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Bachelor thesis

2018 **Andrey Britskiy**

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The Effect of Litigation Risk on Earnings Management in the Proximity to Debt Covenant Violation

Bachelor thesis

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Abstract

This bachelor thesis aims to establish a relationship between earnings management in proximity to debt covenant violation and the presence of litigation risk. Central testable concept is Watts and Zimmerman (1990) debt covenant hypothesis according to which managers tend to manipulate earnings to reduce the possibility of violation of their company's debt agreement. This setting allows investigating whether the risk of litigation is an effective regulatory mechanism which improves the contracting usefulness of accounting numbers and better align the interests between creditors and company managers, thus making debt covenants more reliable as monitoring mechanisms. Due to inconclusive results, this thesis was unable to establish whether the threat of litigation can discipline managerial reporting practices and deter misreporting for the companies with substantial debt covenant incentives.

Keywords

Earnings Management, Revenue management, Discretionary revenues, Litigation Risk, Debt covenant violation, Technical default

Range of thesis: 61303 characters

Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

2. The author hereby declares that all the sources and literature used have been properly cited.

3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague 31. 07. 2018 **Andrey Britskiy**

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Institute of Economic Studies
Bachelor thesis proposal

Proposed topic:

The Effect of Litigation Risk on Earnings Management in the Proximity to Debt Covenant Violation

Preliminary scope of work:

Research question and motivation

Bank loan agreements include covenants to mitigate agency costs faced by the lender. Technical default gives lenders the option of accelerating the loan repayment schedule, restricting the availability of credit, or modifying the cost of capital. According to the covenant-based hypothesis, firms have incentives to meet debt covenants to avoid a technical default. They may use accounting earnings management (AEM), real earnings management (REM) or both to do so. Ultimately, the quality of the financial statements, portraying the economic performance and condition of the companies, is affected by both AEM and REM. It is thus crucial to determine the factors that limit firm's ability to manage earnings, and one of such factors proposed and investigated in the prior research is litigation risk.

Contribution

I will add to the literature on effects of litigation risk on earnings management by examining litigation risk as a factor affecting the relation between proximity to debt covenant violation and earnings management. I anticipate litigation risk to have a restricting effect on the overall (total) level of earnings management (TEM) for firms close to a violation or in technical default of their debt covenants. Consistent with previous research on relation between proximity to debt covenant violation and earnings management I also expect a trade-off between REM and AEM to avoid violation of debt covenants in the presence of litigation risk

Hypotheses

1. Litigation risk reduces total earnings management for firms with substantial debt covenant incentives
2. Firms close to a violation or in technical default of their debt covenant are less likely to engage in upward accounting earnings management in the presence of litigation risk.

3. Firms close to a violation or in technical default of their debt covenant are more likely to engage in real earnings management in the presence of litigation risk.

Methodology

Following Chung et. al. (2013) I will use abnormal Directors & Officers (D&O) liability insurance coverage limits to measure expected litigation risk.

I will follow procedure by Roychowdhury (2006) to model abnormal discretionary expenses, abnormal production costs and abnormal cash flow from operations and measure REM as the sum of these three components

To measure AEM, I will follow the procedure in Kothari et. al. (2005). First, I will estimate modified Jones (1991) model discretionary accrual. Then I will match each firm in the experimental sample based on two-digit SIC code, year and closest return on assets, thus extending and adjusting modified Jones model for performance through performance matching.

To evaluate overall changes in earnings management (TEM), I will combine a measure of REM with a measure of AEM.

I will then proceed with hypotheses testing and evaluation of results.

Outline

1. Introduction
2. Related literature and empirical predictions
3. Research design, sample and data
4. Data analysis and empirical results
5. Summary and conclusions

List of academic literature:

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Contents

1. Introduction

Financial debt covenants are accounting-based limits such as restrictions on a company's leverage, interest coverage, total fixed charges, or net worth. These restrictions are set by the company's lenders to cut the cost of monitoring. These debt-covenants also assuage the lenders' fear that the managers might exploit their informational advantage to pursue strategies that are not in the best interest of the lenders but are in the best interest of the managers and the shareholders (Garleanu and Zwiebel, 2009). By design, these debt-covenants are set to function as "trip-wires". Should the debtor trip, the lenders can easily tighten their grip before it is too late.

A violation of a debt covenant is defined as any breach of a covenant of an indenture or agreement that exists at the balance sheet date (Nini et al., 2011). Violation of debt covenant (i.e. a technical default) gives the creditor the option of accelerating the loan repayment schedule, restricting the availability of credit, or modifying the cost of capital (Sufi, 2006). It also results in significant declines in future capital investments in the company (Chava and Roberts, 2007). These consequences indicate that technical default is costly to the companies. Therefore, as with other costly activities, companies have incentives to avoid debt covenant violations. Hence, to delay the onset of default or to improve their bargaining position in the event of debt renegotiation managers engage earnings manipulations in the periods prior to or concurrent with technical default (DeFond and Jiambalvo, 1994; Dichev and Skinner, 2001).

Another incentive to manage earnings around a debt-covenant violation originates from the manager's compensation contract (Jha, 2013). This contract is designed to have the lowest possible agency cost and to address the conflict between the bondholders and the shareholders. Usually, the firm first chooses the optimal compensation contract based on accounting numbers to minimise agency costs arising from the separation of ownership (shareholders) and control (managers).

What makes the earnings management around the debt-covenants the interesting question is that the managers have some discretion on how to report their earnings. They have such discretion partly because it is impossible to write a contract that

eliminates it, and partly because it might be optimal for shareholders to allow managers some discretion (Demski et al., 1984). As a consequence, managers manage earnings. The reasons for the earnings management can be many, but often the reasons are opportunistic. Although earnings management can be in the best interest of the short-term shareholders, it is usually not in the best interest of the long-term shareholders because the earnings management erodes the firm's long-term value (Hazen, 1991). One of the instances where managers are thought to manage earnings upward is to avoid a debt-covenant violation because the violation reflects poorly on the competence of the senior management and is, to some extent, associated with the removal of top management. In the accounting literature, this process of upward earnings management to avoid a violation is defined as the "debt-covenant hypothesis" (DeFond and Jiambalvo, 1994). However, managing earnings upwards before a violation might not always be the best decision. Sometimes, the optimal decision for the managers might be to manage their earnings downwards in the period before a violation. For example, when the managers know that it is impossible to stave off a violation, they might do so. They could also manage earnings strategically in a pre-violation period—either upwards or downwards, depending on whether they expect a waiver of the violation or a renegotiation of the debt covenant soon after the violation.

One type of earnings manipulations is accounting earnings management (hereafter AEM), which involves the use of accounting choices such as accruals. According to Dechow et al. (1995), accruals arise from the mismatch in timing of cash and economic transactions and can help managers convey value-relevant information about the company. Given the discretion allowed in accounting for accruals, managers can also use accruals to manipulate reported earnings (Jones, 1991). Such discretion and potential for manipulation imply that it tends to be difficult for investors to extract the information content embedded in reported accruals. A different kind of earnings management involves changes in real operational or investment activities, real earnings management (hereafter REM). These changes represent deviations from otherwise optimal business decisions to meet certain earnings thresholds earnings (Roychowdhury, 2006). This type of earnings management is perceived as more opaque and harder to detect, in part because of the intrinsic information asymmetry about real operations between a firm's managers and its external stakeholders (Cohen and Zarowin, 2010). Examples of this type of earnings management include boosting sales

through accelerating their timing and/or generating additional unsustainable sales through more lenient credit terms or increased price discounts and, thus, increasing the current period net income; reporting of lower cost of goods sold through increased production to increase current period operating margin; decreases in discretionary expenditures including advertising, R&D, and SG&A expenses to reduce operating expense, boost current period NI and, possibly, current period CFO (Cohen and Zarowin, 2010).

Prior studies indicated the general tendency for companies to rely less on AEM and more on REM for accomplishing their earnings management objectives (Graham et al. 2004; Franz et al. 2014). This preference can be explained can be explained by the benefits presented by REM compared to AEM. While AEM has the advantage of timing flexibility: accruals can be manipulated on the last day of the period; it has no direct impact on cash flows of the company. REM, on the other hand, can help the company to generate cash to meet its unexpected critical needs. An example of such an event would be a significant cut back on R&D to meet debt obligations. Lastly, AEM has a reversal over time constraint which obliges managers to take into consideration the implication of their discretion on current accruals for future earnings. On the other hand, REM is less subject to this constraint.

The most common methods of estimating earnings manipulations use either AEM, REM or the aggregate of both. However, several papers have recommended focussing on one component of earnings, which has the potential to provide more precise estimates of discretion (reference). Evidence suggests that revenue manipulation is one of the major forms of earnings management. For example, according to Dechow and Schrand (2004) over two-thirds of SEC Accounting and Auditing Enforcement Releases they analyzed indicate revenue overstatement, implying that revenue manipulation is extremely common. However, the research examining the determinants of revenue manipulation is extremely limited.

As investors believe that information related to revenue is value relevant and important some industries, such as the internet, have strong incentives for revenue manipulation as reported by Bowen et al. (2002). Stubben (2006) discovered that growth firms are more prone to exercising discretion to manipulate revenues. His results

suggest that companies discretionary revenues as a tool of revenue manipulation to exceed market expectations.

The contribution of this thesis to the earnings management literature is the following. First, I examine debt covenant violation as an incentive for a specific method of earnings management, namely, revenue manipulation and would thus try to shed more light on the high frequency of revenue manipulation documented both anecdotally and empirically. Second, this thesis adds to the existing literature by examining litigation risk as a factor that could limit the availability of accounting flexibility and, thus, reduce earnings management for companies with substantial debt covenant incentives.

Hopkins (2017) provides evidence that higher litigation risk reduces the risk of opportunistic managerial biases in accounting income numbers. This is especially important for debt contracting purposes because, as discussed earlier, the prior literature shows that managers use accounting discretion opportunistically to avoid debt covenant violations (DeFond and Jiambalvo 1994; Dichev and Skinner 2001). Such behaviour weakens the purpose of covenants in debt contracts as the accounting signals that covenants rely on may not be able to inform the creditors of the underlying health of their borrowers. Hence, if the rise in risk of litigation constrains managers' opportunistic accounting discretion in financial statements, then it better aligns the interests between creditors and company managers, thus making debt covenants more reliable as monitoring mechanisms.

De la Bruslerie and Le Maux (2016) argue that litigation can find its source outside of the conflict with shareholders and the domain of security litigation, which is generally accepted to define litigation risk (Skinner, 1994; Hopkins, 2017). They argue that litigation risk may also stem from the firm's policies and in its management's operational or strategic decisions and, thus, they define the litigation risk as "the legal or contractual costs linked to any kind of disputes with any kind of stakeholder". Security class action litigation enables shareholders to sue a company for issuing misleading financial reports and/or disclosures. The direct costs of litigation are substantial - on average about two-thirds of inflicted harm - and are sensitive to the level of damages (Shavell and Polinsky, 2012). In addition to the direct costs of out-of-

court settlements and damages imposed by courts, the market value of the sued company often declines because litigation heightens uncertainty, and causes the market to question management quality and companies' health. A $20 million lawsuit against a firm can prevent it from raising $100 million in debt or equity to finance its activities. It is of note that companies bear the indirect costs of litigation even when the lawsuits are eventually dismissed. For example, the case against General Motors alleging overproduction and channel-stuffing of inventory was ultimately dismissed but dragged on for three years, absorbing managers' attention, their time and expensive legal resources. GM's stock price declined over 30% as the market learned about the inventory issues (General Motors Class Action, 2012). The above can be considered as incentives to avoid litigation. Hence, litigation risk is expected to promote greater accounting quality.

Since class action litigation typically targets managers issuing misleading reports and disclosures one can expect managers of companies with high litigation risk to engage more extensively in REM. This is consistent with the evidence in Cohen et al. (2007) showing that in response to increased litigation risk after the passage of SOX managers switched from accruals to REM.

From the above discussion one can see that while proximity to debt covenant violation encourages earnings manipulation, the high threat of litigation, on the other hand, deters it. Hence, the research question is: Does litigation risk reduce earnings management for companies with substantial debt covenant incentives?

The results of the current thesis indicate that companies in technical default engage in higher levels of revenue manipulation compared to non-violation companies. This result is consistent with previous research. (Holthausen and Leftwich, 1983; Sweeney, 1994; Jha, 2013; Franz et al., 2014). However, this thesis was unable to establish whether the threat of litigation can discipline managerial reporting practices and deter misreporting for the companies with substantial debt covenant incentives.

This thesis is organised in the following way. In Section 2 the prior research is reviewed, and the motivation behind this thesis is explained. Section 3 provides information about the methodology applied and description of the selection of data

sample. Section 4 reports the empirical findings of the thesis and Section 5 concludes and presents areas for further studies based on the empirical results.

2. Related literature and hypothesis development

2.1 Earnings management and debt covenants

Mulford & Comiskey (2002) define debt covenants as provisions in credit or debt agreements that call for the maintenance of specific amounts and relationships. A positive covenant might require the company to maintain an adequate level of shareholder's equity or a minimum ratio of current assets to current liabilities. A negative, or restrictive, covenant could require the company to cease or limit the level of certain operations, for example, to restrict capital expenditures. Such covenants increase the loan repayment rate, as they provide the lender with some degree of control allowing to maintain scrutiny over the performance of the borrower Smith (1993).

Smith (1993) finds that the lenders generally set debt constraints just below the actual current value. Thus, if the company's performance does not deteriorate from the standard industry level, the debt is serviced as usual. However, in case the company's performance declines, covenants are violated, giving the lender the ability to renegotiate the loan. Smith (1993) points out that it is a general practice to reset the constraint to just below the current level, which allows the lender to maintains his ability to quickly step in if performance continues to decline. If the company's performance improves, the debt is serviced as usual. Still, if performance continues to decline, the lender again reassesses the loan, and may eventually get to the point where more drastic alternatives are necessary.

Gopalakrishnan (1994) specifies the following possible debt covenants: Maintenance of minimum working capital, tangible net worth, profitability, quick ratio etc; Restrictions on investments and acquisitions, pledging certain assets; Restrictions on incurring additional indebtedness; Restrictions on incurring other capital expenditures; Restrictions on the ability of the firm to encumber its assets or engage in certain transactions outside the ordinary course of business.

There is substantial evidence that debt covenant violation firms potentially face a variety of financial penalties, such as possible acceleration of debt maturity, increase in interest rate, renegotiation of debt terms. For example, Beneish and Press (1995) document a negative stock price reaction to the announcement of technical default. Core and Schrand (1999) find that companies that are close to violating debt covenants experience a greater adverse stock price reaction to bad news than do companies that are not close to violating covenants. These studies provide evidence that violation of debt covenants is costly to companies.

The debt covenants hypothesis developed by Watts and Zimmermann (1990), is the major presumption tested by researchers subsequently studying the impact of debt covenants on earnings manipulations. Under this hypothesis, managers tend to manipulate earnings to reduce the possibility of violation of their company's debt agreement. The strength of these incentives depends on the costs of violating the firm's debt covenants, that is, on the costs of technical default (Holthausen and Leftwich, 1983).

According to Watts and Zimmerman (1990), there is the considerable influence of tightness of the covenant constraint on the probability of a covenant violation and of incurring costs from technical default. Watts and Zimmerman (1990) believed that managers relax debt constrains and reduce the costs of debt covenant violation by engaging income increasing earnings manipulations. This hypothesis has been subject to the considerable amount of empirical research. Prior research by Sweeney (1994) finds evidence that managers take actions to avoid debt covenant violations. Roychowdhury (2006) finds that real earnings management is higher for companies with debt than those without it and Franz et al. (2014) documented that companies close to debt covenant violation exhibit higher REM compared to far from violation ones. Additionally, research by Kim et al. (2010) established that level of REM is higher for companies when debt covenant slack is tighter.

On the other hand, there is the evidence that managers of financially distressed firms are not likely to inflate earnings and portray firms as less troubled to avoid debt covenant violations (DeAngelo et al., 1994; Darrough et al., 1998). Even though such accounting policies contradict with common sense at first glance, the researchers

provide reasonable explanations for the results obtained. For instance, DeAngelo et al. (1994) found that managers of financially distressed companies use negative AEM to supress the reported earnings even further.

One of the reasons for the controversial evidence is that, in addition to using discretionary accruals, companies may also alter their operating and investing decisions to achieve earnings objectives. Roychowdhury (2006) finds evidence consistent with managers manipulating real activities to avoid reporting losses, and these activities are more prevalent for firms with outstanding debt. On the other hand, he neither directly investigates real earnings management when companies are close to debt covenant violation, nor controls for accrual manipulations. Testing for REM, while controlling for AEM, is vital because managers could use REM to complement or to substitute their use of AEM. Graham et al.'s (2005) survey report that managers often prefer REM over AEM to manage earnings. Cohen and Zarowin (2010) argue that REM is perceived as more opaque and harder to detect, in part because of the intrinsic information asymmetry about real operations between a firm's managers and its external stakeholders. Furthermore, decisions related to REM occur before decisions related to AEM (Zang, 2012). Thus, managers may not be able to reach their earnings management objectives using only AEM. This is consistent with the evidence in Franz et al. (2013) showing that companies close to a violation of their debt covenants or in technical default exhibit higher levels of REM, AEM and total earnings management than far from violation companies.

While there exists extensive literature of AEM and REM around debt covenant violation, no other researcher has studied explicitly if debt covenant violation acts as an incentive for revenue manipulation. I address this issue by testing whether in fear of being subject to fines and penalties for non-compliance with debt covenants specified in loan agreements, managers of the borrowing firms tend to manipulate revenues. My first hypothesis is as follows:

Hypothesis 1: Firms close to or in debt covenant violation engage in upward revenue management

2.2 Litigation risk

The concept of litigation risk has been studied in the fields of law and finance. When considering the litigation risk, Francis et al. (1994), refer to the likelihood that the company's shareholders will sue it over issues related to financial reporting. According to Bhagat and Romano (2005), owners of the companies may ask the judicial system to sanction companies and executives for disseminating financial information that does not faithfully represent the company's wealth.

Francis et al. (1994) examine companies' communication policies, about their exposure to litigation risk. They show that companies in sectors exposed to a high litigation risk - such as technology, retailing, electronics, and computers - delay the announcement of poor financial results, rather than announce them ahead of time.

Litigation risk has been analysed by looking at shareholders' situation within an initial public offering (IPO) framework. According to the litigation risk hypothesis, in order to avoid lawsuits IPO companies underprice their new issues. Evidence evidence shows that 6% of IPO companies were sued in class action in the period 1988-1995 (Lowry and Shu, 2002). Such pursuits lead to essential settlements, averaging 10% of the IPO proceeds. In addition to the direct costs of out-of-court settlements and damages imposed by courts, companies had to bear indirect litigation costs, such as damaged reputations. According to the authors, companies with a higher litigation risk underprice their IPOs by a more considerable amount as a form of insurance, and that larger underpricing lowers expected litigation costs.

In the case of voluntary disclosures and financial reporting, litigation risk has been shown to be a powerful disciplining force in addition to governance (Skinner 1994; Venkataraman et al. 2008; Hopkins 2017). Venkataraman et al. (2008) find that audit fees are higher and accruals are lower during the pre-IPO period when issuers face strict liability. However, the authors did not reveal how managers respond to litigation risk, especially after an IPO.

On the other hand, several studies document that managers respond to litigation risk by altering the occurrence, precision, timing and frequency of earnings forecasts (Skinner, 1994; Skinner, 1997). However, earnings forecasts are not audited, are not likely to be contracted upon, and are generally verified days or weeks later.

Hopkins (2017) further examines the effect of litigation risk on accounting choices reflected in mandatory financial reports. He finds that with the decline of litigation risk companies exhibit increased restatement frequency and higher accruals management, which is consistent with litigation risk deterring managers from misstating financial statements.

However, Hopkins (2017) studied only the perceived benefits of litigation, and his paper does not demonstrate that litigation is an efficient regulatory mechanism. To address this issue, I test whether litigation risk limits managers ability to exercise discretion to relax debt constraints or reduce the costs of technical default. I expect litigation risk to improve the contracting usefulness of accounting numbers and better align the interests between creditors and company managers, thus making debt covenants more reliable as monitoring mechanisms. I hypothesise (in the alternative form):

Hypothesis 2: Litigation risk reduces revenue manipulation for firms with substantial debt covenant incentives

3. Research Design and sample selection

3.1. Methodology

Initially, there is a need for estimating discretionary revenues which is performed using Stubben (2010) model estimated cross-sectionally based on two-digit SIC codes using quarterly data, which controls for industrywide changes in economic conditions that affect earnings management while allowing the coefficients to vary over time (DeFond and Jiambalvo, 1994). Afterwards, to test whether litigation risk affects earnings management around debt covenant violation the estimate of discretionary

revenues is regressed against the measure for litigation risk and a set of control variables.

3.1.1 Discretionary revenues

The first step of the analysis derives discretionary revenues. Discretionary revenues method is the most broadly accepted method for measurement of revenue manipulations in the previous researches. The basic procedure of the method is to use regression analysis to identify what the level of accounts receivables would be if the manager were not committing any manipulations and any differences from that expected level are potentially evidence of revenue manipulations.

This model has been devised by McNichols and Stubben (2008) and Stubben (2010). The model provides advantages over other discretionary accrual models because discretionary revenues show fewer measurement errors, and revenue manipulation is the most common form of earnings management (McNichols 2008; Stubben 2010).

To estimate discretionary revenues this thesis follows the procedure in McNichols and Stubben (2008) and Stubben (2010). In line with prior research all variables are scaled with average total assets to reduce the heteroscedasticity of residuals. Hence, abnormal discretionary revenues (ABREV) are estimated as residuals of the following model:

$$\Delta AR_{i,q} / A_{i,q} = \beta_0 + \beta_1 * [1 / A_{i,q}] + \beta_2 * [\Delta R_{i,q} / A_{i,q}] + \varepsilon_{i,q}$$

Where

$\Delta AR_{i,q}$ = change in accounts receivable for a firm i between quarters *q-1* and *q*;

$A_{i,q}$ = average total assets for a firm *i* from the beginning (q-1) and end of the quarter *q*;

$\Delta R_{i,q}$ = change in sales revenue for a firm i between quarters q-1 and q;

$\varepsilon_{i,q}$ = discretionary revenues for firm i at the end of quarter q.

Following Call et al. (2014), for convenience reasons, the absolute value of abnormal discretionary revenues multiplied by 100 is taken so that the higher amount of ABREV would indicate higher amounts of discretionary revenues.

3.1.2 Litigation risk

To study the impact of litigation risk on misreporting, I follow Hopkins (2017) and examine changes in discretionary revenues following an exogenous shock to the severity of securities class action litigation standards in the U.S. Ninth Circuit Court District. The court ruling in Re: Silicon Graphics Inc. Securities Litigation (SGI) issued on July 2, 1999, by the U.S. Ninth Circuit Court of Appeals requires plaintiffs to prove that defendants acted with "deliberate recklessness". This decision substantially increased the hurdle for successful litigation against corporations headquartered in this circuit and reduced their litigation risk (Pritchard and Sale, 2005). As the shock affected only companies situated in U.S. Ninth Circuit Court District, I can compare their post-ruling changes in discretionary revenues to those of companies situated in states belonging to other circuits in differences-in-differences regression.

My empirical analysis compares the companies headquartered in the U.S. and listed on the U.S. stock market in window of three years before (1996-1998) and after (2000-2002) the court ruling in Re: Silicon Graphics Inc. Securities Litigation (SGI) issued on July 2, 1999, by the U.S. Ninth Circuit Court of Appeals. The year of the ruling, 1999, is excluded from the analysis. The sample restriction allows preventing possible misinterpretation arising from differences in reporting standards as all the companies in the sample are assumed to report under US GAAP. The time-frame restriction allows me to avoid the possible effect of confounding events over longer horizons. For example, it excludes any effect following the passage of the Sarbanes Oxley Act in 2002.

3.1.3 Effects of litigation risk (Empirical model)

The last step of analysis strives to achieve the purpose of the study. To investigate the impact of litigation risk on misreporting around a covenant violation, I estimate the following quarterly OLS model:

$$\mathbf{ABREV_{i,q} = \beta_0 + \beta_1 Circuit9_i + \beta_2 Post_q + \delta_0 Circuit9_i * Post_q + \beta_3 Viol_{i,q} + \beta_4 Circuit9_i * Viol_{i,q} + \beta_5 Post_q * Viol_{i,q} + \delta_1 Circuit9_i * Post_q * Viol_{i,q} + \beta_6 LEV_{i,q-1} + \beta_6 ROA_{i,q-1} + \beta_7 LnA_{i,q-1} + \beta_6 MTB_{i,q-1} + \varepsilon_{i,q}}$$

Where

$ABREV_{i,q}$ = abnormal discretionary revenues for firm i at the end of quarter q;

$Circuit9_i$ = dummy variable that equals to one if firm i is headquartered in one of the Ninth Circuit states and zero otherwise;

$Post_q$ = dummy variable that equals to one if firm issued the quarterly report after Ninth Circuit ruling (from 2000 to 2002) and zero otherwise (from 1996 to 1998);

$Viol_{i,q}$ = dummy variable that equals to one in the quarter in which a violation occurs and zero otherwise.

$LEV_{i,q-1}$ = long-term debt to total assets for a firm i at the beginning of quarter q;

$ROA_{i,q-1}$ = returns on assets for a firm i at the beginning of quarter q;

$LnA_{i,q-1}$ = natural logarithm of total assets for a firm i at the beginning of quarter q;

$MTB_{i,q-1}$ = market-to-book ratio for a firm i at the beginning of quarter q;

The coefficients of interest are δ_0, β_3, δ_1. β_3 indicates whether debt covenant violation affects revenue manipulation. δ_0 and δ_1 measure how the decline in litigation risk with Ninth Circuit ruling for Ninth Circuit companies affected revenue manipulation relative to other companies in general and in the quarters with violation respectively. Notably, as U.S. Ninth Circuit Court of Appeals ruling issued on July,1999 (Post) reduced litigation risk for companies headquartered in Ninth Circuit states (Circuit9) δ_0 is expected to have a positive sign, as fall of litigation risk is anticipated to provide the opportunity for revenue manipulation for those companies.

To control for differences in earnings management incentives, the regression equation includes variables of leverage, firm performance, political attention and capital market incentives. To control for the effects of leverage on earnings management the ratio of long-term debt to total assets (LEV) is included (DeFond and Jiambalvo, 1994; Call et al., 2014). Return on assets (ROA) is used to control for firm performance. To control for political attention (Watts and Zimmerman, 1990) and capital market incentives (Koh, 2003) of misreporting, the model includes variables of size and growth opportunities respectively. The Former is proxied by the natural logarithm of total assets (LnA), which itself is also a proxy for size of the company. The latter is proxied by the market-to-book ratio (MTB).

3.2. Sample Selection

My final sample consists of 63090 firm-quarters and 5337 firms that span from the first quarter of 1996 to the fourth quarter of 2002, excluding 1999. They represent the intersection of nonfinancial and non-utilities firms that have the violation data, the non-missing data to calculate the discretionary revenues, and the non-missing data for the control variables used in the main regression model.

The sample selection is as follows. I start with all nonfinancial and non-utilities firms available on Amir Sufi's website and used in the paper by Nini et al. (2011). This data set provides the calendar date of the quarterly filing and an indicator variable that shows whether the firm reports a violation of a covenant. It is then matched with the Compustat data set to obtain the variables required to calculate the discretionary revenues and control variables. In line with earnings management literature, the final sample was selected in accordance with the following principles: the sample requires that at least 2 observations be available to run industry-quarter regressions; the sample excludes companies in financial industries (sic 6000-6999) and utilities (sic 4000-4999), because these industries are highly regulated, and company managers may have incentives to manage earnings to meet regulatory standards; the sample excludes companies with missing data on any of the required for the analysis variables; Specific to the thesis research, the sample excludes firms that changed states of headquarters. To mitigate the effect of outliers, I winsorize all of the continuous variables at the 1st and the 99th percentile. All variables are explained in Appendix 1.

Notably, all the earnings management incentive control variables included are calculated for the beginning of each quarter to examine their impact to influence managers' incentives to modify earnings subsequently during the quarter. The table below represents descriptive statistics for the variables of the second regression equation:

Table 1. Descriptive statistics of the sample (n=63090)

Variable	Min	Median	Mean	Max	Std. Error	Std. Dev.
ABREV	.0000497	1.317529	2.026896	217.507	.0110913	2.785879
Circuit9	0	0	.2571247	1	.00174	.4370522
Post	0	1	.5278491	1	.0019876	.4992278
Circuit9Post	0	0	.1432715	1	.0013948	.3503523
Viol	0	0	.0684102	1	.0010051	.2524505
Circuit9Viol	0	0	.0186083	1	.1351383	.1351383
PostViol	0	0	.0420669	1	.2007434	.2007434
Circuit9PostViol	0	0	.0112538	1	.105486	.105486
LEV	0	.0748249	.1566407	3.650022	.2044693	.2044693
ROA	-51.09655	.0062074	-.0269196	21.66499	.2780643	.2780643
LnA	-1.237874	4.720047	4.904714	13.22766	1.85668	1.856682
MTB	-1046.875	2.073948	3.314064	3293.539	19.25831	19.25831

Note: Sample consists of 63090 firm-quarters and 5337 firms that span from the first quarter of 1996 to the fourth quarter of 2002, excluding 1999. Only companies headquartered in the U.S. and listed on the U.S. stock market are considered, thus all figures are assumed to be reported under US GAAP. All data (apart form the reported covenant violation) comes from Compustat database. All continuous variables are winsorized at the 1st and the 99th percentile. $ABREV_{i,q}$ abnormal discretionary revenues for firm i at the end of quarter q; $Circuit9_i$ is the dummy variable that equals to one if firm i is headquartered in one of the Ninth Circuit states and zero otherwise; $Post_q$ is the dummy variable that equals to one if firm issued the quarterly report after Ninth Circuit ruling (from 2000 to 2002) and zero otherwise (from 1996 to 1998); $Viol_{i,q}$ is the dummy variable that equals to one in the quarter in which a violation occurs and zero otherwise. $LEV_{i,q-1}$ is the long-term debt to total assets for a firm i at the beginning of quarter q; $ROA_{i,q-1}$ is the returns on assets for a firm i at the beginning of quarter q; $LnA_{i,q-1}$ is the natural logarithm of total assets for a firm i at the beginning of quarter q; $MTB_{i,q-1}$ is the market-to-book ratio for a firm i at the beginning of quarter q.

4. Empirical results

Table 2 provides correlation coefficients among independent variables. The intention behind correlation analysis is to identify possible multicollinearity. Multicollinearity is referred to as a high correlation among the independent variables of the model. According to Anderson et al. (2009), if two independent variables have a sample correlation coefficient exceeding ±0.7, it can be used as an indicator of potential multicollinearity issue.

Table 2. Correlation between independent variables (n=63090)

	Circuit9	Post	C9Post	Viol	C9Viol	PostViol	C9PostViol	LEV	ROA	LnA	MTB
Circuit9	1.00										
Post	0.0346	1.00									
C9Post	0.6951	0.3868	1.00								
Viol	0.0092	0.0473	0.0164	1.00							
C9Viol	0.2341	0.0212	0.1814	0.5081	1.00						
PostViol	0.005	0.1982	0.0743	0.7733	0.386	1.00					
C9PostViol	0.1813	0.1009	0.2609	0.3937	0.7748	0.5091	1.00				
LEV	-0.1066	0.005	-0.0717	0.0464	-0.0144	0.0273	-0.0138	1.00			
ROA	-0.0347	-0.0448	-0.0458	-0.0252	-0.0215	-0.0235	-0.0215	0.0061	1.00		
LnA	-0.071	0.1153	0.0037	-0.0744	-0.0474	-0.0401	-0.0263	0.2724	0.123	1.00	
MTB	0.0145	-0.0124	0.009	-0.0172	-0.0066	-0.0156	-0.0058	-0.0123	-0.002	0.0018	1.00

Note: All continuous variables are winsorized at the 1st and the 99th percentile. $ABREV_{i,q}$ abnormal discretionary revenues for firm i at the end of quarter q; $Circuit9_i$ is the dummy variable that equals to one if firm i is headquartered in one of the Ninth Circuit states and zero otherwise; $Post_q$ is the dummy variable that equals to one if firm issued the quarterly report after Ninth Circuit ruling (from 2000 to 2002) and zero otherwise (from 1996 to 1998); $Viol_{i,q}$ is the dummy variable that equals to one in the quarter in which a violation occurs and zero otherwise. $LEV_{i,q-1}$ is the long-term debt to total assets for a firm i at the beginning of quarter q; $ROA_{i,q-1}$ is the returns on assets for a firm i at the beginning of quarter q; $LnA_{i,q-1}$ is the natural logarithm of total assets for a firm i at the beginning of quarter q; $MTB_{i,q-1}$ is the market-to-book ratio for a firm i at the beginning of quarter q.

When multicollinearity exists, the confidence intervals of the coefficients tend to become very wide, and the statistics tend to be very small, p-values may be misleading, and t-values tend to be too low, leading to lack of significance of independent variables (Anderson et al., 2009). Hence, in the presence of multicollinearity, it may become difficult to reject the null hypothesis. A possible solution to the issue would be to remove highly correlated variables from the regression equation. Multicollinearity is observed between the control variable Circuit9Viol and variable of interest Circuit9PostViol (0.7748) as well as between control variable PostViol and variable of interest Viol (0.7733). To test whether this affects the significance of the variables of interest Viol and Circuit9PostViol the empirical model was run with and without Circuit9Viol and PostViol control variables. The empirical results of the original model are summarised in table 3.

Table 3. Empirical model results (n=63090)

Variable	Coefficient	Standard error
(Intercept)	2.718841**	.0348241
$Circuit9_i$	-.0786266**	.0388251
$Post_q$	.0473657*	.0266274
$Circuit9_iPost_q$	-.0456576	.0525457
$Viol_{i,q}$	.3444655**	.0823727
$Circuit9_iViol_{i,q}$	.4309317**	.1562052
$Post_qViol_{i,q}$	.047259	.1050477
$Circuit9_iPost_qViol_{i,q}$	-.2495949	.2009498
$LEV_{i,q-1}$	.0321769	.0564436
$ROA_{i,q-1}$	-.2668213**	.0400317
$LnA_{i,q-1}$	-.1489784**	.0063015
$MTB_{i,q-1}$	-.0007475	.0005723
R-squared	0.0135	
Adj R-squared	0.0133	

Note: **Table 3** presents a detailed list of empirical model coefficients and their standard errors.** and * denote coefficients significant at 5% and 10% respectively. All continuous variables are winsorized at the 1st and the 99th percentile. $Circuit9_i$ is the dummy variable that equals to one if firm i is headquartered in one of the Ninth Circuit states and zero otherwise; $Post_q$ is the dummy variable that equals to one if firm issued the quarterly report after Ninth Circuit ruling (from 2000 to 2002) and zero otherwise (from 1996 to 1998); $Viol_{i,q}$ is the dummy variable that equals to one in the quarter in which a violation occurs and zero otherwise. $LEV_{i,q-1}$ is the long-term debt to total assets for a firm i at the beginning of quarter q; $ROA_{i,q-1}$ is the returns on assets for a firm i at the beginning of quarter q; $LnA_{i,q-1}$ is the natural logarithm of total assets for a firm i at the beginning of quarter q; $MTB_{i,q-1}$ is the market-to-book ratio for a firm i at the beginning of quarter q.

Table 3 summarizes the results of a regression of discretionary revenues (ABREV) against major influence factors. ABREV are estimated as residuals of McNichols and Stubben (2008) and Stubben (2010) model. Out of three factors of interest (Circuit9Post, Viol and Circuit9PostViol) only Viol appears to be significant (5% level) in explaining DAC. The influence of this factor is positive. Therefore a positive effect of Viol on ABREV was found, which is consistent with Hypothesis 1. The other factors of interest, Circuit9Post and Circuit9PostViol, have no explanatory power over discretionary revenues. Hence, hypotheses that litigation risk reduces revenue manipulation for firms with substantial debt covenant incentives (hypothesis 2) is not accepted due to lack of sufficient evidence in favour of those hypotheses.

Out of four control variables employed in the empirical model only return on assets (ROA) and the natural logarithm of total assets (LnA) were found to be significant (both variables are statistically significant at 5% level) in explaining discretionary revenues. The influence of both factors is negative implying the reverse relationship. Hence, lower return on assets and the lower natural logarithm of total assets at the beginning of the quarter both lead to positive revenue manipulation. The result is consistent with earlier research (see, e.g., Call et al., 2014; Watts and Zimmerman, 1990). For example, LnA proxies for size and political cost and according to political cost hypothesis (Watts and Zimmerman, 1990) larger and more profitable companies attract more attention of the auditors and governmental bodies. Hence, to lower their political risk companies would have to manage revenues downwards.

To investigate whether the high correlation between Circuit9Viol and Circuit9PostViol (0.7748) as well as between PostViol and Viol (0.7733) affects regression results an additional regression was performed without factors Circuit9Viol and PostViol. Regression without factors Viol and Circuit9PostViol was not performed as these are the key interest factors to this thesis. The empirical results of the reduced model are summarised in table 4. The results in table 4 are analogous to those in table 3.

Table 4. Empirical model results excluding Circuit9Viol and PostViol variables (n=63090)

Variable	Coefficient	Standard error
(Intercept)	2.713909**	.0346486
$Circuit9_i$	-.0517526	.0376236
$Post_q$	.0488729*	.0257725
$Circuit9_iPost_q$	-.0698848	.0515782
$Viol_{i,q}$	.4255657**	.0480311
$Circuit9_iPost_qViol_{i,q}$	.147615	.1182866
$LEV_{i,q-1}$	.0301287	.0564364
$ROA_{i,q-1}$	-.2670106**	.040033
$LnA_{i,q-1}$	-.1487733**	.0063014
$MTB_{i,q-1}$	-.0007489	.0005723
R-squared	0.0134	
Adj R-squared	0.0132	

Note: **Table 4** presents a detailed list of empirical model coefficients and their standard errors.** and * denote coefficients significant at 5% and 10% respectively. All continuous variables are winsorized at the 1st and the 99th percentile. $Circuit9_i$ is the dummy variable that equals to one if firm i is headquartered in one of the Ninth Circuit states and zero otherwise; $Post_q$ is the dummy variable that equals to one if firm issued the quarterly report after Ninth Circuit ruling (from 2000 to 2002) and zero otherwise (from 1996 to 1998); $Viol_{i,q}$ is the dummy variable that equals to one in the quarter in which a violation occurs and zero otherwise. $LEV_{i,q-1}$ is the long-term debt to total assets for a firm i at the beginning of quarter q; $ROA_{i,q-1}$ is the returns on assets for a firm i at the beginning of quarter q; $LnA_{i,q-1}$ is the natural logarithm of total assets for a firm i at the beginning of quarter q; $MTB_{i,q-1}$ is the market-to-book ratio for a firm i at the beginning of quarter q.

5. Conclusion

The purpose of this thesis is to investigate whether litigation risk reduces earnings management for companies with substantial debt covenant incentives. According to Watts and Zimmerman (1990), managers tend to manipulate earnings to reduce the possibility of violation of their company's debt agreement. I try to establish whether the risk of litigation is an effective regulatory mechanism which improves the contracting usefulness of accounting numbers and better align the interests between creditors and company managers, thus making debt covenants more reliable as monitoring mechanisms.

A variation of acclaimed Stubben (2010) model is employed in this thesis to capture discretionary revenues which were used as a proxy for earnings management. The underlying reasons for the focus on one component of earnings rather than an aggregate measure were the following: first, it is proven to yield more accurate estimates of discretion (Stubben, 2010; Call et al., 2014); Second, it allows to examine the effect of debt covenant incentives on revenue manipulations, which has not been studied before, and contribute to the investigation of Watts and Zimmerman (1990) debt covenant hypothesis, the empirical findings on which are conflicting.

The data on the company's violations were extracted from Nini et al.'s (2011) publicly available comprehensive quarterly dataset of reported covenant violation. Litigation risk was captured using "natural experiment", the exogenous shock from the U.S. Ninth Circuit Court of Appeals ruling, which has tightened securities class action litigation standards and, thus, reduced litigation risk for companies headquartered in the Ninth Circuit District.

The results of the current thesis suggest that the variable under debt covenants hypothesis which is Viol appear to be significant in explaining discretionary revenues. As expected by the debt covenant hypothesis the relationship is direct. This result is consistent with previous research, which was supported by a reasonable explanation (Holthausen and Leftwich, 1983; Sweeney, 1994; Jha, 2013; Franz et al., 2014). For

instance, Holthausen and Leftwich (1983) argue that the strength of managerial incentives to manipulate earnings depends on the costs of violating the firm's debt covenants, that is, on the costs of technical default. As a violation of debt covenant gives the creditor the option of accelerating the loan repayment schedule, restricting the availability of credit, or modifying the cost of capital (Sufi, 2006), as well as results in significant declines in future capital investments in the company (Chava and Roberts, 2007). Hence, to delay the onset of default or to improve their bargaining position in the event of debt renegotiation managers engage earnings manipulations.

The results of analysis of litigation risk were inconclusive and, thus, I was unable to establish neither whether litigation risk deters revenue manipulation in general nor whether it deters revenue manipulation for the companies with significant debt covenant incentives.

It is possible to extend this study in a number of ways. As some of the empirical results were inconclusive is suggested to employ a different measure of litigation risk to test its effect on earnings manipulation around debt covenant violation. This would lift the time-frame restriction of the current research. It is also advised to control for other earnings management incentives, including, but not limited to: length of the operating cycle, capital intensity, auditors' competence.

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7. Appendices

Appendix 1: Variable Glossary

Variable	Explanation
Circuit9	Indicator equal to one if the firm is headquartered in one of the Ninth Circuit States.
Post	Indicator equal to one for years 2000-2002, and zero for years 1996-1998
Viol	Indicator equals to one for quarters which a violation occurs and zero otherwise;
LEV	Proportion of long-term debt to total assets
ROA	Returns on assets, measured as net income divided by total assets
MTB	Market-to-book ratio
LnA	Natural logarithm of total assets
ABREV	Following McNichols and Stubben (2008) and Stubben (2010), I estimate abnormal discretionary revenues as residuals of the following model: $\Delta AR_{i,q} / A_{i,q} = \beta_0 + \beta_1 * [1 / A_{i,q}] + \beta_2 * [\Delta R_{i,q} / A_{i,q}] + \varepsilon_{i,q}$
ΔAR	Change in accounts receivable
A	Average total assets
ΔR	Change in sales revenue