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DEBT COVENANTS VIOLATION AND EARNINGS MANAGEMENT

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ABSTRACT

The present research aims to establish the relationship between closeness to debt covenants violation and earnings management. Central testable concept is debt covenants hypothesis which assumes that in reluctance of being subject to fines and penalties for non-compliance with debt covenants, managers of the borrowing firms are inclined to modify reported earnings. Following the common practice in the research area, debt-to-equity ratio is utilized as a proxy for closeness to debt covenants violation and discretionary accounting accruals are used as a substitute for earnings management. In the present work, discretionary accounting accruals are estimated by Jones (1991) model. Debt covenants hypothesis validity is examined on the sample of 102 Russian companies for the year of 2007. The analysis includes an additional variable which accounts for the impact of the degree of leverage on discretionary accruals. To control for differences in earnings management incentives, the model utilizes variables of size, profitability, stock valuation and liquidity. The effect of all factors on discretionary accounting accruals is examined by OLS regression.

The results reveal that Debt-to-Equity ratio and Dummy variable for Highly Leveraged Companies have an explanatory power over Discretionary Accounting Accruals. The relationship is negative implying that higher Debt-to-Equity ratio creates incentives for managers of the borrowing companies to use income-decreasing discretionary accruals which is aimed to present a company in a less favorable position. Possible rationale according to the previous studies suggests that the major expectation from applying such policies is getting reliefs and less restrictive conditions in loan agreements from the lenders. Liquidity is found to have a negative impact on discretionary accounting accruals suggesting that companies with lower liquidity requiring additional financing particularly in a form of cash manage their earnings upwards.

1. INTRODUCTION

Any corporation has stakeholders who rely on the validity of the financial information provided to them. They are composed of various groups and individuals who benefit from, or are harmed by, and whose rights are respected or violated by corporate actions. Stakeholders of the corporation include, but are not limited to: management, owners, lenders of capital, suppliers, employees, customers, and the local community (Donaldson & Werhane 1999: 251). The concept of stakeholders is a generalization of the notion of stockholders, the owners of the corporation, who themselves have some special claim on the corporation. Just as stockholders have a right to demand certain actions by management, so do stakeholders have a right to make claims. Published financial reports are aimed to provide the information on the basis of which stakeholders make economic decisions regarding particular company (Benedict &Elliott 2001: 353). Being the major source of information for stakeholders, financial reports must be of such a fair nature that it does not violate the rights and interests of all stakeholders (Gray&Manson 2007: 678).

Lenders of loan capital, one of the most influential groups of stakeholders, are particularly interested in financial figures of the borrowing companies as financial reports provide the basis for estimation of solvency of the latter. Moreover, under debt agreement borrowers are usually imposed with certain requirements and restrictions (mostly relating to financial figures, e.g., minimum ratio of current assets to current liabilities or of a minimum amount of shareholder's equity etc), so called *debt covenants*. Significant amount of research shows that with the purpose of avoiding penalties for non-complying with the covenants, managers of the borrowing firms are inclined to modify financial figures in a favorable direction. Such managers' actions are commonly referred as *earnings management*. The present research aims to test influence of debt covenants violation on earnings management in conditions of Russian market.

Most of the studies on earnings management employ either of the following definitions attempted by the earliest researchers in the area:

(1) Managing earnings is the process of taking deliberate steps within the constraints of generally accepted accounting principles to bring about a desired level of reported earnings. (Davidson, Stickney &Weil, 1987).

(2) Managing earnings is a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain (as opposed to say, merely facilitating the neutral operation of the process). A minor extension of this definition would encompass "real" earnings management, accomplished by timing investment or financing decisions to alter reported earnings or some subset of it. (Schipper, 1989).

(3) Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers (Healy&Wahlen, 1999).

In such a way, there is no generally accepted definition of earnings management. Combining all the definitions above earnings management may be seen as affecting: a) accounting accruals applying managerial discretion in accounting policies; b) reported cash flows through everyday business decisions or specific transactions. Both actions are performed with the purpose of achieving target financial figures and displaying the company's position as more favorable. It should be noted, however, that the present paper focuses on earnings management exercised exclusively via accounting policies choices. Research of effect of operational decisions, such as, for instance, intentional reduction of some types of expenses, changes in investment or financing strategies is beyond the scope of the study. In this paper earnings management achieved by fraudulent and non-fraudulent activities are seen as two different categories. So the notion of earnings management used in the study refers only to non-fraudulent activities that stay within the legal boundaries.

Hence, mentioning earnings management term the research does not consider any illegal actions. These may include, but are far not limited to: a) recording fictitious sales or expenses; b) creating special purpose entities for the purpose of mutual trading and thus inflating earnings; c) including fake inventory items (especially goods in transit); d)

holding fiscal period books open and recording subsequent period sales as relating to previous period until target sales are met (Mulford & Comiskey 2002:70).

Reported earnings is the sum of cash flows from operations and accounting adjustments that are called accruals. Positive accruals imply that the firm records earnings that are larger than the cash flow generated by its operations. Beneish (2001) states that the effect of any earnings management is most likely to occur in the accruals (rather than cash flow) component of earnings. Accruals are not, however, of themselves, evidence of earnings management. Detecting earnings management requires separating the non-discretionary component of accruals (the portion of accruals that is legally stipulated) from the discretionary component (the portion of accruals that is due to managerial discretion).

Managers, being authorized to apply certain degree of discretion in accounting and operational decisions, may manipulate earnings through a variety of managerial choices. Earnings management manipulations can be either of an accounting-based or an operations-based (also referred in literature as real-based) nature (Crumbley, Heitger, Smith, & Stevenson 2003).Accounting-based earnings management manipulations include for example, changing accounting methods, increasing earnings to meet a budget target, or changes in accounting estimates, e.g. bad debt reserves, life of depreciable assets, and inventory obsolescence. Beneish (2001) among other accounting based means points on changing the depreciation schedule, delaying the recognition of expenses, and accelerating the recognition of revenues, while all legitimate, can generate accruals and boost earnings.

While the present study focuses on accounting-based earnings management, the author admits, however does not state, the existence of real earnings management in sample companies. In order to compose the complete picture of possible factors that might affect earnings manipulations, a brief overview of existing literature on operation-based earnings management exercised through everyday business decisions is provided in the Literature Review Section.

1.1. Purpose of the Research

The present paper is aimed to test the validity of debt covenants hypothesis in conditions of Russian market. Thus, it addresses the following question: what is the effect of debt covenants violation on earnings management? Debt covenants hypothesis was subject to a significant empirical testing (see e.g., Sweeney 1994; DeFond & Jiambalvo 1994; Dichev & Skinner 2002; Gopalakrishnan 1994; Iatridis & Kadorinis 2009; Othman & Zegak 2006). With the purpose of avoiding penalties for non-complying with the covenants, managers of the borrowing firms are inclined to modify reported figures in a favorable direction. As found by Duke&Hunt (1990), debt-to-equity ratio is a good surrogate for the closeness to or existence of debt covenant restrictions for over 60 percent of restrictions that relate to retained earnings, working capital, and net tangible assets therefore it is adopted as a proxy for closeness to debt covenants violation in the present study.

Relying on the previous studies, it is hypothesized that debt to equity ratio, which is widely accepted as a proxy to measure debt covenant violation, is likely to affect earnings management. As a result, debt covenant violation is expected to inflate accounting accruals. There is however, an alternative hypothesis stating the inverse relationship based on the results of the previous empirical studies. The research utilizes the sample of 102 Russian companies and covers the period of January-December 2007. Initially, there is a need in estimating discretionary accruals which is performed using cross-sectional Jones (1991) model which is most widely used by the previous researchers. It states that managers rely on their ability to use discretion regarding certain accruals and thus requires discretionary and non-discretionary components of accruals to be separated, so that the discretionary accruals can be used as proxy to test for earnings management. For specification of the model and comparison with other methods of discretionary accruals estimation see Section 3.

Afterwards, in order to test the validity of debt covenants hypothesis, discretionary accruals are regressed against debt-to-equity ratio and a set of control variables. Control variables were selected in accordance with the frequency of similar studies and

availability of data for Russian market and account for size, profitability, stock valuation and liquidity. The factors affecting earnings management are divided into the groups depending on the corresponding underlying hypothesis listed in the previous studies. In such a way, debt covenants hypothesis (H1) contains an assumption about influence of debt-to-equity ratio (D/E) and Dummy for highly leveraged companies (DHL) on earnings management. Controlling variables are also referred to the corresponding hypotheses. Thus, political cost hypothesis (H2) makes an inference about the effect of the company's size (LnTA) and profitability (OPM) on earnings management while H3 which is related to capital market incentives assumes the specific relation of market stock valuation (P/B) and Current ratio (CR) with earnings management.

The analysis also includes an additional variable which accounts for the impact of the degree of leverage on discretionary accruals which takes the value of either 0 or 1 depending on the level of Debt-to-Equity ratio for each sample company. The threshold for high leverage is chosen based on the sample mean and distribution of Debt-to-Equity ratios across the sample companies. The model is later adjusted to eliminate the possible effect of correlation between Debt-to-Equity ratio and Dummy Variable for Highly Leveraged Companies. Thus, two additional regressions are performed each excluding one of the two interrelated variables. All the independent variables included are calculated for the beginning of the year 2007 to examine their impact on managers' incentives to modify earnings subsequently during the year.

1.2. Structure of the Study

The paper is organized as following. Chapter 1 provides background information along with definition of key terms and introduces the research problem. Chapter 2 presents literature review on the topic area. This chapter is divided into three sections. The fist section describes the concept of operations based earnings management and briefly lists the results of studies carried in the area. The second section of summarizes major empirical finings on debt covenants hypothesis, which is central in the present research. Overview of other factors empirically found to affect earnings management is presented

in the last section of Chapter 2. Chapter 3 describes the existing theory on models for earnings management estimation and provides their evaluation. Chapter 4 states testable hypothesis and provides information about the data researched and methodology applied. Chapter 5 reports empirical results of the study and is followed by Chapter 6 presenting summary of empirical findings, research limitations, areas for further studies and concluding remarks.

2. LITERATURE REVIEW

2.1. Operations-based earnings management

While the present study focuses on accounting-based earnings management, the author admits, however does not state, the existence of real earnings management in sample companies. The former affect accruals, whereas the latter influences operating cash flows. In order to compose the complete picture of possible factors affecting earnings manipulations, a brief overview of existing literature on operation-based earnings management exercised through everyday business decisions is provided.

Operations-based earnings management (also referred as real earnings management) is defined as a purposeful action by management of a company to alter reported earnings in a particular direction, which is achieved by changing the timing and/or structuring of an operation, investment and/or financial transaction with cash flow effects and has sub-optimal business consequences (Zagers-Mamedova 2008). Real earnings management is performed through everyday operational decisions and include for example, accelerating production, or stockpiling excessive inventory not needed until well into the following year. In addition, Healy&Wahlen (1999) claim that managers may also exercise judgment in working capital management such as inventory levels, the timing of inventory shipments or purchases, and receivable policies, which affects cost allocations and net revenues.

Other factors researched are: stock repurchases (Hribar, Jenkins& Johnson 2006; Bens et al. 2003; Nagar&Skinner 2003), sales of fixed assets (Herrmann, Tatsuo& Wayne 2003; Bartov 1993), sale price reductions (Jackson and Wilcox 2000), overproduction along with sales discounts (Roychowdhury 2006) , cutting investments (Penman & Zhang 2002). In general, most of the existing work focuses on R&D expenditures (Baber et al. 1991; Bartov, 1993; Dechow &Sloan 1991; Bushee 1998; Cheng 2004). Baber et al. (1991) found that relative R&D spending is significantly less when spending may reduce the ability to report positive or increasing income in the current

period. In most instances, choices among accounting practices have no direct cash flow consequences, but   changes in R&D spending to satisfy current-period income objectives do alter cash flow.

Dechow and Sloan (1991) investigate the hypothesis that chief executive officers (CEOs) in their final years of office manage discretionary investment expenditures to improve short term earnings performance. The authors examine the behavior of R&D expenditures for a sample of firms in industries that have significant ongoing R&D activities. The results suggest that CEOs spend less on R&D during their final years in office. Next to Dechow and Sloan, Bushee (1998) examines firms trying to meet previous year's earnings and finds that they reduce R&D more if they have lower institutional ownership. The study found evidence that R&D reductions by firms trying to meet earnings thresholds are potentially value-destroying and are prevented by the presence of sophisticated investors. Also evidence exists on firms engaging in a whole range of activities in addition to just R&D expense reduction.

Cheng (2004) provides evidence that compensation committees establish a greater positive association between changes in R&D spending and changes in CEOs options in order to prevent opportunistic reductions in R&D spending. The author defines the horizon problem as the CEOs that are 63 or older, and myopia as a firm facing a small earnings decline or a small loss. There are few studies about how managers use specific transactions, other than cutting R&D expenditures, to influence earnings. Some of the studies focus on stock repurchases (Hribar et al. 2006; Bens et al. 2003; Nagar&Skinner 2003), examine the sales of fixed assets (Herrmann et al. 2003; Bartov 1993), sale price reductions (Jackson & Wilcox 2000), overproduction along with sales discounts (Roychowdhury 2006); cutting investements (Penman & Zhang 2002). Detailed study of operations-based earnings management is beyond the scope of the present study. Rather, it focuses on accounting-based earnings management exercised through managerial discretion on accounting policy choices.

2.2. Relation between Debt Covenants Violation and Earnings Management

2.2.1. Debt Covenants as an incentive for earnings management

Under debt contracts borrowers are usually obliged to comply with debt covenants agreed by both contract parties. Debt covenants are defined as provisions in credit or debt agreements that call for the maintenance of certain amounts and relationships (Mulford & Comiskey 2002:87). A positive covenant might require the maintenance of minimum ratio of current assets to current liabilities or of a minimum amount of shareholder's equity. A negative covenant could restrict the amounts of dividend payments or capital expenditures. Such covenants are designed to provide the lender with some degree of control over the activities of the debtor and, by doing so, to increase the likelihood of the loan being repaid.

Smith (1993) assumes that lenders use debt covenants as an early warning signal to maintain close scrutiny over the performance of the borrower. He argues that one stylized strategy for private lenders to follow is to set debt constraints just below the actual current value. If the firm's operating performance is in line with normal business conditions or better, covenants are not violated and the debt is serviced as normal. If, alternatively, the firm's operating performance deteriorates, covenants are quickly violated, giving the lender the ability to reassess the loan. The lender then obtains updated information from the firm, including its managers' forecasts about future performance, and decides on an action from its discretion of alternatives.

If the lender believes that the firm remains a potential risk, it resets the constraint, again to just below the current level and so maintains its ability to step in at short notice if operating performance deteriorates further. If the firm's performance improves, there is no further violation and the debt is serviced as normal. However, if performance continues to deteriorate, the lender again renegotiates, and may eventually get to the point where more drastic alternatives are necessary.

Gopalakrishnan (1994) specifies a number of possible debt covenants:

1) Maintenance of minimum working capital, tangible net worth, profitability, quick ratio etc;

2) Restrictions on investments and acquisitions, pledging certain assets;

3) Restrictions on incurring additional indebtedness;

4) Restrictions on incurring additional capital expenditures;

5) Restrictions on the ability of the firm to encumber its assets or engage in certain transactions outside the normal course of business;

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 (e.g., Beneish & Press 1993;1995). For example, in their study of 91 firms that violated accounting-based covenants in debt agreements Beneish & Press (1993) report considerably large costs of violation. Average incremental interest costs (so called refinancing costs as a result of interest rate increase) vary between 0.84-1.63 % of the firms' market value of equity. In case of lender's demand of full of partial loan repayment, debt restructuring cost for the borrower constitutes 0.37% of sample firms' market value of equity. In addition to these costs, increased lender control is an important effect of technical violation. The study observes that lenders add numerous new covenants.

Interestingly, only few of these are accounting-based, which suggests that more control over everyday business operations and decisions is imposed. The majority of new covenants consists of restrictions on investing and financing activities to prevent further dissipation of assets. Therefore, authors conclude violation of debt covenants is extremely costly to the borrower resulting in average costs we range between 1.2-2% of market value of equity; alternatively, the losses represent between 4.4-7.3% of the outstanding balances of the violated debt agreements.

As a result, in an effort to avoid these undesirable effects and comply with debt covenants, managers of the borrowing firms may be motivated to apply certain degree of discretion in accounting policies in order to manage accounting numbers and report favorable figures. (There are obviously plenty of other factors besides the willingness to abide by debt covenants which may potentially affect managers' incentive to alter earnings. Please, see Appendix 1 for factors listed by Mulford & Comiskey (2002:61)).

The *debt covenants hypothesis*, also referred as *debt/equity hypothesis or debt hypothesis,* developed by Watts and Zimmermann (1990), is the major presumption tested by researchers subsequently studying the impact of debt covenants on earnings management. Under this hypothesis, managers have incentives to make financial reporting decisions that reduce the likelihood that accounting-based covenants in their firms' debt agreements will be violated. The strength of these incentives depends on the costs of violating the firm's debt covenants, that is, on the costs of technical default (Smith&Warner 1979; Holthausen&Leftwich 1983). The debt/equity hypothesis assumes the following trend: the higher the firm's debt/equity ratio, the more likely managers use accounting methods that increase income.

According to Watts&Zimmerman (1990), there is a considerable influence of tightness of the covenant constraint on the probability of a covenant violation and of incurring costs from technical default. Managers exercising discretion by choosing income increasing accounting methods relax debt constraints and reduce the costs of technical default. Kalay (1982) also claims that the higher the debt/equity ratio, the closer (i.e., "tighter") the firm is to the constraints in the debt covenants. Debt covenants hypothesis has been subject to considerable amount of empirical research. Major findings on the evidence obtained are summarized in the following section.

2.2.2. Empirical evidence in favor of debt covenants hypothesis

Watts& Zimmerman (1986) suggest that accounting policy choices, are influenced, among other factors, by constraints based on accounting numbers of debt contracts. Considerable amount of research also suggests that debt covenant violations, which may

result in acceleration of debt maturity and heavy recontracting costs, are likely to impact accounting policy choices in favor of income-increasing techniques thus supporting debt covenants hypothesis (see e.g., Sweeney 1994; DeFond & Jiambalvo 1994; Dichev & Skinner 2002; Gopalakrishnan 1994; Iatridis & Kadorinis 2009; Othman & Zegak 2006). However, there is empirical evidence which contradicts debt covenants hypothesis showing debt/equity ratio commonly accepted as a proxy for debt covenants violation to be insignificant in explanation of earnings management (see e.g., De Angelo 1994; Jaggi&Lee 2002; Darrough, Pourjalali& Saudagaran 1998).

Findings of some studies indicate that managers of financially distressed firms, especially firms with debt covenant violations, may respond with income-increasing accounting policy choices. For example, Sweeney (1994) finds that managers respond more with income increasing accounting methods when firms are faced with technical default. Sweeney (1994) examines association between debt covenant violations and adoption of income-increasing accounting changes and find that the debt covenant violations lead to adoption of income-increasing accounting changes so that the default costs imposed by lenders are minimized. Her study is based on a test sample of 130 firms that violate debt covenants for the first time during the 1980-89 period and on a matched control sample. The choice of accounting methods includes voluntary accounting changes, changes in estimates, and the timing of adoption of mandatory accounting changes. The results indicate that the managers of sample default firms make a greater number of income-increasing accounting changes relative to the control sample firms. The author concludes that the managers of firms approaching technical default would respond with income-increasing accounting methods.

Similarly, DeFond & Jiambalvo (1994) detect income-increasing abnormal accruals one year prior to debt covenant violations and also to some extent in the year of violation after controlling for management changes and auditors' going-concern qualifications. This study examines the abnormal accruals of a sample of 94 firms that reported debt covenant violations in annual reports using time-series and cross-sectional models to estimate 'normal' accruals. In the year prior to violation, both models indicate that 'abnormal' total and working capital accruals are significantly positive. In the year of

violation, there is evidence of positive abnormal working capital accruals after controlling for management changes and auditor going concern qualifications.

Principal results of Dichev&Skinner (2002) are also consistent with the debt covenant hypothesis: the study discovers an unusually small number of loans/quarters with financial measures just below covenant thresholds and an unusually large number of loan/quarters with financial measures at or just above covenant thresholds. It is also concluded that these effects are more pronounced before initial violations, when managers' incentives to avoid violations are likely to be strongest. Another significant finding of this paper corroborates the idea of Smith (1993) regarding tightness of debt covenants setting by the lenders. According to Dichev &Skinner (2002), covenants in private lending agreements are set tightly relative to the variation in the underlying variables and that violations are common, occurring in approximately 30% of loans. This suggests that private lenders use covenants as "trip wires" which provide them with an option to step in and take action when circumstances warrant, and that violations do not necessarily indicate that borrowers are in serious financial difficulty.

Gopalakrishnan (1994) has researched accounting choices relating to depreciation and inventory valuation in the companies with short-term debt only. Sample for the period of 1983-1987 included 727 reporting depreciation and 690 firms reporting inventory method choices. Straight-line method and FIFO are accepted as income- increasing methods; accelerated method and LIFO are accepted as income-decreasing methods for depreciation and inventory valuation, respectively. Regarding depreciation method choice, the findings support for the hypothesis that the higher the leverage, the greater the likelihood that a firm will choose straight-line depreciation method. However, interesting implication about this finding is the role of leverage as a significant determinant of accounting choice even in the extreme case of firms with no long-term debt. As long as there are constraints present in the lending agreements, whether short-term or long-term, managers are likely to relax the tightness of those constraints by choosing income-increasing accounting methods. Therefore, leverage, measured here as total short-term liabilities over equity, is a determinant of accounting choice (also after controlling for tax and profitability factors).

Study of Iatridis & Kadorinis (2009) focuses on the investigation of motives for and characteristics of 239 UK firms that for the period of January- December 2007. Besides debt covenants violation factor, the authors concentrate on the provision of voluntary accounting disclosures, management compensation, and on the equity and debt capital needs of firms and their relation with the use of earnings management. The study examines also the earnings management inclination of firms that seek to meet or exceed financial analysts' forecasts. The findings generally indicate that firms with low profitability and high leverage measures are likely to use earnings management. Also, firms that are in equity and debt capital need and are close to debt covenant violation also appear to be inclined to employ earnings management practices. Likewise, firms tend to use earnings management to improve their financial numbers and subsequently reinforce their compensation and meet and/or exceed financial analysts' earnings forecasts. In contrast, the study shows that firms that provide voluntary accounting disclosures appear to be less inclined to make use of earnings management.

Othman & Zeghal (2006) investigating factors that influence earnings-management with reference to the Anglo-American and Euro-Continental accounting models, suggest that difference between earnings management practices and incentives is a result of discrepancy in socio-economic environments. Study focuses on the sample of 1470 Canadian (which belongs to Anglo-American socio-economic environment) and 1674 French (which belongs to Euro-Continental socio-economic environment) firm-year observations. Empirical tests are consistent with debt covenants hypothesis show that debt-to-equity ratio, is positively associated with positive accounting accruals and negatively associated with negative accounting accruals for French firms. Contrary to the findings for French firms, the debt-to-equity ratio is found to have no major impact on earnings-management behavior for Canadian firms. The French environment seems to give more credit to the debt hypothesis than does the Canadian environment. Within the French environment, bank loans contribute heavily to an upward earnings management in order to avoid the violation of debt covenants. Further, managing earnings upwards represents a positive signal to lenders, particularly financial institutions, to continue providing firms with funds at favorable conditions. The authors

conclude that higher the debt-to-equity ratio obviously contributes to the management of earnings upwards.

2.2.3. Empirical evidence contradicting with debt covenants hypothesis

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 in order to avoid debt covenant violations (e.g., De Angelo 1994; Jaggi&Lee 2002; Darrough, Pourjalali& Saudagaran 1998; Becker et al. 1998). Despite the fact that such accounting policies contradict with the common sense at the firs glance, the researchers provide reasonable explanations for the results obtained.

DeAngelo et al. (1994) found that managers of financially troubled firms use negative abnormal accruals, which reduce the reported earnings even further. The authors examine the impact of persistent losses and dividend reductions based on discretionary accruals on a sample of 76 financially troubled firms. They find that the managers of firms with and without binding dividend covenants engage in significant negative abnormal accruals. These findings are interpreted to suggest that the managers' preference would be to highlight the firms' financial difficulties rather than to inflate the earnings to avoid covenant violations or to portray the firm as less troubled. They interpret these findings to suggest that managers of financially troubled firms would highlight the firm's financial difficulties by reducing the reported earnings so that they could obtain better terms in their contract renegotiations.

Findings of Jaggi&Lee (2002) are generally consistent with the results obtained by DeAngelo (1994) study. Here authors examine how the choice of income-increasing or income-decreasing discretionary accruals is related to the severity of financial distress and whether this choice is also influenced by the creditors' waivers of debt covenant violations. The firms are defined as debt covenant violation firms if they report violations of debt covenants relating to working capital, debt-equity ratio, dividends etc. Companies are considered as debt-restructuring if they replace their troubled debt with equity and/or creditors agree to extend debt maturity or reduction in installment

payments of principal. Debt covenant violation firms, in their turn, are categorized into waiver and nonwaiver firms. The firms are termed as "waiver" if they are able to obtain waivers from creditors for debt covenant violations so that creditors completely ignore debt covenant violations and impose no penalty or settle the violations on payment of a settlement fee. The firms are considered as nonwaiver firms if they are unable to obtain waivers and are subject to penalties, which may include reclassification of long-term debt as a short-term liability, increase in the interest rate, changes in debt constraints, and so on.

The results of the study indicate that there is a significant association between waiver firms and positive discretionary accruals. On the other hand, there is a significant association between nonwaiver firms and negative discretionary accruals, especially for debt restructuring firms. Financially distressed firms are likely to use income-increasing discretionary accruals when they expect that waivers would be granted for debt covenant violations, and income-decreasing discretionary accruals when they expect that waivers would not be granted, especially when the financial distress leads to restructuring of debt. This implies that companies experiencing severe financial distress will try to highlight their difficulties with the purpose to obtain better loan terms and/or favorable limits for debt constraints.

Study of Darrough et al. (1998) has also attained the results which contradict with the general notion of debt covenants hypothesis. The population researched includes 1440 Japanese companies for the years of 1989-1992. Study suggests debt/equity ratio used as a proxy for closeness to debt covenants violation, to have no explanatory power for earnings management. Becker et al. (1998) observe 10 881 companies for the period 1989-1992. The authors classify firms being among the highest decile of leverage in the sample as financially distressed. The study reports that high leverage may induce income-decreasing earnings management in financially distressed firms in view of contractual renegotiations. The rationale of such findings suggests that managers of financially troubled firms would tend to reduce reported earnings and portray the company's position as less favorable in a hope for renegotiation and better loan terms. The results obtained along with their interpretation are similar to those provided by De

Angelo et al. (1994). In such a way, empirical results in the relationships between accounting choices and debt covenant violations are mixed.

Beneish et al. (2001) argue that controversial evidence of the existing studies on the association between accounting choices and debt covenant violations is probably due to differential economic incentives for avoiding default, and they extend this research by examining the association between incentives to avoid debt covenant and insider trading. Their findings suggest that managers use income increasing accounting choices to avoid default, especially when they engage in abnormal insider selling. Jaggi&Lee (2002) also suggest that findings of their paper contribute to the explanation of divergence in results of the previous studies as they consider additional factor of financial distress severity to influence the choice between income- increasing and income-decreasing accounting choices.

2.3. Other major factors affecting Earnings Management

2.3.1. Political cost hypothesis

Size and profitability of the company have been empirically found to be among the major determinants of earnings management in previous studies. The role of the company's size in earnings management process is conveyed by *political cost hypothesis* proposed by Watts & Zimmerman (1986) which states that the larger the firm, the more likely the manager is to choose accounting procedures that defer reported earnings from current to future periods as larger and more profitable firms attract more attention of the governmental bodies. Under the hypothesis, politicians have the power to adversely effect upon corporations wealth re-distributions by way of corporate taxes, regulations, subsidies etc.

Naturally the companies affected by such actions are selected based on profitability (and size) indicators. Moreover, certain groups of voters have incentives to lobby for the "nationalisation, expropriation, break-up or regulation of an industry or corporation", which in turn are seen to provide incentives to politicians to propose such actions. This idea that politicians seek to intrude into the affairs of corporations and redistribute

wealth away from them comes from the earlier work of Stigler (1971), Peltzman (1976) and Jensen & Meckling (1978). Later Watts & Zimmermann (1986) tied this supposition with earnings management incentives. In such a way, political pressure to reduce prices or face the penalties which may result from the investigation of firms which are suspected of breaching anti-trust rules or otherwise taking advantage of the general public may create incentives for firms to manage earnings. Firms are expected to manage their earnings so as to seem less profitable in order to lower their political risk. The authors claim however that this concept applies more to the largest companies and is mostly driven by oil and gas industry.

As a corroboration of political cost hypothesis, Han & Wong (1998) found that firms who expected to profit from the sudden product price increases use accounting accruals to reduce earnings and thus political sensitivity. Specifically, oil firms' accruals are analyzed in a period of rapid gasoline price increases during the 1990 Persian Gulf Crisis. Event study approach is employed in the paper to analyze the trend in accruals of oil companies. A sudden increase in oil prices as a result of Iraq's invasion of Kuwait in August 1990 naturally caused a substantial rise of profits. Because the public and politicians tend to pay attention to reported earnings in such cases, the political cost hypothesis suggested that oil companies may have incentives to reduce reported earnings to minimize likelihood of adverse political actions.

The results indicated that petroleum refining firms used income-decreasing accruals in the third and fourth quarters of 1990 (after invasion) to decrease unusually large earnings increases. Similar trend was demonstrated by crude oil and natural gas firms through using inventory policies (LIFO firms purchased additional inventory) and specific items (writing down the values of aging and unwanted oil fields and added reserves for restoration of oil fields and refineries). In addition, authors find that petroleum refining firms with greater earnings increases were more likely to delay their fourth quarter earnings releases for 1990 fiscal year.

Christie (1990) has revealed size of the company along with other factors such as managerial compensation, leverage, risk, and constraints on interest coverage and dividends to have explanatory power over accounting methods choice.

In one of the fundamental studies of the area, Jones (1991) tests whether firms that would benefit from import relief regulations (e.g., tariff increases and quota reductions with the aim to support domestic suppliers) attempt to decrease earnings through earnings management during import relief investigations by the United States International Trade Commission (ITC). The import relief determination made by the ITC is based on several factors that are specified in the federal trade acts, including the profitability measures. Explicit use of accounting numbers in import relief regulation provides incentives for companies to manage earnings in order to increase the likelihood of obtaining import relief and/or increase the amount of relief granted. The author finds that managers make income-decreasing accruals during import relief investigations. Moreover, the analysis has shown discretionary accruals to be more income-decreasing during the year the ITC completed its investigation than would otherwise be expected (expectations were constructed based on firm-specific expectations models used to estimate "normal" total accruals).

In contrast to the above listed empirical findings, Young (1999) failed to prove political cost hypothesis and has established no significant association between company's size and earnings management. The study is aimed to evaluate using the data of 758 non-financial UK firms for the period of 30 June 1993 to 31 May 1996. Companies' size is proxied by natural logarithm of beginning of period sales. The results obtained by the author attract specific attention due to the fact that discretionary accruals were estimated utilizing all five models described in the present study under Theoretical Framework section. However, none of the accruals estimated were explained by size of the company in subsequent testing.

2.3.2. Capital market and stock price incentives

The widespread use of accounting information by investors and financial analysts to help value stocks has led some academics to hypothesize that managers are inclined to manipulate earnings with the purpose of influence short-term stock price performance as claimed by Healy & Wahlen (1999). A significant amount of studies have been undertaken in this area, examining the practice of earnings management in various situations. One of the most significant motivations for earnings management under

capital market reasons is to encourage investment in a firm, through offerings of stock. It has been found that firms report positive unexpected accruals which increase income before initial public offers (IPOs), seasoned equity offers (SEOs), and stock-financed acquisitions.

Teoh, Wong & Rao (1998) examining whether manages select accruals at the time of IPO to report high earnings conclude that firms undertaking an IPO are more likely than firms not doing so to have income-increasing depreciation policies and bad debt allowances in the year of the offering. During the year of going public, the return on sales of IPO companies is significantly higher relative to subsequent years, and relative to non-issuing industry peers. Post-issue, when high abnormal accruals cannot be sustained, IPO firms earn considerably less than non-issuing industry peers and previously similarly-performing matched non-issuers. Moreover, analysis showed that IPO companies with high abnormal accruals at the time of issue subsequently underperform most in three years after issue. Testing for accounting methods chosen it was revealed that compared with similarly performing non-issuing peers, IPO firms use more income-increasing depreciation methods and provide less for uncollectible accounts receivable. Taken altogether, the evidence of the study is consistent with firms inflating earnings when going public by managing accounting accruals.

The results obtained by Roosenboom, Van der Goot and Mertens (2003), corroborate those of the above study showing that earnings management are utilized on the grounds of capital market incentives. Using a sample of 64 Dutch companies which went public on Euronext Amsterdam between January 1984 and December 1994, the authors investigate the pattern of discretionary current accruals over time. It was found that company's earnings are managed in the first year as a public company, not however in the years before the IPO. Examining the impact of earnings management on the long-run stock price performance of IPOs, the study establishes a negative relation between the size of discretionary current accruals in the first year as a public company and long-run stock price performance over the next 3 years. It was also revealed that on average, IPOs experience an adverse cash flow change in their first year as a public company. These IPO firms can choose between reporting an earnings decrease or an earnings increase with the help of accounting accruals. If firms choose to do the latter, they face

long-term costs. Since current accruals tend to reverse in the future, they are betting that future cash flows will improve. However, on average, cash flows do not improve sufficiently in the following year to offset the reversal of current accruals for the average IPO firm. In the following year, especially poor quality IPO firms are forced to reflect the unavoidable reversal of current accruals in their earnings number. The detection of earnings management leads outside investors to downwardly adjust their valuation of IPO firms that engage in accrual based earnings management.

Rangan (1998) analyzing a sample of 230 SEOs by US companies during the years 1987-1990, shows that discretionary accounting accruals in the period surrounding the offering predict a portion of the subsequent poor earnings and stock price performance. The author finds that discretionary accruals during the year around the offering are negatively correlated with earnings changes in the following year. A one-standard-deviation increase in discretionary accruals is associated with an earnings decline of about two to three cents per dollar of assets. Discretionary accruals around the offering also predict market-adjusted stock returns in the following year. A one-standard-deviation increase in discretionary accruals is associated with a decline in market-adjusted stock returns of about 10%.

As a conclusion, the author states that stock market does not correctly value the implications of discretionary accruals for subsequent earnings. Rather, the market appears to extrapolate earnings growth associated with discretionary accruals and hence overvalues issuing firms. Subsequent to the offerings, when the reversal of discretionary accruals causes earnings to decline, the market is surprised and corrects its valuation errors. Because at least some of the discretionary accruals reflect deliberate earnings management it is asserted that issuing firms can manipulate their stock price by managing earnings.

Similar results were obtained by Kim & Park (2005) who test the relations between earnings management by firms offering seasoned equity issues and the pricing of their offers. Researchers claim that equity issuers have an incentive to boost their earnings before an offering as well as push the offer prices up to increase offering proceeds and minimize the degree of underpricing. The authors point on the obvious direct impact of

the offer price in an equity offering on the issuer's wealth. For a sample of 3,762 US SEOs from 1989 through 2000, the study establishes a negative relation between SEO underpricing and discretionary accruals, suggesting that seasoned equity issuers that actively engage in earnings management also push the offer price up to receive more proceeds from their offerings. Furthermore, the association between SEO underpricing and earnings management is found to be more significant for issuers with high information asymmetry than for those with low information asymmetry.

The work of Koh (2003) also supports, though indirectly, the idea that earnings are managed upwards based on capital market incentives. Analysis of 836 Australian companies during the years of 1993-1997 suggests that lower institutional ownership, which implies short-term oriented investment and an emphasis on stock prices over long-term profits, is correlated with increased earnings management in the form of positive accruals.

Income-increasing earnings management practice is found to be utilized during stock-financed acquisitions as well (in some corporate mergers, acquiring firms use their stocks rather than cash to purchase the target companies' stock or assets). According to Erickson & Wang (1999), in stock transactions, unlike cash deals, the value of the consideration received by target shareholders depends on the market value of the acquiring firm. That is, the number of acquiring firm shares exchanged with target shareholders is normally determined by the value of the acquiring firm's stock on the merger agreement date. Holding other things equal, a higher stock price reduces the number of shares that the acquiring firm must use in the exchange, as the authors claim.

Therefore, acquiring company has an incentive to increase its stock price before the agreement of a stock corporate merger. One way an acquiring firm might attempt to increase its stock price is through increased accounting earnings. Having examined the sample of 55 stock-for-stock corporate mergers performed during 1985-1990, the researchers indicate that in the quarters prior to the merger, acquiring firms manage earnings upward. Moreover, the degree of income increasing earnings management is found to be positively related to the relative size of the merger. This result is consistent

with the idea that acquiring firms use accounting procedures in an attempt to increase their stock price prior to stock for stock mergers.

The research carried by Louis (2004) also supports the concept. The author finds strong evidence suggesting that acquiring firms report significant positive abnormal accruals in the quarter preceding stock swap announcements in an attempt to increase stock price, and thus, decrease the number of shares for merger transaction. This study provides an explanation for the post-merger underperformance anomaly. It shows, by the test of the effects of earnings management on the performance of acquiring firms, that reversal of effects of pre-merger earnings management is a significant determinant of both the short term and the long-term performance of stock-for-stock acquirers. Further analysis reveals significant negative correlation between the discretionary accrual and the stock-for-stock acquirers' long-term performance. The research also indicates that the post-merger reversal is not fully anticipated by financial analysts in the month immediately following the merger announcement.

It can thus be derived from the results of the above mentioned studies that earnings management is used to increase income and therefore show the firm to be more profitable, in order to make investors more willing to invest money in the firm by buying its stock at the same time benefiting from the artificial stock price increase. Conversely, other studies show that there is an incentive to understate earnings prior to management buyouts (MBOs). Management buyout is a form of acquisition where a company's existing managers acquire controlling interest in the company (Van Horne & Wachowicz 2005:23). The researchers suggest that the incentive to manage earnings downwards is to make the buyout easier and cheaper, allowing the firm's management to offer a price which appears to be reasonably above the market price yet which is still below what the firm is actually worth, since the market price would not accurately reflect the firm's underlying economics. Several studies examine earnings management prior to management buyouts.

This hypothesis is supported in a study by Perry & Williams (1994) which examines unexpected accruals controlling for changes in revenues and depreciable capital. The results indicate that unexpected accruals are negative (income-decreasing) prior to

MBO. The analysis of a sample of 175 management buyouts during 1981-88 provides evidence of manipulation of discretionary accruals in the predicted direction in the year preceding the public announcement of management's intention to acquire for control of the company

Wu (1997) examining pre-MBO stock prices indicates a clear downward movement which is systematically associated with pre-MBO earnings changes. The study shows that earnings changes are significantly lower than the industry median change in the year before the management buyouts using the data of 87 cases during 1980-1987. Moreover, pre-announcement declines in earnings are specific to MBOs. In the case of third-party takeover, income did not decline in the pre-announcement period. Taken together, the overall evidence favors the hypothesis that managers manipulated earnings downwards prior to the MBO proposal. In contrast to the above described empirical results, DeAngelo (1988), does not find much evidence supporting this theory. The study reports that earnings information is important for valuations in management buyouts and hypothesizes that managers of buyout firms have an incentive to "understate" earnings. However, little evidence is found in favor of this hypothesis from an examination of changes in accruals.

2.3.3. Earnings forecasts and income smoothing hypothesis

Another significant motivation studied by the researchers is *meeting forecasted earnings targets*. Extant amount of literature indicates that meeting analyst expectations is a fundamental earnings target. Severe stock market reactions to negative earnings surprises and a market reward to positive earnings surprises give managers strong incentives to use their discretion over reported earnings to meet expectations as claimed by Athanasakou, Strong and Walker (2008) . A number of studies have noted that there are an unusually large number of cases where analyst forecasts are exactly met or just surpassed, while there is an unusually low rate of near misses.

The study of Kasznik (1999) investigates whether managers who issue annual earnings forecasts manage reported earnings toward their forecasts in a fear of legal actions by investors and loss of reputation for accuracy. The results provide evidence consistent

with the prediction that managers use positive discretionary accruals to manage reported earnings upward when earnings would otherwise fall below management's earnings forecasts. It is also suggested that the extent of earnings management activity is positively associated with proxies for the increased likelihood and cost of litigation (e.g., costs of being sued) associated with management earnings forecast errors. In particular, more positive stock price changes at the time of, and subsequent to, forecast issuance and greater analyst following are associated with larger income-increasing discretionary accruals. Contrary to findings for firms whose managers have overestimated earnings, there is no evidence that managers who have underestimated earnings, manage reported earnings downward. Neither there is an indication that proxies for litigation costs explain variation in the magnitude of their discretionary accruals.

Evidence in the study by Burgstahler & Eames (2006) supports assertion that managers take actions to avoid negative earnings surprises, as distributions of earnings surprises contain an unusually high frequency of zero and small positive surprises and an unusually low frequency of small negative surprises. The authors conclude that these actions include both (1) upward earnings management, and (2) downward forecast management. The results suggest that both "real" operating actions, reflected in cash from operations, and actions of a "bookkeeping" nature, reflected in discretionary accruals, contribute to earnings management to achieve zero earning surprises.

Similarly, earlier work of Burgstahler & Dichev (1997) provides persuasive empirical evidence that earnings decreases and losses are frequently managed away. The evidence suggests that 8% to 12% of the sample firms with small pre-managed earnings decreases exercise discretion to report earnings increases (sample size is 64,466 for years of 1977-1994). Similarly, 30% to 44% of the firms with slightly negative pre-managed earnings exercise discretion to report positive earnings (sample size is 75,999 for years of 1976-1994). The results obtained are robust to alternative methods of scaling earnings and various ways of subdividing the population. Concentrating on earnings management to avoid losses, authors find evidence that two components of earnings, cash flow from operations and changes in working capital, are used to manage earnings. Two notions are presented to explain the main results of this paper. The first

explanation is that managers avoid reporting earnings decreases and losses to decrease the costs imposed on the firm in transactions with stakeholders. The second one is based on prospect theory, which postulates an aversion to absolute and relative losses.

Income smoothing incentive is close to the concept of meeting forecasted figures. Income smoothing is defined as the practice of carefully timing the recognition of revenue and expenses to even out the amount of reported earnings and minimize its variability from one year to another. (Albrecht, Stice & Stice 2007: 196). The theory developed by Fudenberg and Tirole (1995) suggests that concern about job security creates an incentive for managers to smooth earnings in consideration of both current and future relative performance. Key assumptions in this theory are that poor performance increases the likelihood of managements' dismissal and good performance in the current year will not compensate for poor performance in the future. Thus, according to the authors, the implications of this for earnings management are the following.

First, when current earnings are relatively low, but expected future earnings are relatively high, managers will make accounting choices that increase current period discretionary accruals. In effect, managers in this setting are "borrowing" earnings from the future. Second, when current earnings are relatively high, but expected future earnings are relatively low, managers will make accounting choices that decrease current year discretionary accruals. In this case managers are effectively "saving" current earnings for possible use in the future. As a result, the income is distributed among periods, or is said to be smoothed according to the managers' expectations. Empirical support of income smoothing hypothesis has been found by a number of studies.

Thus, De Fond & Park (1997) find that 3,636 (27.3 % of analyzed sample) of the firm-year observations are predicted to smooth earnings in accordance with the implications of the income smoothing motivations concept described above. Of these observations, over 89% make discretionary accruals choices consistent with the predictions. Moreover it was revealed that predictions of discretionary accruals performance based on both

current and future performance are much more accurate than predictions based only on current performance.

A recent study of Markarian, Pozze & Prencipe (2008) also corroborates income smoothing concept. The authors examine relationship between R&D capitalization decisions of 130 Italian companies for the period of 2001-2003 and income smoothing incentive. It is assumed that decision to capitalize R&D costs is related to a firm's change in profitability. The results indicate that firms that have a lower return on assets (compared to the average of the previous two years) are more likely to capitalize R&D expenditures, while firms that have improved performance are more likely to expense, consistent with the earnings-smoothing hypothesis. It should be noted that empirical research identified the factors besides the ones considered above which cause managers altering the reported earnings. Among those are: meeting dividend threshold, auditors' competence and quality, type and frequency of analysts' coverage etc. These factors however are beyond the scope of the analysis of present study.

3. THEORETICAL BACKGROUND

3.1. Measurement of earnings management

There are a number of empirical methods by which earnings management can be detected and measured. *Discretionary accruals method* is most commonly accepted method in the previous researches. It assumes that managers rely on their ability to use discretion regarding certain accruals and thus requires discretionary and non-discretionary components of accruals to be separated, so that the discretionary accruals can be used as proxy to test for earnings management. An alternative method known as *the single accrual method* also exists, whereby only one kind of accrual, for example, bad debt provisions, depreciation estimates or deferred tax valuation allowances, is used (see e.g. Mc Nichols&Wilson 1988; Gopalakrishnan 1994). Study of Mc Nichols (1988) considers a single accrual, the provision for bad debts, rather than a collection of accruals. Manipulation of this provision is viewed in this research as one of several ways to manage earnings.

However, the authors admit that the study uses the representative approach and thus the tests do not detect manipulation of accruals other than the provision for bad debts. Gopalakrishan (1994) examines earnings management through depreciation and inventory method choices. Single accruals method was subject to critics by Xiong (2006), who claims that this method is not as effective as the total accruals method, because it is difficult to identify one unique accrual used to manage earnings, and the result may not be large enough to be statistically significant. In addition, a single accrual may be affected by other variables.

The distribution method is another way of testing for earnings management where reporting losses is being avoided (see e.g. Burgstahler&Dichev, 1997). The distribution of reported earnings is tested to determine whether there is any evidence of earnings management. The advantages of this method are that no estimation of potentially 'noisy' accruals is required, and that it includes earnings management which relates to cash flows, such as reduced expenditure for research and development, or advertising. However, according to Healy&Wahlen (1999), it cannot indicate the specific accruals

used or the extent of earnings management. Nevertheless, as mentioned above, discretionary accruals method is the major method used to detect and estimate earnings management.

3.2. Overview of Major Models for Discretionary Accruals Estimation

This section specifies five major models for discretionary accruals measurement used in the extant literature and indicates their key underlying assumptions. The usual starting point for measurement of discretionary accruals is total accruals. A particular model is then assumed for the process generating the non-discretionary component of total accruals, enabling total accruals to be decomposed into a discretionary and non-discretionary component. Most of the models require at least one parameter to be estimated, and this is typically implemented through the use of "estimation period", during which no systematic earnings management is predicted.

The detection of earnings management through the use of discretionary accruals has been the object of study of many researchers. Accruals, whether discretionary or non-discretionary, is the most useful tool to utilize in effecting earnings management. Many researchers have studied the determination of accruals to estimate earnings management predictions. The researchers (Healy, 1985; Jones, 1991; Dechow, et al, 1995) were consistent in their studies of earnings management by using the following computation for totals accruals (TA) for using in the models described in the present chapter:

$$(1) \quad TA_{it} = \frac{\Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STD_{i,t} - Dep_{i,t}}{A_{i,t-1}}$$

where:

$\Delta CA_{i,t}$ = Change in current assets for period t

$\Delta CL_{i,t}$ = Change in current liabilities for period t

$\Delta Cash_{i,t}$ = Change in cash and cash equivalents for period t

$\Delta STD_{I,t}$ = Change in debt included in current liabilities for period t

$Dep_{i,t}$ = Depreciation and amortization expense for period t

$A_{i,t-1}$ = Total assets at the beginning of period t

However, subsequent researchers calculate total accruals as the difference between net income and operating cash flows (see e.g., Jaggi & Lee 2002).

The Healy Model

Healy (1985) tests for earnings management by comparing mean total accruals scaled by lagged total assets across earnings management partitioning variable. Healy's study differs from most other studies in that he predicts that systematic earnings management occurs in every period. Partitioning variable divides the sample into three groups, with earnings predicted to be managed upwards in one of the groups and downward in two other groups. Inferences are the made through pairwise comparisons of the mean total accruals in the group where earnings are predicted to be managed upwards to the mean total accruals for each group where earnings are predicted to be managed downwards.

This approach is equivalent to treating the set of observations for which earnings are predicted to be managed upwards as the estimation period and the set of observations for which earnings are predicted to be managed downward as the event period. The mean of total accruals of the group where earnings are predicted to be managed upwards then represent the measure of nondiscretionary accruals. (Dechow et al. 1995.) This implies the following model for nondiscretionary accruals:

$$(2) \qquad EDAC_{i,t} = \frac{TAC_{i,t}}{A_{i,t-1}}$$

where:

$EDAC_{it}$ = Estimated discretionary accruals for firm i in year t;

TAC_{it} = Total accruals for firm i in year t;

A_{it-1} = Total assets for firm i at the beginning of year t.

The De Angelo Model

DeAngelo (1986) tests for earnings management by computing first differences in total accruals, and by assuming that the first differences have an expected value of zero under a null hypothesis of no earnings management. DeAngelo uses the last period's total accruals (scaled by lagged total assets) as the measure of nondiscretionary accruals. The DeAngelo model is similar to the Healy model in that the estimated period for nondiscretionary accruals was restricted to the prior year's observation. The DeAngelo model assumes that non-discretionary accruals follow a random walk and uses the change in the aggregate accruals from year t-1 to year t to represent the discretionary component. (Miller 2009) The formula for the DeAngelo model is:

$$(3) \quad EDAC_{i,t} = \frac{TAC_{i,t} - TAC_{i,t-1}}{A_{i,t-1}}$$

where:

$EDAC_{it}$ = Estimated discretionary accruals for firm i in year t,

TAC_{it} = Total accruals for firm i in year t,

A_{it-1} = Total assets for firm i at the beginning of year t

The De Angelo model can be viewed as a special case of the Healy Model. A common feature both models contain is that they both use total accruals from the estimation period to proxy for expected nondiscretionary accruals. Moreover, the major assumption of two models described above is that nondiscretionary accruals are constant over time. In such a way, in case if nondiscretionary accruals change over time, then both models tend to measure nondiscretionary accruals with error. However, assumption of constancy of nondiscretionary accruals over time is too strict and is unlikely to be empirically descriptive. Kaplan (1985) points out that the nature of accrual accounting process dictates that the level of nondiscretionary accruals should change in response to changes in economic circumstances.

The Jones Model

Jones (1991) had proposed a model that had relaxed the assumptions made by Healy and DeAngelo about constancy of nondiscretionary accruals over time. The Jones model, it is presumes that the level of unmanaged accruals is accounted for by: 1) gross property, plant, and equipment which determines depreciation expenses; 2)changes in revenues which specifies the changes in working capital. Her model had attempted to control for the effect of changes in a firm's economic circumstances on nondiscretionary accruals. Jones had made an implicit assumption that revenues are nondiscretionary. The formula for the Jones model is:

$$(4) \quad \frac{TAC_{i,t}}{A_{i,t-1}} = \alpha_{i1}\left(\frac{1}{A_{i,t-1}}\right) + \beta_{i1}\frac{\Delta REV_{i,t}}{A_{i,t-1}} + \beta_{i2}\frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t}$$

where:

TAC_{it} = Total accruals for firm i in year t,

A_{it-1} = Total assets for firm i at the beginning of year t,

ΔREV_{it} = Change in revenue for firm i from year t-1 to year t,

PPE_{it} = Gross property, plant, and equipment for firm i in year t.

All variables are deflated by beginning total assets to adjust for heteroscedasticity. An assumption implicit in the Jones model is that revenues are nondiscretionary. If earnings are managed through discretionary revenues, then the Jones Model will remove part of the managed earnings from he discretionary accrual proxy. Dechow et al. (1995) gives an example of situation where management uses its discretion to accrue revenues at the year-end when it is highly questionable whether the revenue has been earned. The result of this managerial discretion will be an increase in revenues and total accruals (through an increase in receivables). Thus, according to Dechow et al (1995), the Jones Model orthogonalizes total accruals, causing the estimate of earnings management to be biased toward zero.

The Modified Jones Model

Addressing the issue of error containing in measurement of discretionary accruals when discretion is exercised over revenues (in the Jones Model), Dechow et al. (1995) develops the model described above:

$$(5) \quad EDAC_{i,t} = \frac{TAC_{i,t}}{A_{i,t-1}} - a_{i1}\left(\frac{1}{A_{i,t-1}}\right) + b_{i1}\left(\frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}}\right) + b_{i2}\left(\frac{PPE_{i,t}}{A_{i,t-1}}\right)$$

where:

$EDAC_{it}$ = Estimated discretionary accruals for firm i in year t,

TAC_{it} = Total accruals for firm i in year t,

A_{it-1} = Total assets for firm i at beginning of year t,

ΔREV_{it} = Change in revenue for firm i from year t-1 to year t,

ΔAR_{it} = Change in accounts receivable for firm i from year t-1 to year t,

PPE_{it} = Gross property, plant and equipment for firm i in year t.

The major modification of the Jones Model is that the change in revenues is adjusted for the change in receivables in the even period. The modified version of Jones Model implicitly assumes that all changes in credit sales in the event period result from earnings management. According to Dechow et al.(1995), this is based on the reasoning that it is easier to manage earnings by exercising discretion over recognition of revenue on credit sales than it is to manage earnings by exercising the discretion over the recognition of revenue on immediate cash sales.

The Industry Model

Similar to the Jones Model, the model developed by Dechow& Sloan (1991), relaxes the assumption that nondiscretionary accruals are constant over time. Instead of attempting to directly model the determinants of nondiscretionary accruals, this model assumes that variation in the determinants of nondiscretionary accruals are common

across firms in the same industry. So, the Industry Model for nondiscretionary accruals is:

(6) $\quad NDA_\tau = \gamma_1 + \gamma_2 Median\left(TA_\tau\right)$

where:

median (TAτ) – the median value of total accruals scaled by lagged total assets for all non-sample firms in the same 2-digit SIC-code. The use of 2-digit SIC levels represents a trade-off between defining industry grouping narrowly enough that the Industry Model captures the industry specific effects versus having enough firms in each industry grouping so that the model can effectively diversify firm-specific effects. Firm specific parameters γ_1 and γ_2 are estimated using OLS on the observations in the estimation period.

According to Dechow et al. (1995), the ability of the Industry Model to mitigate measurement error in discretionary accruals hinges critically on two factors. First, the model only removes variation in nondiscretionary accruals that is common across firms in the same industry. If changes in nondiscretionary accruals largely reflect responses to changes in firm-specific circumstances, then the model will not extract all non-discretionary accruals from the discretionary accrual proxy. Second, the Industry Model removes variation in discretionary accruals that is correlated across firms in the same industry, potentially causing estimation problem. The severity of this problem depends on the extent to which the earnings management stimulus is correlated across firms in the same industry.

3.3. Evaluation of Major Models for Discretionary Accruals Estimation

Dechow et al. (1995) evaluated the relative performance of five earnings management measuring models described above taking specification and power as standards. The result indicate that the modified Jones model provides the most powerful test of earnings management.

Bartov, Gul, and Tsui (2000) evaluate the detecting ability of several different models by examining the association between discretionary accruals and audit qualifications. They claim that only the cross-sectional Jones and cross-sectional modified Jones model are consistently able to detect earnings management. Both the cross sectional Jones model and the cross-sectional modified Jones model are commonly adopted by most researchers. Chang et al. (2003) evaluate the cross-sectional Jones model and the time-series modified Jones model by examining the association between consecutive changes in insider holdings and earnings management, and indicate that cross-sectional Jones model is better than the other.

However, regarding Shiue and Lin (2004) who evaluate the five commonly cited discretionary accruals estimation models which are the same as Dechow et al. (1995), they conclude that the DeAngelo model and Healy model are better than the others in detecting earnings management, which is inconsistent with Dechow et al. (1995) and Bartov et al. (2000). One possible reason for this incongruity may be that the sample firms which are the distressed firms selected by Shiue and Lin (2004) are mainly from the electronics industry, which results in the minimal efficacy of the cross-sectional Jones model and the modified cross-sectional Jones model.

Summarizing, the results of testing the models against empirical data are controversial. Nevertheless, the cross-sectional Jones model remains one of the most popular detection models in literature related to earnings management as above-mentioned. The present study complies with the majority of previous studies and utilizes cross-sectional Jones model for analysis of earnings management.

4. DATA AND METHODOLOGY

4.1. Data Description

Final sample comprises the data of 102 Russian companies covering the period of the year 2007. Total accruals (and hence, discretionary accruals) are calculated using the *year-end* data for 2007 and represent the accruals made throughout the year. Influence of debt-to-equity ratio along with other control variables on discretionary accruals made during the year is tested utilizing the *beginning* of 2007 data for independent variables. This allows testing whether closeness to debt covenants violation at the beginning of the period appears to be an incentive for subsequently recorded discretionary accounting accruals.

The data were obtained from Thomson Financial Database and annual financial statements published at companies' websites. Financial ratios employed in analysis were calculated manually using corresponding data. It is necessary to note that some of financial figures presented in Thomson database substantially differ from the ones contained in financial statements of the companies at their official websites. This fact takes place presumably due to a significant number of restated financial statements which were not updated in the database. In cases of such discrepancies the data from financial statements were used for analysis.

Table 1 reports the distribution of sample firms by major industry groups. Each company was referred to the corresponding major industry groups based on the first 2 digits of their Standard Industrial Classification (SIC) code which was obtained from Thomson Financial Database. The codes are four digit numerical codes assigned by the U.S. government to business entities to identify the primary business of the establishment. This classification was developed to facilitate the collection, presentation and analysis of data; and to promote uniformity and comparability in the presentation of statistical data collected by various agencies of the federal government, state agencies and private organizations .The first two digits of the code identify the major industry group, the third digit identifies the industry group and the fourth digit identifies the industry (Charitou 2007).

In the framework of the present thesis it is reasonably enough to classify the companies in accordance with the major industry groups using the first 2 digits of the SIC code. As it is observed from the table below the sample is not heavily biased towards any particular industry and is almost evenly distributed among them. The largest number of the firms analyzed belongs to a)Communication and b)Electric/Gas/Sanitary Services. The companies of the above-mentioned major industry groups represent around one-third of the whole sample of 102 firms.

Table 1. Distribution of sample firms by major industry groups

First 2 digits of SIC code	Major Industry Group	Number of companies	Percentage in Total
28	Chemicals and Allied Products	6	5.9%
48	Communication	17	16.7%
49	Electric/Gas/Sanitary Services	16	15.7%
20,54,56,57,58	Food and Kindred Products	12	11.8%
10	Metal mining	7	6.9%
13	Oil and Gas Extraction	8	7.8%
87,31,21	Other	8	7.8%
12,29,51	Petroleum and Coal Products	8	7.8%
33,34,50	Primary Metal Industries	11	10.8%
37,44,45	Transportation Equipment	9	8.8%
	Total	**102**	**100%**

Table 2 presents distribution of major industrial groups by levels of leverage showing the percentage each major industrial group occupies in highly leveraged companies as well as in the remaining sample companies. Distinction of highly leveraged companies is performed based on individual debt-to-equity ratios of each company. In such a way, the firm is considered to be highly leveraged if its D/E ratio exceeds 0.6. The threshold is chosen based on the sample mean and distribution of D/E ratio presented in Section 4.3. Therefore, a dummy variable indicating the degree of leverage (DHL) is introduced in the analysis. According to histogram presented by Graph 1 and D/E distribution (Table XX), D/E ratio of most of the sample companies range from 0.310 to 0.931. Number of sample companies with D/E exceeding 0.6 (DHL=1) is 31 while with D/E below 0.6 (DHL=0) is 71.

In such a way, from the Table 2 it is observed that in highly leveraged part of the sample (DHL=1) 25.8% belong to Communication major industry group. Those are followed by Transportation Equipment and Other industries occupying 16.1% each, and Food and Kindred Products constituting 12.9% of the highly leveraged companies in the sample. The above listed industry groups compose 71% of highly leveraged sample companies. In less leveraged companies (DHL=0) Electric/Gas/Sanitary Services and Primary Metal Industries hold the largest shares of 18.3% and 15.5%, respectively.

Table 2. Distribution of major industrial groups by levels of leverage.

DHL=1 for the companies with D/E ratio exceeding 0.6; DHL=0 if otherwise. The threshold of 0.6 is chosen based on the sample mean and distribution of D/E ratio (see Table3, Table 4).

Major Industry Group	Number of companies		Percentage in Total	
	DHL=1	*DHL=0*	*DHL=1*	*DHL=0*
Chemicals and Allied Products	1	5	3.2%	7.0%
Communication	8	9	25.8%	12.7%
Electric/Gas/Sanitary Services	3	13	9.7%	18.3%
Food and Kindred Products	4	8	12.9%	11.3%
Metal mining	3	4	9.7%	5.6%
Oil and Gas Extraction	1	7	3.2%	9.9%
Other	5	3	16.1%	4.2%
Petroleum and Coal Products	1	7	3.2%	9.9%
Primary Metal Industries	0	11	0.0%	15.5%
Transportation Equipment	5	4	16.1%	5.6%
Total	31	71	100%	100%

4.2. Data selection principles

Thomson Financial Database contains the data for 211 Russian companies all of which constituted the initial sample of the present research. However, the below-listed selection procedures had reduced the size of the final sample to 102 companies. Following the tradition of previous research, the final sample was selected in accordance with the following principles:

1) Banks and financial institutions (SIC-codes 6000-6999) were excluded from the initial sample because of their specific accounting requirements, which differ

substantially from those of industrial and commercial companies and which prevent them from freely selecting the accounting standards to apply;

2) Final sample does not include companies with zero long-term debt which allows the analysis staying in line with the purpose of the study;

3) Companies with missing data on any of the required for the analysis variables were excluded from the sample. Such firms were expelled if the data could not be found via both sources: Thomson Financial Database and the companies' official websites;

4) The sample does not include the firms with negative Equity;

5) After performing the first step of analysis (see Eq.(7)) , observations with discretionary accounting accruals exceeding 100% of lagged total assets (observations with regression residual above 1) are excluded from further testing.

4.3. Research Methodology

It is essential to distinguish 2 steps of the analysis carried in the present study. Initially there is a need in estimating discretionary accruals which is performed using cross-sectional Jones (1991) model. Afterwards, in order to test the validity of debt covenants hypothesis, discretionary accruals are regressed against debt-to-equity ratio and a set of control variables. Thus, two regression equations are performed in order to achieve the aim of research. The first step of the analysis derives discretionary accounting accruals, thus estimating earnings management. Discretionary accruals method is the most broadly accepted method for measurement of earnings management in the previous researches. It states that managers rely on their ability to use discretion regarding certain accruals and thus requires discretionary and non-discretionary components of accruals to be separated, so that the discretionary accruals can be used as proxy to test for earnings management.

Discretionary accruals are calculated in the present study utilizing cross-sectional Jones (1991) model, which is commonly used by the extant body of research. Under the Jones model, it is assumed that the level of unmanaged accruals is accounted for by gross property, plant, and equipment, and changes in revenues. The former determines the depreciation expense while the latter determines the changes in working capital. These two variables are used for regression, the residuals of which are considered the managed accruals. Hence, discretionary accruals are estimated as residuals (DAC) of the following regression model:

$$(7) \quad \frac{TAC_{i,t}}{A_{i,t-1}} = \alpha_{i1}\left(\frac{1}{A_{i,t-1}}\right) + \beta_{i1}\left(\frac{\Delta REV_{i,t}}{A_{i,t-1}}\right) + \beta_{i2}\left(\frac{PPE_{i,t}}{A_{i,t-1}}\right)$$

where:

TAC_{it} = Total accruals scaled by lagged by total assets for firm i in year 2007, calculated as the difference between net income and operating cash flows divided by total assets at the beginning of 2007 (Jaggi & Lee 2002).

A_{it-1} = Total assets for firm i at the beginning of year 2007,

ΔREV_{it} = Change in revenue for firm i from year 2006 to year 2007,

PPE_{it} = Gross property, plant, and equipment for firm i in year 2007,

$\varepsilon_{it=}$ Residuals of the Eq. (7) are discretionary accruals. They are used as a proxy for earnings management estimation. Therefore, to test the effect of debt-to-equity ratio and other control variables on earnings management, discretionary accruals are employed as a dependent variable in the second regression model.

As noted in Section 3.2. of the present research, total accounting accruals can also be estimated using an alternative method which derives the value of TAC from balance sheet items (see e.g., Iatridis, G. & G. Kadorinis 2009; Jones 1991) . In this case TAC is calculated as change in non-cash current assets minus change in current liabilities (excluding short-term debt and income tax payable) minus depreciation; the result is divided then by lagged total assets. Both of the methods are used by the researchers in the area of earnings management study.

The second step of analysis strives to achieve the purpose of the study. Here discretionary accruals are regressed towards factors found to have influence on earnings management in previous research. The factors were selected in accordance with the frequency of similar studies and availability of data for Russian market. Association between debt covenants violation and discretionary accruals is examined in the present study utilizing OLS regression. As evaluation of closeness to debt covenants violation from each credit agreement is impossible due to unavailability of data, it is proxied by debt-to-equity ratio (see e.g. Darrough et al. 1998). The latter is calculated as long-term debt divided by total equity.

To control for differences in earnings management incentives, the model includes variables of size, profitability, stock valuation and liquidity. First, natural logarithm of total assets (LnTA) proxies for the size of a company, which itself is a proxy variable for political attention (Watts and Zimmerman, 1990). Profitability is accounted for by operating profit margin (OPM) calculated as earnings before income tax divided by total turnover. Capital market incentives are controlled by price-to-book ratio (P/B) which is estimated as market capitalization divided by the difference between total tangible assets and total liabilities. Current ratio (CR) of current assets divided by current liabilities controls for need in cash.

Finally, dummy variable for highly leveraged companies (DHL) is introduced. The variable is aimed to test the degree of leverage as an incentive for earnings management. DHL=1 if D/E is greater than 0.6; DHL=0 if otherwise. The threshold of 0.6 was chosen based on the sample mean of D/E ratio (please refer to Table 3). According to histogram depicted by Graph 1 and D/E distribution presented in Table 4, D/E ratio of 80% (82 out of 102) sample companies range from 0.31 to 0.93. Threshold for identification of high leverage equal to 0.6 is set slightly exceeding the sample mean of D/E ratio which is 0.56 and fits in the above stated interval. Number of sample companies with D/E exceeding 0.6 (DHL=1) is 31 while with D/E below 0.6 (DHL=0) is 71.

All the independent variables included are calculated for the beginning of the year 2007 to examine their impact to influence managers' incentives to modify earnings

subsequently during the year. The table below represents descriptive statistics for the variables of Eq (8):

Table 3. Descriptive Statistics of the sample (n=102).

Parameter	Mean	Standard Error	Median	Standard Deviation	Min	Max
Discretionary Accruals, t	0.00	0.12	-0.10	1.25	-0.35	0.06
Debt to equity ratio, t-1	0.56	0.07	0.33	0.67	0.01	3.10
Ln (Total Assets), t-1	10.39	0.17	10.42	1.76	5.27	15.49
Operating Profit Margin, t-1	0.23	0.02	0.19	0.22	0.00	1.68
Price to book ratio, t-1	3.96	0.47	2.39	4.70	0.21	28.42
Current ratio, t-1	1.98	0.19	1.47	1.87	0.17	11.92

Table 4. Distribution of D/E ratios in sample companies.

Interval	Frequency	% of total
0.01	1	0.98%
0.31	**48**	**47.06%**
0.62	**22**	**21.57%**
0.93	**12**	**11.76%**
1.24	5	4.90%
1.55	3	2.94%
1.86	4	3.92%
2.17	3	2.94%
2.48	1	0.98%
2.79	1	0.98%
More	2	1.96%
Total	**102**	**100%**

Graph 1. Distribution of D/E ratio at the beginning of 2007 in sample companies.
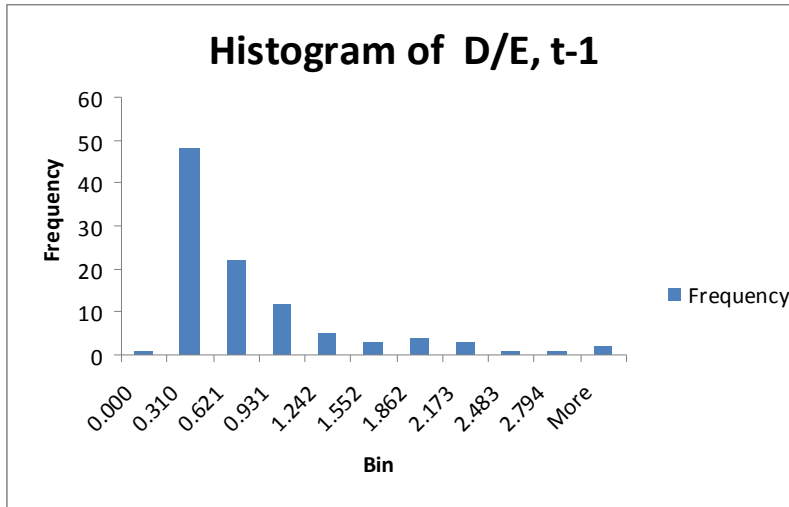
The regression equation for the second step of analysis therefore takes the following form **Eq. (8)**:

$$(8) \quad DAC_{i,t} = a_0 + a_1 \left(\frac{D_{i,-1}}{E_{i,t-1}} \right) + a_2 LnTA_{i,t-1} + a_3 OPM_{i,t-1} + a_4 \left(\frac{P_{i,t-1}}{B_{i,t-1}} \right) +$$
$$+ a_5 CR_{i,t-1} + a_6 DHL_{i,t-1} + \varepsilon_{i,t}$$

where:

DAC_{it}= Discretionary accounting accruals estimated as residuals of **Eq. (7)**

$D/E_{i,t-1}$ = Debt-to-equity ratio at the beginning of 2007. (Long-term debt divided by total equity)

$LnTA_{i,t-1}$= Natural logarithm of total assets at the beginning of 2007

$OPM_{i,t-1}$= Operating profit margin at the beginning of 2007. (Earnings before income tax divided by turnover)

$P/B_{i,t-1}$=Price to book ratio at the beginning of 2007. (Market capitalization divided by the difference between total tangible assets and total liabilities)

$CR_{i,t-1}$=Current ratio at the beginning of 2007. (Current assets divided by current liabilities)

DHL $_{i,t-1}$=Dummy variable for highly leveraged companies. DHL $_{i,t-1}$=1 if D/E $_{i,t-1}$ is greater than 0.6; DHL $_{i,t-1}$=0 if otherwise. The threshold of 0.6 was chosen based on the sample mean of D/E ratio.

4.4. Hypotheses

The present section lists testable hypotheses based on the relationships between earnings management and its major motivating factors established by empirical research. The factors affecting earnings management were divided into the groups depending on the corresponding underlying hypothesis stated in the previous studies. In such a way, debt covenants hypothesis (H1) contains an assumption about influence of debt-to-equity ratio (D/E) and Dummy for highly leveraged companies (DHL) on earnings management. Controlling variables are also referred to the corresponding hypotheses. Thus, political cost hypothesis (H2) makes an inference about the effect of the company's size (LnTA) and profitability (OPM) on earnings management while H3 which is related to capital market incentives assumes the specific relation of market stock valuation (P/B) and Current ratio (CR) with earnings management. The hypotheses are examined using the data and models described in the previous sections. Particularly, the impact of the factors are examined by means of running Eq. (8).

Debt covenants hypothesis is a central concept of the present study. It assumes that in a 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 alter reported earnings. Specifically, the higher the firm's debt/equity ratio, the more likely managers are to use income-increasing accounting methods exercised by means of discretionary accounting accruals. Section 2.2 of the study reveals the two-fold results of the previous research on debt covenants hypothesis. Since the concept has found a considerable empirical support as well as disproof both of the below stated hypotheses have the equal right to exist.

H1$_0$. Under the *debt covenants hypothesis* discretionary accounting accruals (DAC) are expected to be positively associated with debt-to-equity ratio (D/E) which is a proxy for

closeness to debt covenants violation. Positive correlation is also anticipated to appear between DAC and a dummy variable for highly leveraged companies (DHL).

$H1_a$. Alternatively, discretionary accounting accruals (DAC) are expected have a negative relationship with debt-to-equity ratio (D/E). Negative correlation is also anticipated to appear between DAC and a dummy variable for highly leveraged companies (DHL).

Political cost hypothesis assumes that the larger the firm, the more likely the managers are to choose accounting procedures that defer reported earnings from current to future periods as larger and more profitable firms attract more attention of the governmental bodies. In such a way, firms are expected to manage their earnings downwards in order to lower their political risk. Two variables account for political cost hypothesis in the present study:

$H2$. Under *political cost hypothesis*, discretionary accounting accruals (DAC) are expected to be negatively associated with total assets (LnTA) which is a proxy for size and profitability (OPM).

In attempts to sustain or increase the stock prices, companies tend to manage their earnings upwards to seem more attractive and profitable to potential investors. In such a way, lower stock valuation is to cause higher discretionary accruals. Stock valuation is proxied by price-to-book ratio. Prior to obtaining additional financing the company is likely to present its performance and financial position in a favorable light to potential investors. This implies that need in financing (e.g., cash resources) creates incentives for companies to manage earnings upwards. Current ratio proxies for need in cash resources in the present study. Therefore it is hypothesized that:

$H3$. Discretionary accounting accruals (DAC) are negatively correlated with market stock valuation (P/B) and Current ratio (CR).

5. EMPIRICAL RESULTS

The present section demonstrates empirical results obtained by performing analytical procedures described in Section 4. Table 5 provides correlation coefficients among independent variables. Correlation analysis is performed with the purpose of possible multicollinearity identification. Multicollinearity is referred to as a high correlation among the independent variables of the model. A sample correlation coefficient greater than 0.7 or less than -0.7 for two independent variables is a rule of thumb indicating potential multicollinearity issue (Anderson, Sweeney & Williams 2009: 644-646).

Table 5. Pearson correlation between independent variables

	D/E, t-1	LnTA, t-1	OPM, t-1	P/B, t-1	CR, t-1	DHL
D/E, t-1	1					
LnTA, t-1	-0.24	1				
OPM, t-1	-0.20	0.19	1			
P/B, t-1	0.34	-0.12	-0.11	1		
CR, t-1	0.18	0.07	0.44	-0.13	1	
DHL, t-1	0.65	-0.21	-0.08	0.29	-0.20	1

As Anderson et. al (2009: 644-646) claim, in the presence of multicollinearity, the confidence intervals of the coefficients tend to become very wide and the statistics tend to be very small, p-values may be misleading. Thus, it becomes difficult to reject the null hypothesis of any study when multicollinearity exists. As the regression coefficients' confidence intervals are likely to be wide, they may vary with the addition or exclusion of just one variable. If this is the case, removing any highly correlated terms from the model will substantially affect the estimated coefficients. Multicollinearity inflates the variances of the parameter estimates and is likely to result in high standard errors.

Based on the correlation coefficients presented in the table above a relatively high correlation of 0.65 is observed between D/E ratio and dummy variable for highly leveraged companies (DHL). The fact follows the common sense as DHL is set in accordance with D/E threshold. The remaining correlation coefficients being relatively low do not appear to be potential multicollinearity indicators. According to Albright,

Winston & Zappe (2008: 660-662), multicollinearity does not in general violate OLS assumptions and cause poor predictions. Rather, it may result in too low t-values and too high p-values which may lead to lack of statistical significance of individual independent variables even though the overall model may be significant. One of the indicators of multicollinearity is the case if the individual outcome of a statistic is not significant but the overall outcome of the statistic is significant. Whether the above holds true in the context of the present analysis, is examined below.

Table 6. Regression results. Eq. (8): Initial Model.

Debt-to-equity ratio (D/E_{t-1}) is computed as long-term debt divided by total equity. Size of the company ($LnTA_{t-1}$) is measured by natural logarithm of total assets; profitability (OPM_{t-1}) is calculated as earnings before income tax divided by turnover. Stock valuation variable (P/B_{t-1}) is a price-to-book ratio estimated as market capitalization divided by the difference between total tangible assets and total liabilities. Current ratio (CR_{t-1}) is computed as current assets divided by current liabilities. Dummy variable for highly leveraged companies (DHL_{t-1})=1 if $D/E_{i,t-1}$ is greater than 0.6; DHL_{t-1}=0 if otherwise. The threshold of 0.6 for DHL_{t-1} was chosen based on the sample mean and distribution of D/E ratio. All independent variables represent the data for the beginning of 2007.

Parameter	*Coefficient*
Intercept	0.56
	(0.80)
D/E, t-1	-0.73*
	(0.43)
LnTA, t-1	-0.09
	(0.07)
OPM, t-1	0.36
	(0.65)
P/B, t-1	0.04
	(0.03)
CR,t-1	-0.13**
	(0.07)
DHL, t-1	-0.31*
	(0.22)
Adjusted R-Square	0.15
Observations	102

* and **denote coefficients significant at 10% and 5% respectively. Standard errors are reported in parentheses.

Table 6 summarizes the results of regression of discretionary accounting accruals (DAC) against major influence factors. DAC are estimated as residuals of Eq.(7). Following the practice of previous empirical research, observations with DAC exceeding 100% of lagged total assets were removed. In other words, observations with residual above 1 in absolute value were excluded from the further analysis. As it is observed from the Table 6, both of the variables under debt covenants hypothesis which are debt-to-equity ratio (D/E) and Dummy for High Leverage (DHL) appear to be significant in explaining DAC. The sign of the influence of the factors is consistent with the alternative version of debt covenants hypothesis ($H1_0$) stated in Section 4.4. Thus, a negative effect of D/E and DHL on DAC is discovered by means of running Eq. (8). Both of the independent variables are statistically significant at 10% level.

Out of four controlling variables employed in the model only current ratio (CR) at the beginning of the period was found to be significant in explaining discretionary accounting accruals recorded subsequently throughout the year. The influence of this factor is negative implying the reverse relationship. Thus, lower current ratio a company has at the beginning of the year leads to income-increasing accounting accruals. The controlling variable is statistically significant at 5% level.

Even though both of the variables are found to be statistically significant there is a possibility that collinearity issue affects regression results. Due to comparatively high correlation between debt-to-equity ratio (D/E) and dummy for highly leveraged companies (DHL) as shown in Table 5 it may be appropriate to carry further analysis with the aim of possible improvement of the model, and consequently, regression parameters. In order to eliminate the impact of correlation between the two variables on the overall output, two additional regressions are performed: each excluding one of the variables.

In such a way, Eq. (9) contains all explanatory variables employed in the initial model expressed by Eq. (8) apart from Dummy for Highly Leveraged Companies (DHL), whereas Eq. (10) includes all factors of Eq.(8) except debt-to equity ratio (D/E). The procedure adjusted for collinearity issue is expected to increase individual significance of the coefficients for the correlated variables as well as overall goodness of fit of the

model measured by R^2. The results of performing regressions expressed by Eq. (9) and Eq. (10) are summarized in Table 7 and Table 8, correspondingly.

$$(9) \quad DAC_{i,t} = \beta_0 + \beta_1 \left(\frac{D_{i,-1}}{E_{i,t-1}} \right) + \beta_2 LnTA_{i,t-1} + \beta_3 OPM_{i,t-1} + \beta_4 \left(\frac{P_{i,t-1}}{B_{i,t-1}} \right) + \\ + \beta_5 CR_{i,t-1} + \varepsilon_{i,t}$$

Table 7. Regression results. Eq. (9): Excluding Dummy variable for highly leveraged companies (DHL).

Debt-to-equity ratio (D/E_{t-1}) is computed as long-term debt divided by total equity. Size of the company ($LnTA_{t-1}$) is measured by natural logarithm of total assets; profitability (OPM_{t-1}) is calculated as earnings before income tax divided by turnover. Stock valuation variable (P/B_{t-1}) is a price-to-book ratio estimated as market capitalization divided by the difference between total tangible assets and total liabilities. Current ratio (CR_{t-1}) is computed as current assets divided by current liabilities. All independent variables represent the data for the beginning of 2007.

Parameter	*Coefficient*
Intercept	0.53
	(0.45)
D/E, t-1	-0.52**
	(0.20)
LnTA, t-1	-0.08
	(0.07)
OPM, t-1	0.23
	(0.64)
P/B, t-1	0.04
	(0.03)
CR,t-1	-0.14**
	(0.07)
Adjusted R-Square	0.21
Observations	102

* and **denote coefficients significant at 10% and 5% respectively. Standard errors are reported in parentheses.

$$(10) \quad DAC_{i,t} = \gamma_0 + \gamma_1 LnTA_{i,t-1} + \gamma_2 OPM_{i,t-1} + \gamma_3 \left(\frac{P_{i,t-1}}{B_{i,t-1}} \right) + \gamma_4 CR_{i,t-1} +$$

$$+ \gamma_5 DHL_{i,t-1} + \varepsilon_{i,t}$$

Table 8. Regression results. Eq. (10): Excluding Debt-to-Equity Ratio (D/E).

Size of the company (LnTA $_{t-1}$) is measured by natural logarithm of total assets; profitability (OPM$_{t-1)}$ is calculated as earnings before income tax divided by turnover. Stock valuation variable (P/B$_{t-1}$) is a price-to-book ratio estimated as market capitalization divided by the difference between total tangible assets and total liabilities. Current ratio (CR$_{t-1}$) is computed as current assets divided by current liabilities. Dummy variable for highly leveraged companies (DHL$_{t-1}$)=1 if D/E $_{i,t-1}$ is greater than 0.6; DHL$_{t-1}$=0 if otherwise. The threshold of 0.6 for DHL$_{t-1}$was chosen based on the sample mean and distribution of D/E ratio. All independent variables represent the data for the beginning of 2007.

Parameter	Coefficient
Intercept	0.44
	(0.52)
LnTA, t-1	-0.08
	(0.07)
OPM, t-1	0.39
	(0.63)
P/B, t-1	0.04
	(0.03)
CR,t-1	-0.13**
	(0.07)
DHL, t-1	-0.33
	(0.20)*
Adjusted R-Square	0.17
Observations	102

* and **denote coefficients significant at 10% and 5% respectively.
Standard errors are reported in parentheses.

Results presented in Table 7 suggest that exclusion of DHL from the initial model (Table 6) results in higher significance level for D/E variable. Standard error and p-value for debt-to-equity ratio decreased. In the adjusted model D/E is significant at 5%

level in contrast to initial model incorporating both of the variables, where the D/E was found to be significant only at 10% level. Indicator of the overall model fittability which is measured by Adjusted R-Square has improved from 0.15 to 0.21. Out of controlling variables, only Current Ratio remains significant at unchanged 10% level.

According to the Table 8, as a result of dropping D/E from the initial model, Adjusted R-Square has slightly increased from 0.15 to 0.17. However, Dummy for Highly Leveraged Companies remains at 5% significance level in explaining DAC recorded during 2007 likewise found in the initial model. Although standard error and p-value have slightly decreased, the magnitude of change in p-value is not enough to conclude on the increase in significance level of the variable. In the model not containing D/E, Current Ratio remains significant at unchanged 10% level.

Summarizing, the major findings of all three models are in line with each other although the results obtained from the adjustments of the model allow concluding about a slight degree of multicollinearity between D/E and DHL as regression parameters improve to a small extent in adjusted equations. Thus, D/E and DHL which are the variables of the focus of the present study are discovered to be significant in explaining discretionary accounting accruals. The influence sign is negative which is consistent with the alternative to debt covenants hypothesis stated in Section 4.4. Out of four controlling variables only Current Ratio has explanatory power over DAC with the negative influence sign as expected by H3.

The results obtained imply that higher Debt-to-Equity ratio creates incentives for managers of the borrowing companies to use income decreasing discretionary accruals which is aimed to present a company in a less favorable position. Such policies are applied with the hope of getting reliefs and more favorable conditions in loan agreements from the lenders. Negative impact of dummy variable for highly leveraged companies corroborates this suggestion. The inverse relationship between Current Ratio which proxies for a need for cash resources and DAC means that companies with lower liquidity requiring additional financing particularly in a form of cash manage their earnings upwards. Table 9 presents comparison of the results obtained by the present study against the hypothetical relationships.

Table 9. Comparison of Theoretical Assumptions and Actual Results for the relationship between Discretionary Accounting Accruals and Explanatory variables

Explanatory variable	Theoretical Assumptions	Practical results
Debt to equity ratio, t-1	Positive/Negative (alternative)	Negative
Ln (Total Assets), t-1	Negative	Not significant
Operating Profit Margin, t-1	Negative	Not significant
Price to book ratio, t-1	Negative	Not significant
Current ratio, t-1	Negative	Negative
Dummy Highly leveraged	Positive/Negative (alternative)	Negative

6. SUMMARY AND CONCLUSIONS

The study aims to establish the relationship between closeness to debt covenants violation and earnings management. The association is tested through the concept of debt covenants hypothesis which assumes that in reluctance of being subject to fines and penalties for non-compliance with debt covenants specified in loan agreements, managers of the borrowing firms tend to alter reported earnings. Specifically, the higher the firm's debt-to-equity ratio, the more likely managers are to use income-increasing accounting methods exercised by means of discretionary accounting accruals. Since the concept has found a considerable empirical support as well as disproof, the present study adds an alternative hypothesis assuming the inverse relationship between debt-to-equity ratio and earnings management.

Following the practice of previous empirical research, debt-to-equity ratio is utilized as a proxy for closeness to debt covenants violation and discretionary accounting accruals are used as a proxy for earnings management. The analysis includes an additional variable which accounts for the impact of the degree of leverage on discretionary accruals. In the present work, discretionary accounting accruals are estimated by Jones (1991) model. The model is recognized as one of the most appropriate among all existing and is most widely used by the researchers in the area. It assumes that managers rely on their ability to use discretion regarding certain accruals and thus requires discretionary and non-discretionary components of accruals to be separated, so that the discretionary accruals can be used as proxy to test for earnings management. The study examines the validity of debt covenants hypothesis on the sample of 102 Russian companies for the year of 2007.

To control for differences in earnings management incentives, the model includes variables of size, profitability, stock valuation and liquidity. The factors were selected in accordance with the frequency of similar studies and availability of data for Russian market. The influence of size and profitability on earnings management is conveyed by political size hypothesis while the impact of stock valuation and liquidity refers to

capital market incentives. Both of the concepts have been subject to a substantial amount of previous research.

The results obtained by the present study suggest that both of the variables under debt covenants hypothesis which are Debt-to-Equity ratio and Dummy for High Leverage appear to be significant in explaining discretionary accounting accruals. The relationship is inverse as assumed by the alternative to debt covenants hypothesis. Similar results supported by reasonable explanations have been obtained by previous researchers as well (see e.g., De Angelo 1994; Jaggi&Lee 2002; Darrough, Pourjalali& Saudagaran 1998; Becker et al. 1998). For instance, DeAngelo et al. (1994) prove that the managers of firms with and without binding covenants engage in significant negative abnormal accruals, interpreting these findings to suggest that managers of financially troubled firms would highlight the firm's financial difficulties by reducing the reported earnings so that they could obtain better terms in their contract renegotiations.

Based on the rationales for similar results indicated in the previous studies, it is suggested that sample companies of the present study utilize analogous reasoning when making accounting decisions. Thus, higher Debt-to-Equity ratio creates incentives for managers of the borrowing companies to use income decreasing discretionary accruals which is aimed to present a company in a less favorable position. The major expectation from applying such policies is getting reliefs and less restrictive conditions in loan agreements from the lenders. Negative impact of dummy variable for highly leveraged companies corroborates this idea.

The only control variable found to have an explanatory power over discretionary accruals is current ratio. Negative influence sign corresponds to the one hypothesized and implies that lower current ratio results in income-increasing discretionary accruals. The rationale is similar to the ones indicated in previous studies of earnings management prior to obtaining additional investments (see e.g., Teoh, Wong & Rao 1998; Roosenboom et.al 2003; Rangan 1998). Results of the above mentioned studies entail that earnings management is used to increase income and therefore show the firm to be more profitable, in order to make investors more willing to invest money in the

firm. As current ratio proxies for a need for cash resources in the present study, it is suggested that companies with lower liquidity requiring additional financing particularly in a form of cash manage their earnings upwards. The results are robust after adjusting the model for the impact of correlation between Debt-to-Equity ratio and Dummy for Highly Leveraged Companies. Moreover, excluding each of the variables alternately from initial model improved regression parameters, particularly, significance level of Debt-to-Equity ratio and overall goodness of the model fit.

The study is possible to extend in a number of ways. As mentioned, previous empirical research identified the factors besides the ones considered in the present work which cause managers altering the reported earnings. Among those are: meeting dividend threshold, auditors' competence and quality, type and frequency of analysts' coverage etc. Thus, to control for other incentives for earnings management it is suggested to include any or all of the above listed variables.

Another area for further studies is performing more profound analysis by means of considering closeness to debt covenants violation in details rather than just examining debt-to-equity ratio as it is merely accepted in the extant literature. For instance, the study may consider a number of the covenants most frequently used in loan agreements, listed e.g., by Gopalakrishnan (1994). Such covenants include: (1) maintenance of minimum working capital, tangible net worth, quick ratio etc; (2) restrictions on investments and acquisitions, pledging certain assets; (3) Restrictions on incurring additional indebtedness; (4) Restrictions on incurring additional capital expenditures; (5) Restrictions on the ability of the firm to encumber its assets or engage in certain transactions outside the normal course of business; and so on. However, it should be noted that such kind of analysis requires a direct access to loan agreements which may be not feasible for some markets.

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APPENDIX

Earnings Management: Conditions and Incentives

Condition	Incentive
Earnings are somewhat short of the consensus earnings forecast in the market	To avoid potentially sharp drop in share price
A firm is preparing for an initial public offering of its share	To present the best possible earnings picture so as to maximize the price at which the issue is sold
Earnings are just above the minimum level required to earn incentive compensation, or close to exceeding the maximum beyond which no additional incentive compensation is earned	To cause earnings to remain between the minimum and maximum earnings level so as to maximize incentive compensation
A firm, either because of size or industry membership, or both, is a potential target for adverse political activity	To minimize the political costs of size and/or industry membership by avoiding what might be considered excessive profit levels
A firm is close to violation of an earnings related financial covenant in a credit or debt agreement	To avoid the potential adverse effects of a covenant violation, for example, an interest rate increase, a demand for security or immediate repayment
Earnings are either somewhat above or below a long-term trend believed by management to be sustainable	To avoid an improper market response to earnings being temporarily off trend
Earnings volatility is induced by a series of nonrecurring items	To reduce earnings volatility so that a valuation penalty, associated with a perceived higher level of risk, is not assessed
A change in the top management of the firm has taken place	To take large write-offs immediately upon the arrival of new management, relieving future results of the charges and permitting blame to be assigned to outgoing management
Large losses associated with restructuring and related charges have been accrued in the past	To reverse any overstated portion of the accruals in order to achieve earnings goals in later periods

Source: Mulford & Comiskey (2002:61)