest rate must affect this interest coverage ratio and could therefore affect managerial behavior with respect to debt covenants. An interest research would thus be whether the interest rate affects real earnings management behavior for dividend paying firms

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# Appendix

**Table 14: Variable descriptions**

| Variable | Data source | Description |
|---|---|---|
| **ADISX** | Compustat North America | Abnormal discretionary expenses are derived from the residuals of regression A. |
| **AGE** | Compustat North America | The natural logarithm of the firm age in year t. The firm age is calculated by subtracting year t with the first year of occurrence in the Compustat database. |
| **ANALYST** | I/B/E/S Summary | The number of analysts who issued annual earnings per share forecasts in the current year. |
| **ASSETSALES** | Compustat North America | The sum of investment, property, plant and equipment sales scaled by lagged total assets. |
| **BONUS$_{t-1}$** | Execucomp | Bonus of the CEO in the prior year divided by lagged total assets. |
| **BTM** | Compustat North America | Book-to-market ratio calculated by dividing the book value by the closing price times the number of common shares outstanding. |
| **CFO** | Compustat North America | Cash flow from operations scaled by lagged total assets. |
| **COVRISK** | Compustat North America | Indicator variable taking the value of 1 if the firms has an interest coverage ratio equal or below 2. |
| **DISX** | Compustat North America | Discretionary expenses are calculated as the sum of the advertising costs, research and development costs and selling, general and administrative costs divided by lagged total assets. |
| **DIV$_{t-1}$** | Compustat North America | Dummy variable taking the value of 1 if the firm paid a cash dividend on common stock in the prior year. |
| **GROWTH** | Compustat North America | Growth variable calculated by dividing the revenue change compared to prior year by the revenue of the prior year. |
| **INST** | Thomson Reuters 13f file | The total number of shares held by institutional investors divided by the total shares outstanding. |
| **LEV** | Compustat North America | Total debt divided by total assets. |
| **LOSS** | Compustat North America | Dummy variable which takes the value of 1 if the earnings before extraordinary items available for common shareholders is below zero. |
| **PDIV** | Compustat North America | Dummy variable taking the value of 1 for all firm observations if the firm paid a cash dividend on common stock for 5 consecutive years. |
| **PMEC_ ASSETSALES** | Compustat North America | Pre-managed earnings change is calculated as the earnings before extraordinary items minus the amount of asset sales scaled by lagged total assets (ASSETSALES) denoted in the tables by PMEC#. |

*continued*

**Table 14: Variable descriptions – continued**

| Variable | Data source | Description |
|---|---|---|
| **PMEC_ADISX** | Compustat North America | Pre-managed earnings change is calculated as the earnings before extraordinary items plus the abnormal discretionary expenses (ADISX) denoted in the tables by PMEC#. |
| **PMEC_DISX** | Compustat North America | Pre-managed earnings change is calculated as the earnings before extraordinary items plus the discretionary expenses (DISX) denoted in the tables by PMEC#. |
| **RE** | Compustat North America | Retained earnings is calculated as the retained earnings divided by lagged total assets. |
| **ROA** | Compustat North America | Return on assets is calculated by dividing the income before extraordinary items available for common shareholders by the average total assets. |
| **SALES_ASSETS_LAG** | Compustat North America | The sales assets lag is being calculated by dividing lagged total sales with lagged total assets $\left(\frac{Sales_{it-1}}{Assets_{it-1}}\right)$. |
| **SCALED_INTERCEPT** | Compustat North America | The scaled intercept is calculated by 1 divided by lagged total assets. $\left(\frac{1}{Assets_{it-1}}\right)$. |
| **SIZE** | Compustat North America | Natural logarithm of total assets. |
| **STOCK** | Execucomp | To derive the stock incentive ratio, I first derive the sensitivity (ONEPCT) of equity compensation to a 1 percent change in stock price. This is calculated by 0.01 * Share price * Shares owned by the executive, including options that are exercisable or will become exercisable within 60 days. The variable STOCK is then calculated by ONEPCT divided by ONEPCT + SALARY + $BONUS_{t-1}$. |

**Table 15: Descriptive statistics – Persistent Payers vs. Non-Persistent Payers**

| | *Persistent payers (N=4.344)* | | | | | | *Non-persistent payers (N=7.800)* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Mean | Std. Dev. | Min | 25th Perc. | 75th Perc. | Max | Mean | Std. Dev. | Min | 25th Perc. | 75th Perc. | Max |
| ADISX | -0,04 | 0,16 | -0,76 | -0,12 | 0,04 | 1,10 | 0,02 | 0,25 | -1,87 | -0,10 | 0,10 | 3,60 |
| DISX | 0,28 | 0,22 | 0,00 | 0,12 | 0,40 | 1,49 | 0,37 | 0,30 | 0,00 | 0,15 | 0,51 | 1,49 |
| ASSETSALES | 0,03 | 0,10 | 0,00 | 0,00 | 0,01 | 0,82 | 0,07 | 0,16 | 0,00 | 0,00 | 0,02 | 0,82 |
| $DIV_{t-1}$ | 1,00 | 0,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,15 | 0,36 | 0,00 | 0,00 | 0,00 | 1,00 |
| PDIV | 1,00 | 0,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| PMEC_ADISX | -0,03 | 0,17 | -0,50 | -0,13 | 0,05 | 0,95 | 0,03 | 0,25 | -0,50 | -0,12 | 0,12 | 0,95 |
| PMEC_DISX | 0,29 | 0,23 | -0,12 | 0,12 | 0,41 | 1,65 | 0,39 | 0,33 | -0,12 | 0,15 | 0,53 | 1,65 |
| PMEC_ASSETSALES | -0,03 | 0,12 | -0,86 | -0,03 | 0,01 | 0,37 | -0,06 | 0,19 | -0,86 | -0,08 | 0,02 | 0,37 |
| COVRISK | 0,10 | 0,30 | 0,00 | 0,00 | 0,00 | 1,00 | 0,26 | 0,44 | 0,00 | 0,00 | 1,00 | 1,00 |
| LOSS | 0,09 | 0,28 | 0,00 | 0,00 | 0,00 | 1,00 | 0,23 | 0,42 | 0,00 | 0,00 | 0,00 | 1,00 |
| SIZE | 8,16 | 1,60 | 3,65 | 7,00 | 9,19 | 13,57 | 7,08 | 1,54 | 1,46 | 6,03 | 7,95 | 13,61 |
| BTM | 0,42 | 0,32 | -0,29 | 0,21 | 0,54 | 2,00 | 0,48 | 0,40 | -0,29 | 0,22 | 0,66 | 2,00 |
| GROWTH | 0,05 | 0,15 | -0,43 | -0,01 | 0,10 | 1,17 | 0,11 | 0,24 | -0,43 | 0,00 | 0,18 | 1,17 |
| ROA | 0,07 | 0,07 | -0,46 | 0,04 | 0,10 | 0,31 | 0,04 | 0,12 | -0,46 | 0,01 | 0,09 | 0,31 |
| RE | 0,41 | 0,34 | -1,72 | 0,22 | 0,59 | 1,36 | -0,08 | 1,01 | -5,04 | -0,14 | 0,41 | 1,36 |
| CFO | 0,13 | 0,07 | -0,24 | 0,08 | 0,16 | 0,41 | 0,11 | 0,11 | -0,26 | 0,06 | 0,17 | 0,41 |
| AGE | 3,53 | 0,52 | 1,79 | 3,18 | 3,99 | 4,25 | 2,86 | 0,65 | 0,69 | 2,48 | 3,26 | 4,25 |
| LEV | 0,23 | 0,17 | 0,00 | 0,10 | 0,33 | 0,81 | 0,20 | 0,20 | 0,00 | 0,00 | 0,32 | 0,81 |
| $BONUS_{t-1}$ | 0,09 | 0,34 | 0,00 | 0,00 | 0,00 | 2,99 | 0,18 | 0,52 | 0,00 | 0,00 | 0,00 | 2,99 |
| STOCK | 0,25 | 0,22 | 0,00 | 0,09 | 0,34 | 1,00 | 0,25 | 0,26 | 0,00 | 0,06 | 0,36 | 1,00 |
| ANALYST | 11,83 | 8,19 | 1,00 | 5,00 | 17,00 | 45,00 | 9,83 | 7,76 | 1,00 | 4,00 | 13,00 | 55,00 |
| INST | 0,76 | 0,22 | 0,01 | 0,68 | 0,90 | 1,20 | 0,80 | 0,23 | 0,01 | 0,70 | 0,95 | 1,20 |

**Notes:** The sample consists of a total of 12.144 observations of which 4.344 are persistent dividend payers. Continuous variables are winsorized at the top and bottom 1% level. The variable definitions are given in table 14 in the appendix.

**Table 16: ANOVA F-test – $DIV_{t-1}$**

| | *ADISX (7)* | | | | *DISX (8)* | | | | *ASSETSALES (9)* | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Source | Sum Sq | Df | F-value | P-value | Sum Sq | Df | F-value | P-value | Sum Sq | Df | F-value | P-value |
| **Panel A: Hypothesis 1** | | | | | | | | | | | | |
| $DIV_{t-1}$ | 2.10 | 1 | 51.42*** | *(0.00)* | 2.03 | 1 | 65.99*** | *(0.00)* | 0.05 | 1 | 3.24* | *(0.07)* |
| Residuals | 492.33 | 12056 | | | 366.50 | 11911 | | | 196.67 | 11911 | | |
| **Panel B: Hypothesis 2** | | | | | | | | | | | | |
| $DIV_{t-1}$ | 0.03 | 1 | 2.45 | *(0.12)* | 0.60 | 1 | 86.06*** | *(0.00)* | 0.12 | 1 | 22.51*** | *(0.00)* |
| PMEC# | 248.57 | 1 | 22071.83*** | *(0.00)* | 233.415 | 1 | 33572.04*** | *(0.00)* | 95.03 | 1 | 17884.95*** | *(0.00)* |
| $DIV_{t-1}$ * PMEC# | 1.193 | 1 | 105.90*** | *(0.00)* | 0.79 | 1 | 113.60*** | *(0.00)* | 0.56 | 1 | 104.87*** | *(0.00)* |
| Joint significance | 374.27 | 3 | 11078.00*** | *(0.00)* | 297.73 | 3 | 14274.00*** | *(0.00)* | 133.75 | 3 | 8390.60*** | *(0.00)* |
| Residuals | 135.77 | 12056 | | | 82.81 | 11911 | | | 63.29 | 11911 | | |
| **Panel C: Hypothesis 3** | | | | | | | | | | | | |
| $DIV_{t-1}$ | 0.69 | 1 | 20.28*** | *(0.00)* | 0.52 | 1 | 16.28*** | *(0.00)* | 0.09 | 1 | 4.66** | *(0.03)* |
| COVRISK | 2.15 | 1 | 62.28*** | *(0.00)* | 2.41 | 1 | 75.14*** | *(0.00)* | 1.25 | 1 | 63.36*** | *(0.00)* |
| $DIV_{t-1}$ * COVRISK | 1.05 | 1 | 30.71*** | *(0.00)* | 1.39 | 1 | 43.44*** | *(0.00)* | 0.06 | 1 | 2.98* | *(0.08)* |
| Joint significance | 3.70 | 3 | 36.03*** | *(0.00)* | 3.89 | 3 | 40.46*** | *(0.00)* | 1.39 | 3 | 23.53*** | *(0.00)* |
| Residuals | 336.52 | 9823 | | | 309.94 | 9678 | | | 190.66 | 9678 | | |

**Notes:** The joint significance tests the null hypothesis: $\beta DIV_{t-1} = \beta PMEC\# = \beta DIV_{t-1} * PMEC\# = 0$ and $\beta DIV_{t-1} = \beta COVRISK = \beta DIV_{t-1} * COVRISK = 0$. The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The '#' indicates that the PMEC variable is specific for either ADISX, DISX or ASSETSALES. The sample consists of a total of 12.144 observations of which 5.508 are dividend payers. Continuous variables are winsorized at the top and bottom 1% level. The variable definitions are given in table 14 in the appendix.

**Table 17: ANOVA F-test – PDIV**

| | *ADISX (7)* | | | | *DISX (8)* | | | | *ASSETSALES (9)* | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Source | Sum Sq | Df | F-value | P-value | Sum Sq | Df | F-value | P-value | Sum Sq | Df | F-value | P-value |
| **Panel A: Hypothesis 1** | | | | | | | | | | | | |
| PDIV | 0.86 | 1 | 21.03 | *(0.00)* | 0.75 | 1 | 24.36*** | *(0.00)* | 0.21 | 1 | 12.67*** | *(0.00)* |
| Residuals | 493.57 | 12056 | | | 367.78 | 11911 | | | 196.51 | 11911 | | |
| **Panel B: Hypothesis 2** | | | | | | | | | | | | |
| PDIV | 0.00 | 1 | 0.05 | *(0.83)* | 0.36 | 1 | 51.36*** | *(0.00)* | 0.09 | 1 | 15.96*** | *(0.00)* |
| PMEC# | 291.96 | 1 | 25706.00*** | *(0.00)* | 253.57 | 1 | 36335.00*** | *(0.00)* | 109.60 | 1 | 20510.18*** | *(0.00)* |
| PDIV * PMEC# | 0.037 | 1 | 3.29* | *(0.07)* | 0.50 | 1 | 71.93*** | *(0.00)* | 0.19 | 1 | 35.28*** | *(0.00)* |
| Joint significance | 373.12 | 3 | 10950.00*** | *(0.00)* | 297.42 | 3 | 14206.00*** | *(0.00)* | 133.39 | 3 | 8320.80*** | *(0.00)* |
| Residuals | 136.93 | 12056 | | | 83.12 | 11911 | | | 63.65 | 11911 | | |
| **Panel C: Hypothesis 3** | | | | | | | | | | | | |
| PDIV | 0.69 | 1 | 20.28*** | *(0.00)* | 0.52 | 1 | 16.28*** | *(0.00)* | 0.09 | 1 | 4.66** | *(0.03)* |
| COVRISK | 2.15 | 1 | 62.28*** | *(0.00)* | 2.41 | 1 | 75.14*** | *(0.00)* | 1.25 | 1 | 63.36*** | *(0.00)* |
| PDIV * COVRISK | 1.05 | 1 | 30.71*** | *(0.00)* | 1.39 | 1 | 43.44*** | *(0.00)* | 0.06 | 1 | 2.98* | *(0.08)* |
| Joint significance | 2.53 | 3 | 24.50*** | *(0.00)* | 2.71 | 3 | 28.07*** | *(0.00)* | 1.31 | 3 | 22.20*** | *(0.00)* |
| Residuals | 336.52 | 9823 | | | 309.94 | 9678 | | | 190.66 | 9678 | | |

**Notes:** The joint significance tests the null hypothesis: ***βPDIV = βPMEC# = βPDIV * PMEC# = 0*** and ***βPDIV = βCOVRISK = βPDIV * COVRISK = 0.*** The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The '#' indicates that the PMEC variable is specific for either ADISX, DISX or ASSETSALES. The sample consists of a total of 12.144 observations of which 4.344 are persistent dividend payers. Continuous variables are winsorized at the top and bottom 1% level. The variable definitions are given in table 14 in the appendix.

**Table 18: Regression results for hypothesis 1 – $DIV_{t-1}$ (no winsorization)**

| *Independent variables* | *Real earnings management proxy* | | | | | |
|---|---|---|---|---|---|---|
| | ADISX (1) | | DISX (2) | | ASSETSALES (3) | |
| | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Constant | 0.44** | *(0.04)* | 0.52** | *(0.02)* | 0.01 | *(0.99)* |
| **$DIV_{t-1}$** | **-0.04*** ** | ***(0.00)*** | **-0.04*** ** | ***(0.00)*** | **-0.01** ** | ***(0.05)*** |
| SCALED_INTERCEPT | | | -29.64 | *(0.45)* | 5.16 | *(0.93)* |
| SALES_ASSETS_LAG | | | 0.12** | *(0.02)* | 0.04 | *(0.60)* |
| LOSS | 0.04*** | *(0.00)* | 0.04*** | *(0.00)* | 0.03*** | *(0.00)* |
| SIZE | -0.03*** | *(0.00)* | -0.04*** | *(0.00)* | -0.01*** | *(0.00)* |
| BTM | -0.00 | *(0.34)* | -0.00 | *(0.45)* | -0.00* | *(0.10)* |
| GROWTH | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* | -0.00 | *(0.31)* |
| ROA | -0.24*** | *(0.00)* | -0.29*** | *(0.00)* | 0.08** | *(0.04)* |
| RE | -0.03*** | *(0.00)* | -0.04*** | *(0.00)* | -0.01*** | *(0.01)* |
| CFO | 0.30*** | *(0.00)* | 0.38*** | *(0.00)* | 0.05 | *(0.12)* |
| AGE | -0.01*** | *(0.00)* | -0.02*** | *(0.00)* | 0.00 | *(0.55)* |
| LEV | -0.09*** | *(0.00)* | -0.11*** | *(0.00)* | -0.11*** | *(0.00)* |
| $BONUS_{t-1}$ | 0.00 | *(0.97)* | 0.00 | *(0.29)* | -0.00 | *(0.36)* |
| STOCK | 0.06*** | *(0.00)* | 0.07*** | *(0.00)* | -0.01 | *(0.41)* |
| ANALYST | 0.01*** | *(0.00)* | 0.01*** | *(0.00)* | 0.01*** | *(0.00)* |
| INST | 0.02*** | *(0.00)* | 0.01** | *(0.02)* | -0.01* | *(0.10)* |
| Observations | 12.144 | | 12.144 | | 12.144 | |
| Adjusted $R^2$ | 13.21% | | 58.93% | | 12.39% | |
| F-statistic | 22.24*** | | 76.10*** | | 8.40*** | |
| Industry-year interactions | No | | Yes | | Yes | |
| Industry Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

**Notes**: The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The values between the brackets represent the p-values for each coefficient. Continuous variables are winsorized at the top and bottom 1% level. For the DISX and ASSETSALES model, industry-year interactions are added to the model in accordance with Chen et al. (2018). The variable definitions are given in table 14 in the appendix.

**Table 19: Regression results for hypothesis 2 – $DIV_{t-1}$ (no winsorization)**

| *Independent variables* | *Real earnings management proxy* | | | | | |
|---|---|---|---|---|---|---|
| | ADISX (4) | | DISX (5) | | ASSETSALES (6) | |
| | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Constant | 0,12 | *(0.32)* | 0.26** | *(0.03)* | 0.04 | *(0.72)* |
| $DIV_{t-1}$ | -0.00 | *(0.74)* | -0.07*** | *(0.00)* | -0.03*** | *(0.00)* |
| PMEC# | 0.57*** | *(0.00)* | 0.60*** | *(0.00)* | -0.48*** | *(0.00)* |
| **$DIV_{t-1}$*PMEC#** | **0.32*** ** | ***(0.00)*** | **0.18*** ** | ***(0.00)*** | **-0.48*** ** | ***(0.00)*** |
| SCALED_INTERCEPT | | | -52.86** | *(0.02)* | 3.96 | *(0.85)* |
| SALES_ASSETS_LAG | | | -0.04 | *(0.20)* | -0.00 | *(0.95)* |
| SIZE | -0.01*** | *(0.00)* | -0.02*** | *(0.00)* | -0.01*** | *(0.00)* |
| BTM | -0.00 | *(0.42)* | -0.00 | *(0.69)* | -0.00** | *(0.03)* |
| GROWTH | -0.00*** | *(0.00)* | -0.00*** | *(0.00)* | 0.00*** | *(0.00)* |
| RE | -0.01*** | *(0.00)* | -0.01*** | *(0.06)* | -0.01*** | *(0.00)* |
| CFO | -0.23*** | *(0.00)* | -0.19*** | *(0.00)* | 0.23*** | *(0.00)* |
| AGE | -0.01*** | *(0.00)* | -0.01*** | *(0.00)* | 0.00* | *(0.07)* |
| LEV | -0.02*** | *(0.00)* | -0.02*** | *(0.00)* | -0.04*** | *(0.00)* |
| $BONUS_{t-1}$ | 0.01*** | *(0.00)* | 0.00 | *(0.65)* | -0.00 | *(0.48)* |
| STOCK | 0.03*** | *(0.00)* | 0.02*** | *(0.00)* | 0.01 | *(0.20)* |
| ANALYST | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* |
| INST | 0.01*** | *(0.00)* | 0.00 | *(0.35)* | -0.00 | *(0.89)* |
| Observations | 12.144 | | 12.144 | | 12.144 | |
| Adjusted $R^2$ | 71.22% | | 86.06% | | 87.23% | |
| F-statistic | 346.4.20*** | | 324.00*** | | 358.50*** | |
| Industry-year interactions | No | | Yes | | Yes | |
| Industry Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

**Notes**: The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The '#' indicates that the PMEC variable is specific for either ADISX, DISX or ASSETSALES. The values between the brackets represent the p-values for each coefficient. Continuous variables are winsorized at the top and bottom 1% level. For the DISX and ASSETSALES model, industry-year interactions are added to the model in accordance with Chen et al. (2018). The variable definitions are given in table 14 in the appendix.

**Table 20: Regression results for hypothesis 3 – $DIV_{t-1}$ (no winsorization)**

| *Independent variables* | *Real earnings management proxy* | | | | | |
|---|---|---|---|---|---|---|
| | ADISX (7) | | DISX (8) | | ASSETSALES (9) | |
| | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Constant | 0.43** | *(0.03)* | 0.43*** | *(0.00)* | 0.00 | *(0.98)* |
| $DIV_{t-1}$ | -0.02*** | *(0.00)* | -0.02*** | *(0.00)* | 0.01** | *(0.04)* |
| COVRISK | 0.06*** | *(0.00)* | -0.07*** | *(0.00)* | 0.05*** | *(0.02)* |
| **$DIV_{t-1}$*COVRISK** | **-0.08*** ** | ***(0.00)*** | **-0.09*** ** | ***(0.04)*** | **-0.02*** | ***(0.09)*** |
| SCALED_INTERCEPT | | | -56.94 | *(0.27)* | 11.40 | *(0.78)* |
| SALES_ASSETS_LAG | | | 0.16** | *(0.02)* | -0.00 | *(0.99)* |
| LOSS | 0.02** | *(0.03)* | 0.01* | *(0.10)* | 0.00 | *(0.53)* |
| SIZE | -0.03*** | *(0.00)* | -0.04*** | *(0.00)* | -0.01*** | *(0.00)* |
| BTM | -0.00 | *(0.48)* | -0.00 | *(0.48)* | -0.00*** | *(0.00)* |
| GROWTH | 0.00*** | *(0.00)* | 0.00*** | *(0.00)* | -0.00* | *(0.10)* |
| ROA | -0.13*** | *(0.00)* | -0.16*** | *(0.00)* | 0.03 | *(0.21)* |
| RE | -0.02*** | *(0.00)* | -0.03*** | *(0.00)* | -0.00** | *(0.05)* |
| CFO | -0.12*** | *(0.00)* | 0.21*** | *(0.00)* | 0.09*** | *(0.00)* |
| AGE | -0.00 | *(0.25)* | -0.00 | *(0.28)* | -0.00 | *(0.39)* |
| $BONUS_{t-1}$ | 0.01*** | *(0.01)* | -0.00 | *(0.16)* | -0.00 | *(0.68)* |
| STOCK | 0.08*** | *(0.00)* | 0.08*** | *(0.00)* | 0.01** | *(0.05)* |
| ANALYST | 0.01*** | *(0.00)* | 0.01*** | *(0.00)* | 0.00*** | *(0.00)* |
| INST | 0.01** | *(0.02)* | 0.01** | *(0.03)* | -0.00 | *(0.68)* |
| Observations | 9.912 | | 9.912 | | 9.912 | |
| Adjusted $R^2$ | 13.09% | | 60.38% | | 8.82% | |
| F-statistic | 17.96*** | | 65.83*** | | 5.12*** | |
| Industry-year interactions | No | | Yes | | Yes | |
| Industry Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

**Notes**: The *,**,*** indicate significant coefficients at a 10%, 5% and 1% confidence level respectively. The values between the brackets represent the p-values for each coefficient. Continuous variables are winsorized at the top and bottom 1% level. For the DISX and ASSETSALES model, industry-year interactions are added to the model in accordance with Chen et al. (2018). The variable definitions are given in table 14 in the appendix.

**Figure 1: Libby boxes hypothesis 1**

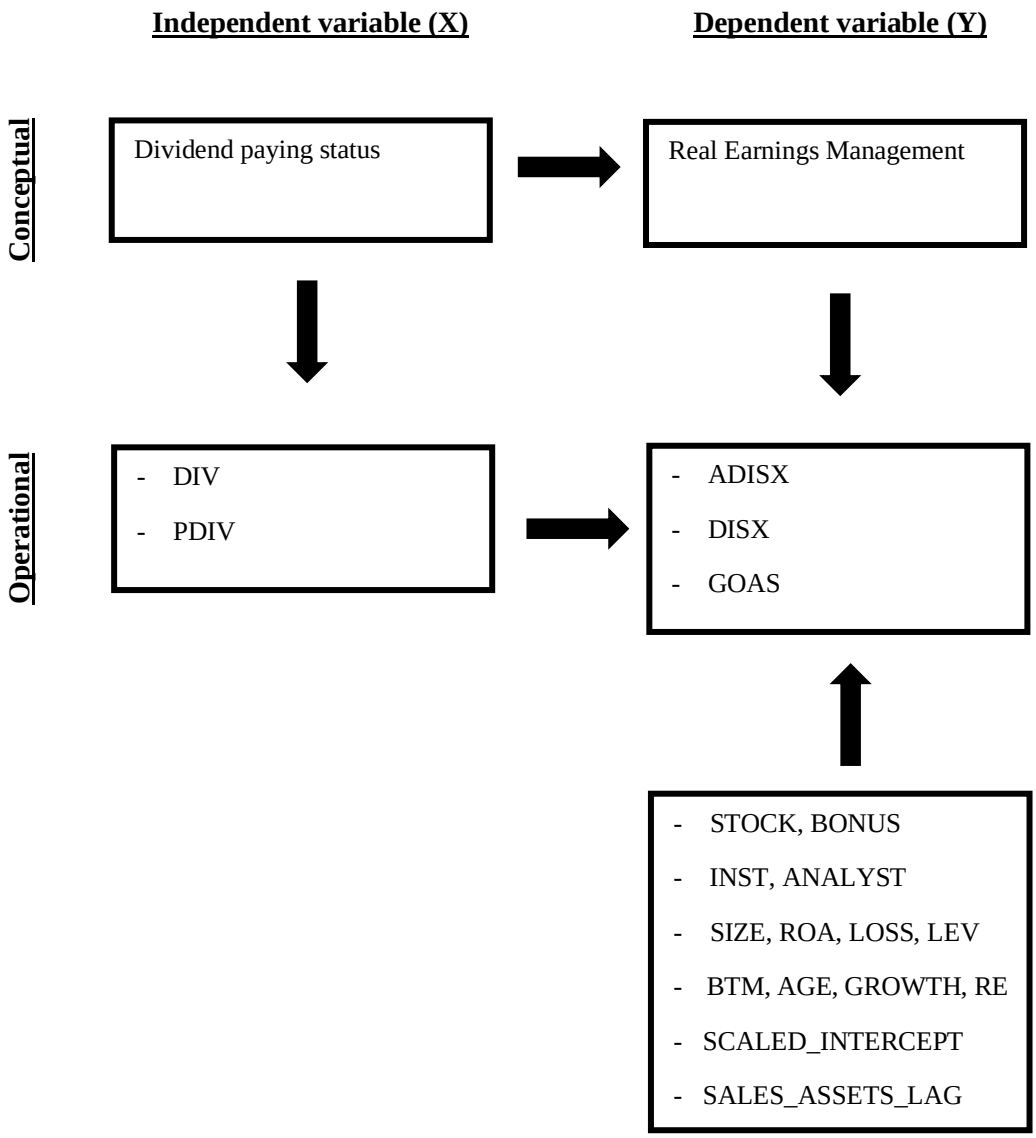

**Figure 2: Libby boxes hypothesis 2**

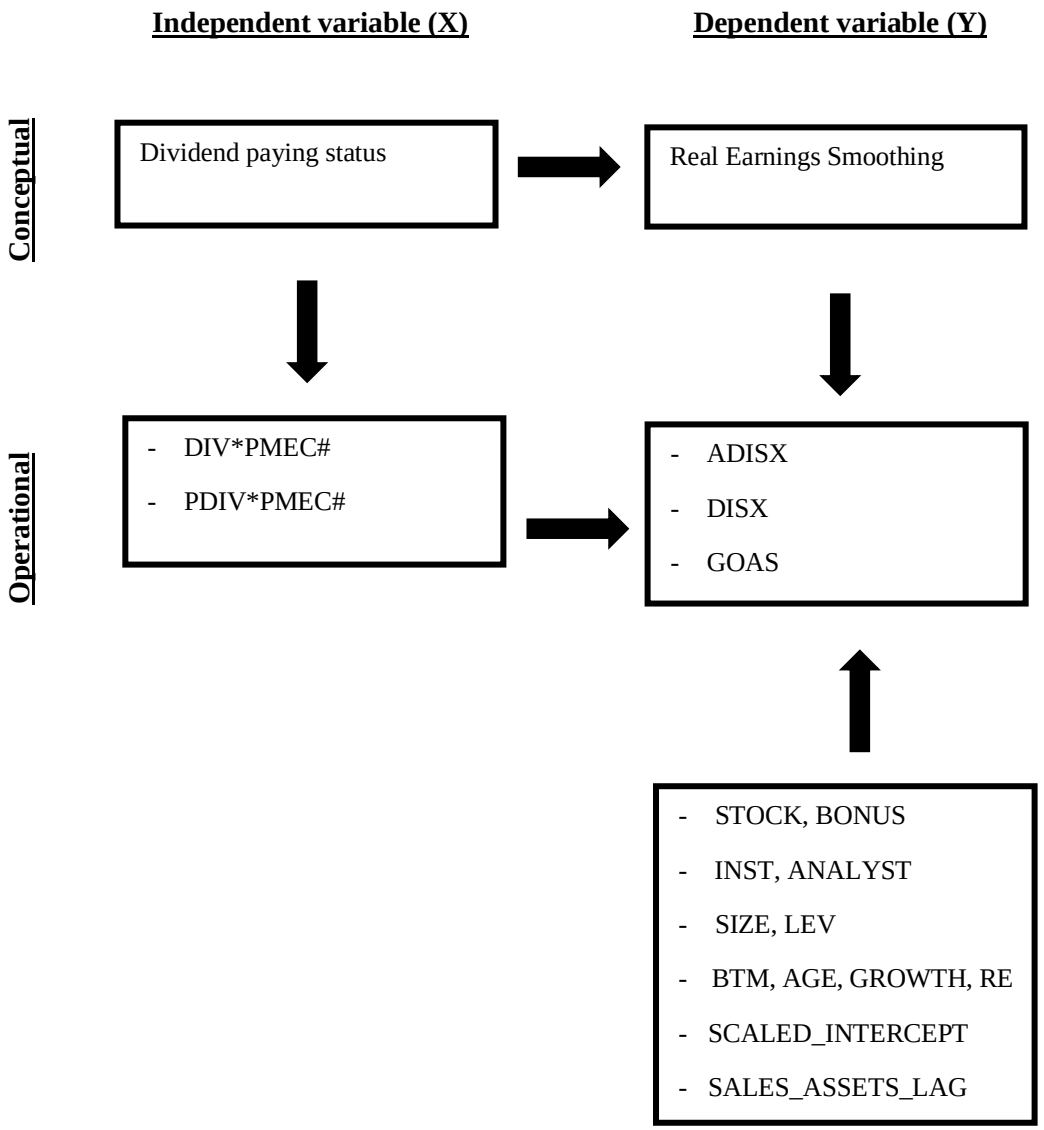

**Figure 3: Libby boxes hypothesis 3**

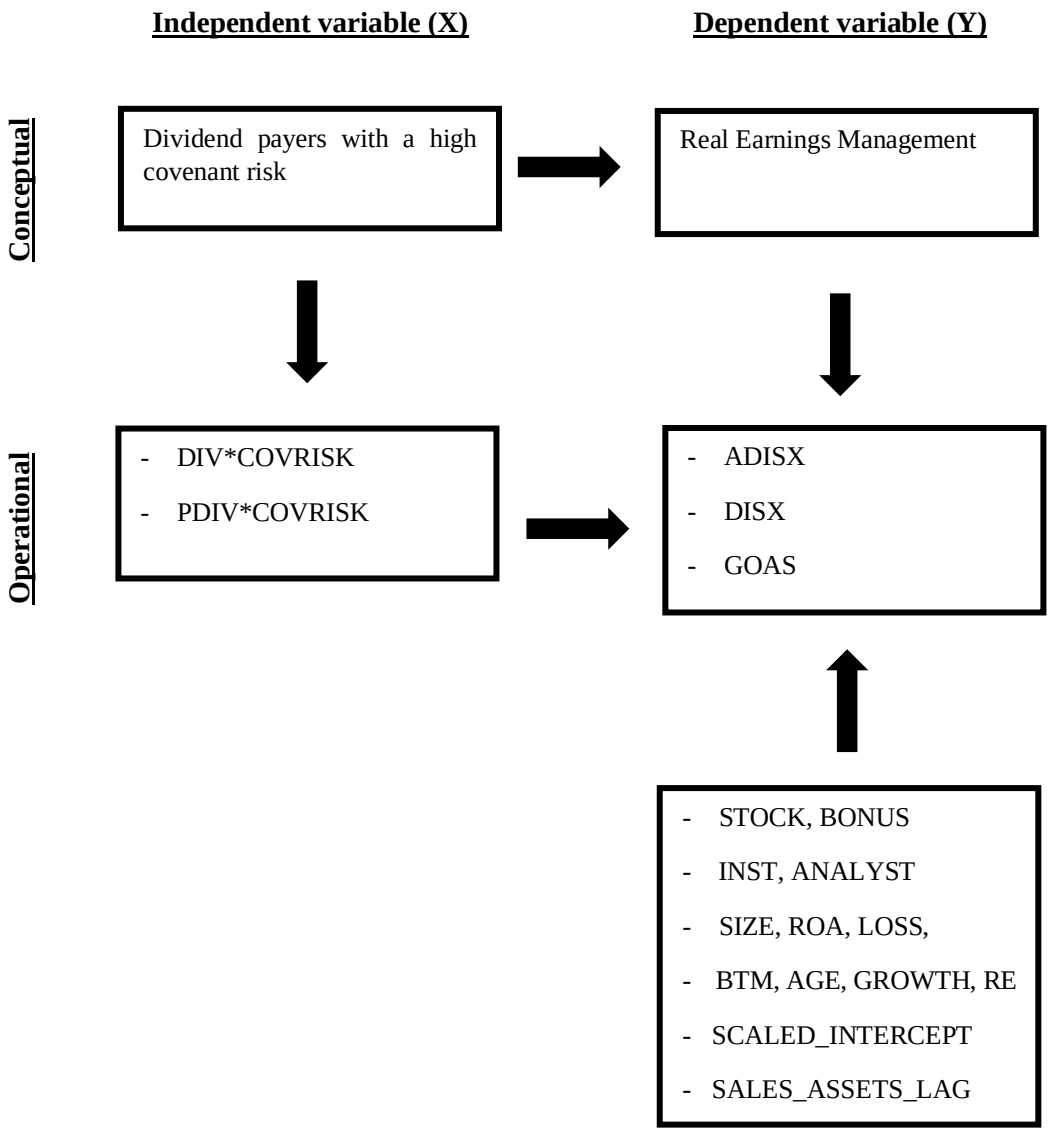

**Figure 4: Interaction effect – Hypothesis 2 (ADISX)**

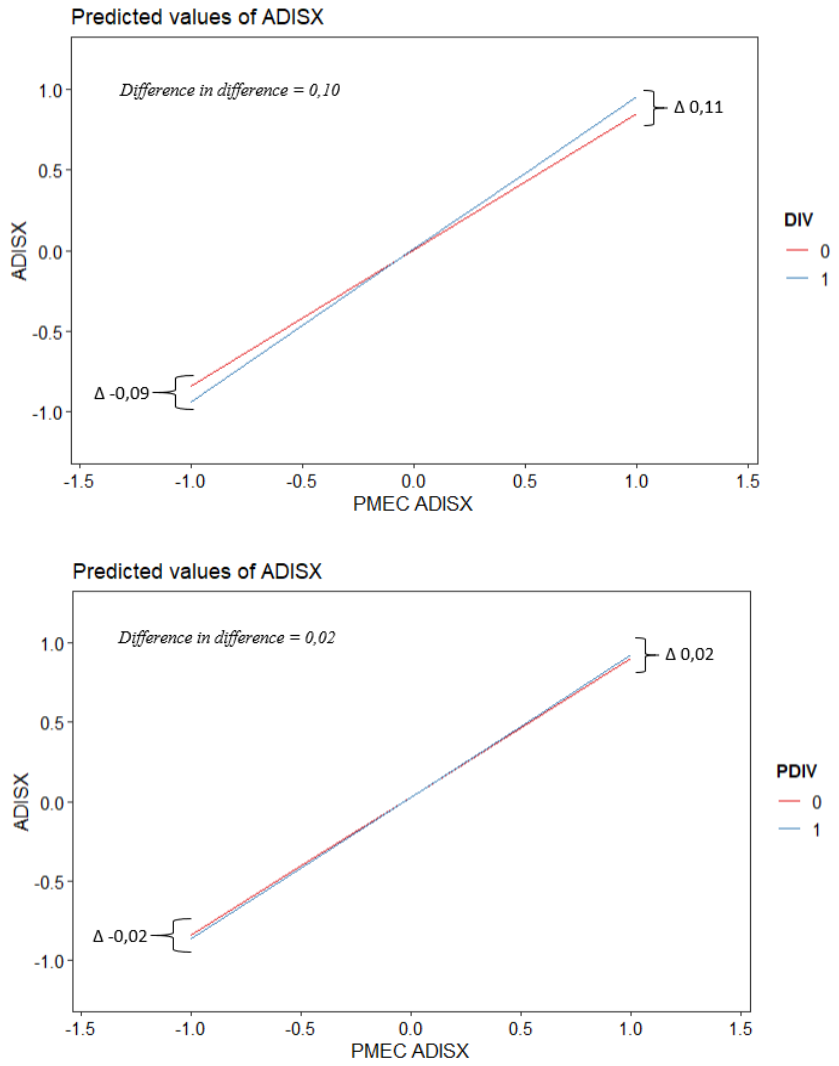

**Figure 5: Interaction effect – Hypothesis 2 (DISX)**

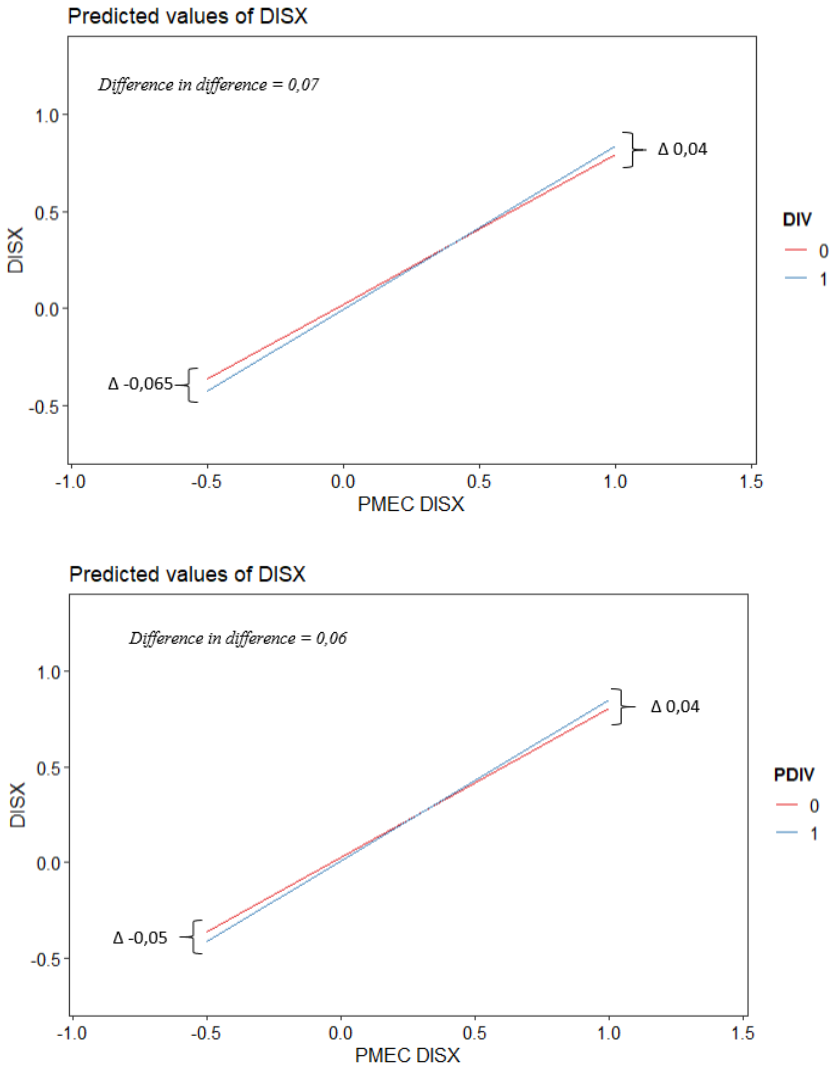

**Figure 6: Interaction effect – Hypothesis 2 (ASSETSALES)**

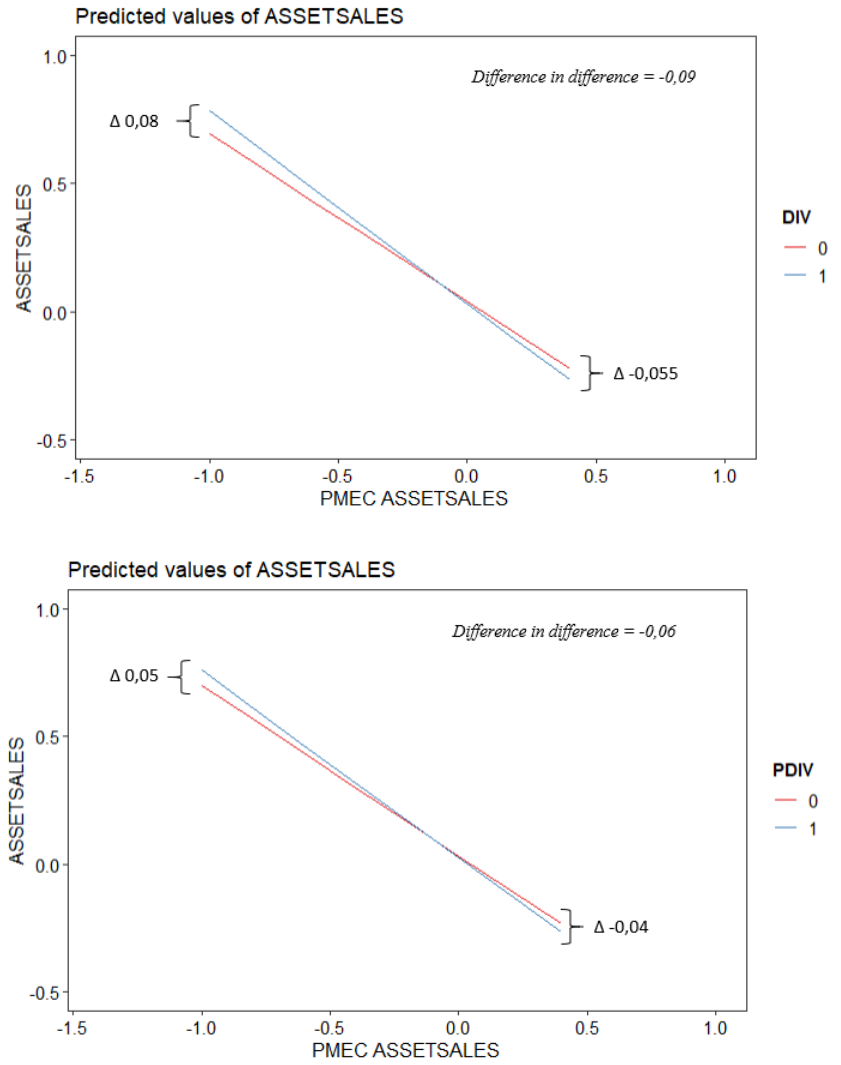

**Figure 7: Interaction effect – Hypothesis 3 (ADISX)**

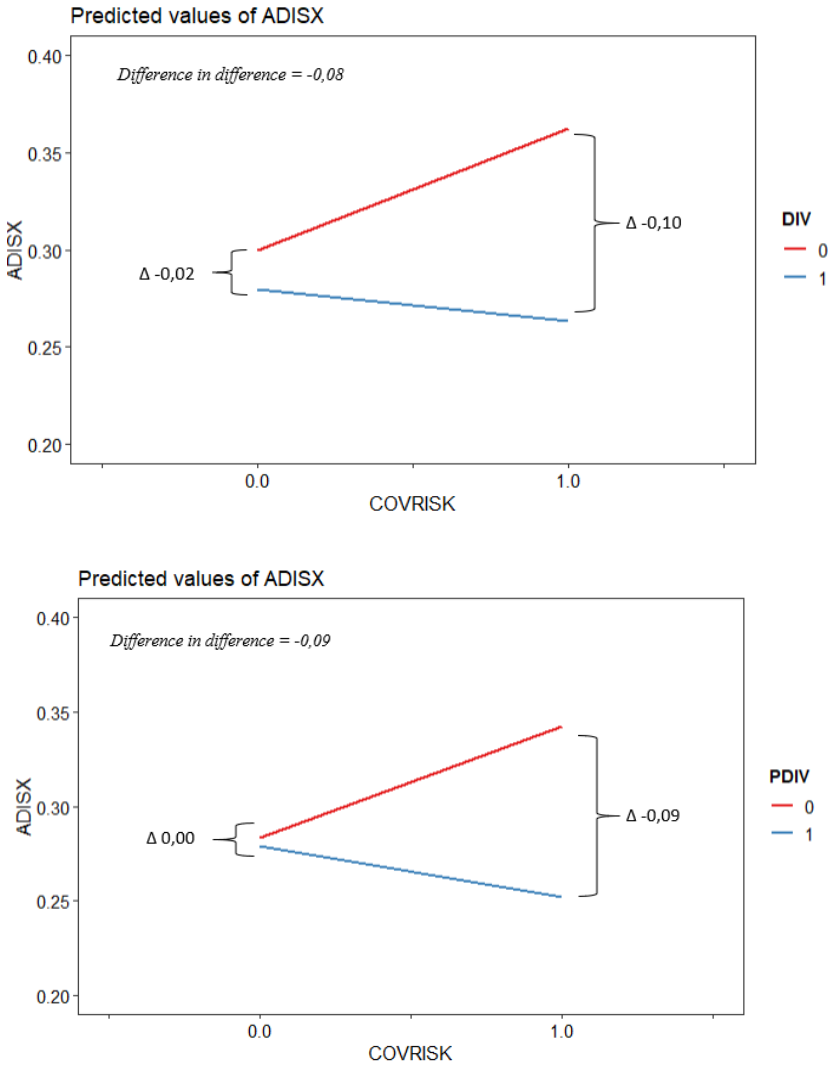

**Figure 8: Interaction effect – Hypothesis 3 (DISX)**

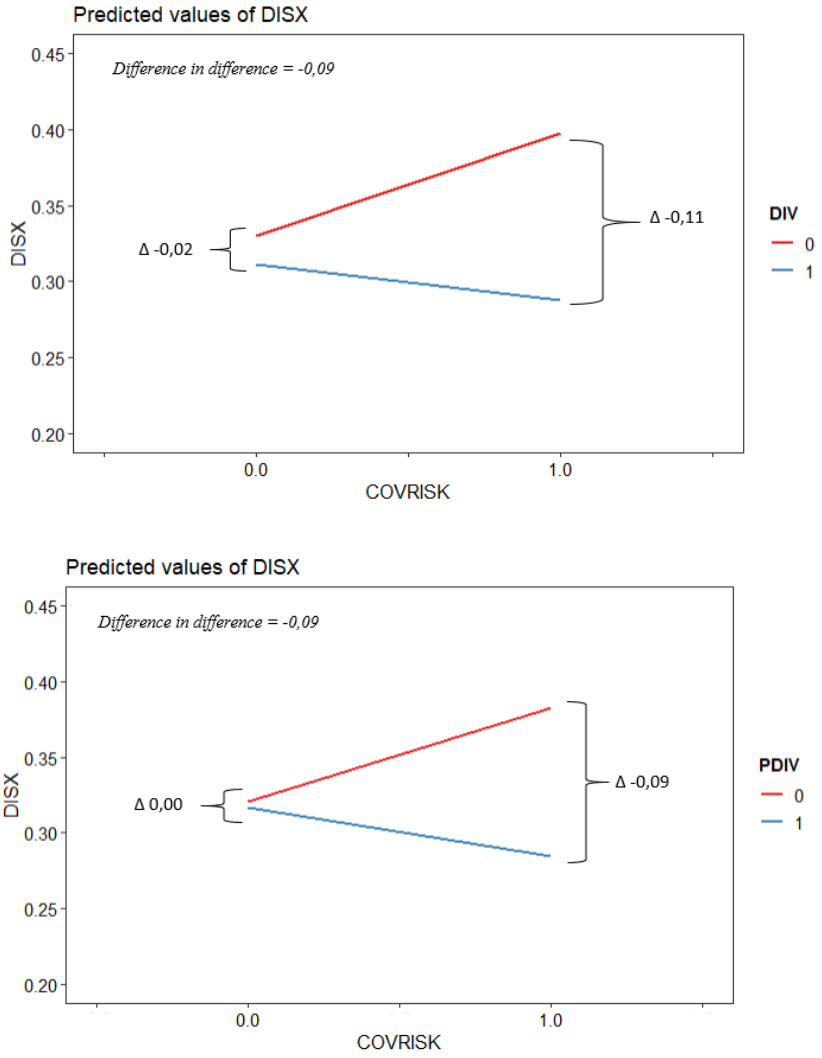

**Figure 9: Interaction effect – Hypothesis 3 (ASSETSALES)**