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The Quality of Accruals: Lender Side Evaluation of Borrowers, Covenant Analysis, and Current Evaluation Trends

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Thesis submitted to Durham University in partial fulfillment of the requirement for the degree of 'Doctor of Philosophy' in Accounting

Abstract

Debt Covenant Hypothesis states that managers of borrowing firms may act in an opportunistic manner to avoid a potential breach of loan covenants set by lenders. Following evidence of earnings manipulation from prior research, this research analyses whether lenders can evaluate the exposure to risk and managerial opportunism, processing available information related to the borrowers. Earnings can be decomposed into cash flows and accrual components; where cash flows relate to the movement of tangible liquid assets and are less prone to manipulation, discretion can be exercised by firm management over the treatment of accruals. This research tests the accrual component of earnings for consistency and quality. If lenders are sophisticated users of financial information and take all the information in a borrower's earnings into account, a negative (positive) relationship is expected between the quality of accruals of the borrower, and tightness of minima (maxima) based financial covenant thresholds and slack.

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Declaration

I hereby declare that the material contained in this thesis has not previously been submitted for a degree in this, or any other institution. I further declare that this thesis is based on my own research.

Statement of Copyright

The copyright of this thesis rests with the author. No quotation from it should be published without the author's prior written consent. Any information derived from it should be properly acknowledged.

Dedications

To every parent, carer and guardian who has struggled mentally, and financially during the uncertainties arising from the corona pandemic. As the saying goes, there's light at the end of the tunnel, yet.

&

To my most wonderful children, and amazing family.

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1. Introduction

This research is related to the Debt Covenant Hypothesis and its opportunistic perspective. Focus will be on the lender-borrower relationship, analyzing whether lending institutions make implicit use of all available financial information while evaluating borrower firms.

Generally Accepted Accounting Principles (GAAP) are seen as an aide to transparency in financial accounting reporting. The broad categories covered by GAAP are the financial position of companies (Balance Sheet), their earnings for a time period (Income Statement), and the movement of cash and cash equivalents during a certain time period (Cash Flow Statement). But the inherent flexibilities that are present in GAAP, which allows firms to choose between numerous accounting techniques for a set of activities, poses challenges and the possibility of opportunism. For example, if a firm chooses to switch from LIFO (Last in First Out) system for inventories, to the FIFO (First in First Out) method, it can portray an artificial increase in gross profits. Managers may use legal accounting techniques to show a certain desired image of the company. This may lead to information that does not provide a true financial position of the firm.

Borrowing firms are inclined towards showing strong company financials, to secure better credit terms from lenders. Lenders' evaluations of borrowers, and the corresponding credit terms that are set serve as potential benchmarks for the market as a whole (Petersen, 1999. Behery et al., 2010). Banks, and financial institutions are considered to be efficient and effective in monitoring and controlling borrowers (Petersen, 1999). Financial intermediaries are also theorized to be performing their duties not only in their own interests and profitability, but on behalf of other stakeholders and investors as well (LeLand and Pyle, 1977. Diamond, 1984).

Stakeholders are becoming more aware of the need for reliable information, to better assess the financial performance of firms. Users of this information have been pushing for additional supplemental reports as addendums to financial statements, to make correct economic, and informed decisions. The communication of timely and relevant information about the company's profile to its stakeholders allows users to evaluate shares properly, enhances liquidity of the shares[1], and reduces the cost of capital (Epstein and Buhovac, 2006. Ethridge

[1] Lower price fluctuations, and bid-ask spreads.

and Marhs, 2010). The inefficiencies and inadequacies in the provision of such information leads to information risk, with significant implications. Incorrect household economic and investment decisions, over and undervaluation of share prices leading to bubbles, illiquidity of assets resulting in cash crunches, investors' erosion of trust in capital markets are a few examples. Lenders are also faced with higher credit risks, which may result in the loss of the principal amount, interest receivable, volatility of cash flows, and incremental collection costs.

In today's age, the continuous reporting of financial information has been mandated by regulatory bodies such as the SEC and has been feasible for both investors as well as the reporting corporations. Annual reports like Form 10-K, quarterly reports such as Form 10-Q, and event-related reports such as Form 8-K, all provide stakeholders the opportunity to adapt to organizational changes quickly. This helps them make appropriate investment decisions when the information is disclosed, and then evaluate those earlier decisions considering the subsequent periodic reports (Rowe, 2015).

The demand for periodic reporting of a company's earnings give rise to a very important aspect of financial accounting, in the form of accruals. This is defined by the relation:

$$Earnings = Cash\ Flows + \Delta Accruals$$

Some cash flows do not pass through the earnings statement in the period in which they are paid or received. Cash outflows (inflows) that are anticipated to bring benefits (obligations) other than in the period of payment (receipt), are accrued on the Balance Sheet. For example, consider the prepayment of rent for an entire year, at the start of the company's fiscal year. This creates a cash outflow[2] for the full amount in the first month of the fiscal year, which is then reduced by the monthly rent amount at the end of each month. Other examples include credit sales, purchases on credit, depreciation etc.

Lenders use financial reporting to be able to gauge the volatility of future cash flows of a borrower. Borrowers may choose to raise capital from a diffuse lender base. This often gives rise to the free riding problem; some of the benefits of monitoring by one lender may be passed on to another lender, resulting in reduced incentives to oversee borrowers. Information inefficiency in the market may arise when lenders fail to monitor and evaluate all the financial

[2] Prepayments of expenses create an asset, which is why they are listed on the balance sheet.

information about a borrower that is available to them[3]. According to Rajan and Winton (1995) to increase the incentives for lenders to monitor their borrowers, and to safeguard the interests of lenders themselves, loan covenants should be added to contract designs.

Loan covenants are legal binding agreements on borrowers, most of which are based on the financial performance of the firm. They impose conditions on borrowers in terms of financial variable thresholds, breach of which constitutes technical default of loan contracts. Examples are lenders requiring borrowers to maintain a specific *minimum* Current Ratio, *minimum* Quick Ration, *minimum* Interest Coverage Ratio; and *maximum* Debt to Earnings Ratio, *maximum* Leverage Ratio, and *maximum* Debt to Tangible Net Worth Ratio.

Lenders monitor the financial health of the borrowing firm in accordance with the loan covenants that have been written into loan contracts. These instruments (covenants) are analogous to financial options, with exercise 'prices' equal to the thresholds that have been set for a particular financial variable. A technical default, which is the violation of a covenant resulting from crossing the set financial variable threshold, allows intervention by the lender to secure its position when the covenant variable signals potential financial distress.

When an agent of a company uses the flexibilities in accounting principles for a specific desirable outcome, that may not portray the true fundamental financial position of the firm to all stakeholders; it gives rise to the information asymmetry or information failure problem between lenders and borrowers known as *adverse selection*. Borrowing firms and their agents have more information about the fundamentals of the business, compared to lenders. This situation leaves lenders at a disadvantage. According to Davydenko et al (2020) covenants mitigate agency problems. If a technical default occurs on part of the borrower, and the firm remains solvent, then in case of lenders wanting their loans returned, the borrower is in a position to do so through refinancing or asset sales. When the financial stability of a borrower deteriorates, and the firm can maintain its solvency, a loan that is protected through covenants is considered by lenders to be free of risk. Lenders' opinion of the loan being risk free does not change even when there are disagreements about the evaluation of financial position of the borrowing firm, as the loan will be repaid whenever a covenant is violated. Hence, the presence of financial covenants in loan designs address the uncertainty around expected default risks

[3] In such a scenario, a violation of loan covenants is a possible outcome. This not only puts the lenders (Petersen, 1999) and stakeholders that were dependent on their evaluations at risk, but also the borrowing firms and their owners.

and diminishes the adverse selection problem. Davydenko et al (2020) show that loan designs are structured in such a way so as to minimize adverse selection issues by weaving tight financial covenant(s)[4], and striking a balance between renegotiation costs in case of technical defaults by setting covenants loosely. Christensen and Nikolaev (2012) show that the presence of financial covenants in loan designs alleviates the agency problems of adverse selection by bringing the interests of the lender and borrower on the same page through capital-based covenants[5]. Information asymmetry problems are also addressed through the imposition of performance-based financial covenants by the lenders, which act as early warning mechanisms in case of impending financial instability or technical default on part of the borrower and provides control of the firm to lenders when their investments are at risk. Although the literature empirically documents that lenders are aware of adverse selection by keeping financial covenants tight[6], but what happens in case of decreasing quality of financial information? Elkamhi et al (2015) find that when there in considerable noise in the calculation of the value of the accounting signal that is underlying a financial covenant that has been set into loan design, then the tightness of covenant is increased. Which means that agreements where agency problems are addressed to the satisfaction of both borrowers and lenders, more favourable credit terms and financial covenants are written into loan agreements.

This brings us to a valid academic debate on the lender-borrower relationship. How do lenders evaluate the financial health of a borrowing firm? When the evaluation is done, and if there is a disparity between the lender and borrower's figures, will charging higher interest rates be enough for lenders to off-set the information failure? Or are there endogenous variables that the extant literature has so far missed to take into consideration. Specifically, do lenders evaluate the accrual quality of borrowing firms? Does the accrual quality have a role to play in the setting of the covenant threshold at loan inception? How does it effect the number of covenants that are included in the loan? This research addresses these questions in detail.

Dechow (1994) while investigating the role of accruals in evaluating firm performance, finds that for firms with shorter measurement intervals, greater volatility, and longer operating cycles, earnings which incorporate accruals, are more strongly related to stock returns, than are cash flows. Sloan (1996) argues that the information contained in current earnings, about future earnings, is inversely related to the magnitude of accruals, though this relation is not reflected

[4] For example, when there is higher asymmetrical information, then the covenants will be set tightly/strictly.
[5] Types of covenants are discussed in detail in the next chapter.
[6] See, for example, Chava and Roberts (2008).

in stock returns. This means that firms with higher volumes of accruals, experience lower earnings persistence. But what happens in a scenario where a company operates in an industry where higher volumes of accruals are a norm, and has an excellent collection rate? For example: company X has Earnings of $100, with a cash component of $20 and an accrual component of $80 in the form of accounts receivables. If the company routinely collects the majority, or all its outstanding receivables, then it will be experiencing higher earnings persistence which goes against the lower persistence findings. There is a gap here that can be addressed by incorporating the quality of the accruals in question, and analysing its effects while controlling for the levels of accruals.

Bradley and Roberts (2004) provide evidence that the number of covenants added to loan instruments are determined simultaneously with the promised yield. This means that covenants design and interest charged are endogenous variables. If lenders want to be compensated for information risk and adverse selection, then the yield on loans will be higher. Taking the endogeneity into consideration would mean that the number of covenants written into the loan contract would then be directly (negatively) related to the higher interest rates, as decreasing the number of covenants are seen as less stringent measure. But it is possible that lenders determine the initial level of covenant threshold while setting the terms for interest rates, as well as the number of covenants. Intuitively, borrowers would be looking at less strict covenants, if they are paying higher interest rates on the loan they have acquired, and vice versa. Same holds true for the number of covenants in a loan deal, and the covenant threshold(s) for it. If that is the case, then the literature is devoid of an endogenous variable that is related to Interest Rates and Number of Coveannts, in the form of Covenant Threshold. Leaving out endogenous variables from equations and models might result in low-powered results at best, and mis specified results in a worst-case scenario.

Frankel and Litov (2007) determine that the timeliness of earnings, and discretionary accruals have no bearing on the covenants written into a loan instrument, or the initial debt covenant slack. Analysing the discretionary accruals helps researchers in determining the accrual quality of companies. If lenders can effectively and efficiently evaluate accrual quality of borrowing firms, then that means that the related accounting signal that lenders will be depending on will be less noisy. In such a scenario, less stringent financial covenants will be set, which will enable borrowers to avail better terms and conditions. Discretionary accruals will be analysed in this research to support or provide contrarian results to Frankel and Litov's (2007) findings.

Janes (2011) finds that the difference between the covenant threshold set by the lender, and the value of the company's corresponding financial variable at loan inception, is smaller for firms with both low and high accrual levels. Suggesting that firms with extreme levels of accruals get tighter covenants, compared to firms with moderate levels of accruals. If firms with higher volumes of accruals get tighter covenants because of the inherent volatility, then the opposite should be true for firms with low levels of accruals. Again, this is a puzzling finding in the literature as the levels of accruals are analysed without considering the quality of accruals and the endogeneity of variables in lender control.

The quality of accruals is affected by the scope for manipulation by company management, who can exploit the inherent flexibility in GAAP by advancing or retarding the period in which cash flows are passed through the income statement. This creates bias in the accrual numbers. The motives for such exploitation can be; Healy (1985) shows that managers manipulate accruals to maximize their short-term bonuses. Jones (1991) presents evidence of managers tampering with earnings to earn subsidies and commissions from the government. Daley and Vigeland (1983), DeFond and Jiambalvo (1994), Dichev and Skinner (2000), Jha (2013) discuss the management of earnings by firms to avoid debt covenant violations.

In the present literature, a number of models have been proposed to estimate accruals quality, either by examining the relation between accruals and cash flows, or by separating the discretionary accruals component from non-discretionary accruals. The results and analyses of this thesis will be based around six such commonly used models. These models are:

- The Jones Model (Jones, 1991)
- The Modified Jones Model (Dechow et al, 1995)
- The Peasnell Model (Peasnell et al, 2000)
- The Dechow and Dichev Model (Dechow and Dichev, 2002)
- The McNichols Model (McNichols, 2002)
- The Francis Model (Francis, 2005)

This research extends the current literature on debt covenants, borrower firm accruals, lender efficiency, and adds new insight on the statistical robustness of accrual models and the interpretations. The novel contributions are in line with the gaps identified in the preceding paragraphs. These are;

1. Private loan covenant decisions are affected by accruals quality. This is supported by findings of Accrual Quality being taken into consideration while setting Covenant Threshold, Interest Rates, and Number of Covenants in loan deals. Lenders incorporate accrual information to mitigate agency conflicts as well as securing their own interests.

2. Evidence of accrual quality having incremental explanatory power over magnitude of accruals. It is observed that while some Accrual Levels analyses support the hypotheses of Covenant Threshold determination, the estimation powers are weak. While controlling for Accrual Levels, the Accrual Quality measure provides more robust and highly statistically significant results.

3. Apart from testing the traditional "Covenant Slack" metric, a new "Covenant Threshold" metric is proposed. Testing the relationship of initial Debt Covenant Slack and Covenant Threshold, with 'accruals quality' while controlling for accrual levels, cash flows, interest rates, number of covenants, and firm fundamentals. Results show that the Covenant Slack metric is mis specified and Covenant Threshold is a superior measure, as it is in the decision set of the lender.

4. Providing evidence for the endogeneity of Covenant Threshold, Interest Rates and Number of Covenants in a loan deal. While the latter two variables have already been documented to be endogenous in the literature, to the best of my knowledge, this is the first study that identifies a new, highly statistically significant endogenous variable that has been missing from the equations, and the literature overall.

5. An analysis of six different financial covenants, namely Current Ratio, Quick Ratio, Leverage Ratio, Interest Coverage Ratio, Debt to EBITDA Ratio, and the Debt to Tangible Net Worth Ratio. Existing literature primarily focuses on the evaluations of Current Ratio and Net Worth ratio. The four extra covenants analyzed, help in grouping minima and maxima based financial covenants to cross check for consistency of lender evaluation of borrowing firms.

6. Testing covenant interdependence in loan agreements involving multiple financial covenants. It is observed that lenders do not add financial covenants to loan deals,

without each signal performing a dedicated function. This research shows that covenants act as complements as well as substitutes.

7. Ensuring robustness of hypothesized positive results with two different timeframe datasets.

8. Testing for the persistence of balance sheet based financial covenants across two time periods between 1995-2005 and then between 2006-2015. These tests are carried out to support the findings in Demerjian (2011) and Ball et al (2015).

The scope of this research encompasses US companies, and their loan contract designs between the period 1995 to 2005, and 2006 to 2015. The covenants in these contracts are Current Ratio, Quick Ratio, Leverage Ratio, Interest Coverage Ratio, Debt to Ebitda Ratio, and Debt to Tangible Net Worth Ratio, taken collectively. Industries that companies belong to are identified based on their 4-digit SIC codes.

This research finds that overall, lenders are sophisticated users of financial information, while evaluating potential borrower firms and writing loan agreements. Evidence is provided to support Covenant Threshold as a superior measure to Covenant Slack. Accrual Quality is seen to have incremental explanatory power over the Level of Accruals. Lenders take into account the Accrual Quality of borrower firms while setting initial covenant thresholds, interest rates and number of covenants to be written into loan agreements. It is observed that multiple loan covenants in a loan instrument can act as complements or substitutes to each other. The three most important variables for lender decision making process, i.e. covenant threshold, interest rates and number of covenants, are all endogenous. Different accrual models have varying levels of success in supporting hypotheses across the six financial covenant variables. The research finds a strong support for the hypothesized relationships in the 2006-2015 loan sample, as well. Evidence is also presented to support Demerjian (2011) and Ball et al (2015) findings about the lack of persistence of Balance Sheet covenants, but it is observed that the diminishing use of a specific set of Balance Sheet covenants, while true, gives rise to other modified, and adapted derivatives of the previous covenants. The absolute number of Balance Sheet covenants does not see a decrease[7].

[7] Tested for the Debt to EBITDA Ratio financial covenant samples.

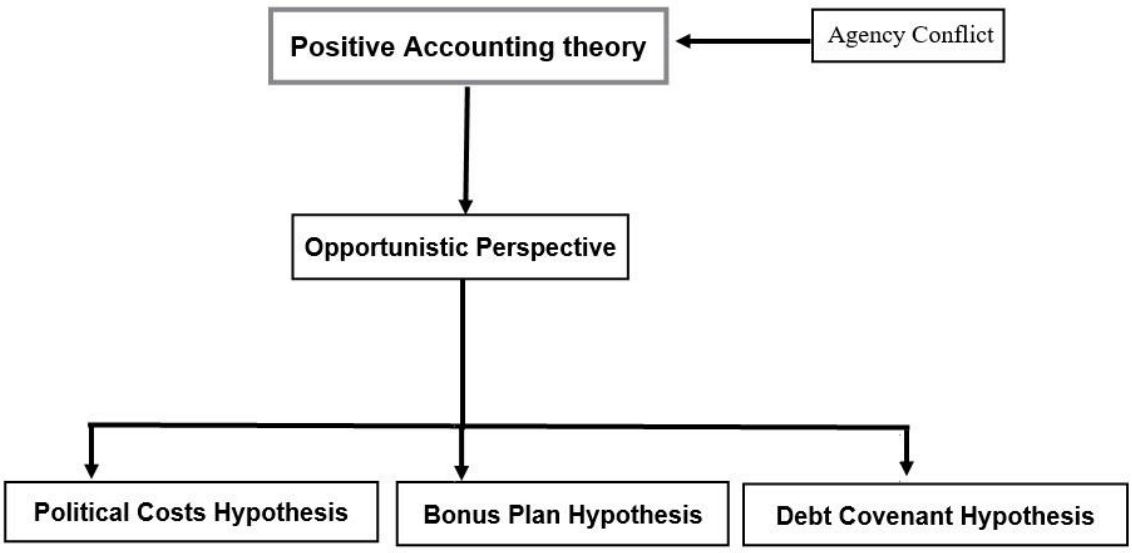
The rest of the research is presented as follows:

I. Introduction.
II. Overview of Literature, and Development of Hypotheses.
III. Data Collection and Methodology.
IV. Discussion of Results.
V. Conclusions and Scope for Further Research.

2. Overview of Literature, and Development of Hypotheses

2.1. Overview of Literature

Positive Accounting Theory (Watts and Zimmerman, 1978, 1986) illustrates how firms cope with their ever-changing environments through the adoption and implementation of accounting policies and methods. It seeks out how, and why, the management of a firm chooses to switch between different accounting practices. Part of the answer may lie in Jensen and Meckling's (1976) 'Theory of the Firm' which suggests that the primary goal of an organization should be the wealth maximization of its shareholders. Hence managers may be efficient, basing the choice of their accounting policies on improvement of firm value. But the 'agency conflict' between agents of the firm (management) and principals (shareholders) raises concerns about managers not always acting in the best interests of the firm's owners. The conflict manifests itself under the Positive Accounting Theory as Opportunistic Behavior by firm management.



The illustration above shows the relationship between Opportunistic Perspective of Positive Accounting Theory and the Agency Conflict. The agency theory suggests managers may act in a self-serving manner, and Positive Accounting Theory identifies the causes for such an event. According to Watts and Zimmerman (1986), managers act opportunistically under three broad categories: The Bonus Plan Hypothesis, the Political Cost Hypothesis, and the Debt Covenant Hypothesis.

Owners of firms are aware of the agency conflict. To mitigate the issue, they enter into binding contracts with the agents. Managers may be awarded a fixed contract, given an ownership in the firm (through company stock), compensated based on the performance of the company (accounting earnings), or a mutually agreed upon formula (Holthausen, 1981). Manager remuneration that is in some way tied to the performance and earnings of a company may lead self-serving managers to adopt accounting practices that artificially inflate or deflate bottom line earnings[8]. This is known as the Bonus Plan Hypothesis. An earnings increase will shift the compensation (bonus) paid to managers upwards, as it is normally calculated as a percentage of bottom-line earnings. On the other hand, managers may also be inclined to shift bottom line earnings downwards. DeFond and Jiambalvo (1994) suggest the case of incoming new managers who may engage in an 'earnings bath', making losses even worse by prepayments and delaying revenue recognition[9], so that the earnings from that year onwards look healthier comparative to previous years. Hence managers can not only secure their position but also get higher compensations as a result of higher earnings compared to previous years.

The Political Cost Hypothesis states that large firms tend to manage earnings lower so as to avoid governmental regulation and oversight. The avoidance of political costs is linked to firm size. According to Daley and Vigeland (1983), big firms with higher earnings attract the attention of the public and lawmakers. To safeguard the interests of all stakeholders, such firms, and the industries that they operate in may be highly regulated and have continuous reviews of their operations. Hence managers are tempted to understate the earnings of the company by changing accounting techniques[10].

[8] For example, changing depreciation methods.
[9] Accruals manipulation.
[10] For example, by switching from straight line to accelerated depreciation.

The Debt Covenant Hypothesis encompasses managerial action when there is an impending loan covenant violation and suggests that managers will act opportunistically to manipulate earnings and avoid breaching loan covenants. Research on Positive Accounting Theory and the Debt Covenant Hypothesis lends credence to managerial opportunism. Several studies[11] show that managers will engage in earnings manipulation for personal gains, avoiding regulation and the breach of loan covenants. Earnings manipulation may have serious consequences for the firm in the shape of illiquidity, financial distress, lender imposed violation costs, and even bankruptcy, due to increasing volatility[12] of future earnings. Healy (1985) shows that managers manipulate accruals to maximize their short-term bonuses. Jones (1991) presents evidence of managers tampering with earnings to earn subsidies and commissions from the government. DeFond and Jiambalvo (1994), Dichev and Skinner (2000), Islam et al. (2011), Jha (2013) discuss the management of earnings by firms to avoid debt covenant violations. Bernard and Skinner (1996) evaluate both the opportunistic as well as informational incentives, and call for reliable methods to detect earnings manipulation. But the literature seems to be devoid of research on the fact that if managers do act opportunistically, then lenders failing to identify it will give rise to information risk. Janes (2003) provides evidence that sophisticated and advanced users of financial data fail to fully employ the information that can be obtained from accounting accruals.

Sloan (1996) demonstrates that earnings are more persistent if they are comprised of a large magnitude of cash flows, and low levels of accruals. The higher the magnitude of cash flows, the greater the persistence and consistency. But Dechow (1994) argues that accruals make earnings a better measure of firm performance and stability, compared to cash flows. This is because evaluating a firm on the basis of cash flows alone ignores the potential *future* cash flows that will result from the realization of accruals. Dechow and Dichev (2002) further provide evidence in this regard and show that accrual magnitude is a complement to accrual quality[13], not a substitute. This means that 'accrual magnitude' studies fail to take the quality

[11] Healy (1985), Jones (1991), DeFond and Jiambalvo (1994), Dechow et al. (1995), Bernard and Skinner (1996), Peasnell et al. (2000), Dichev and Skinner (2002), Janes (2003), Islam et al. (2011), Fung and Goodwin (2013), Jha (2013), Darjezi (2016).

[12] Consider the case of accelerated revenues. There will be a shift of earnings from future periods to the current period to achieve a desired result, but that in turn makes current earnings a very poor base for estimating future earnings, as there will be a decline in future revenues.

[13] Dechow and Dichev (2002) define accruals quality as "the extent to which accruals map into cash flow realizations".

of accruals into account. Existing literature does not focus on the quality of accruals enough when it comes to the evaluation of lender-borrower relationship. If lenders make efficient and effective use of available information (Petersen, 1999) and the market is generally considered to respond to information in a similar manner[14], then the accrual quality of earnings may be a significant borrower-evaluation tool for lenders. This in turn reflects on research such as that carried out by Sloan (1996) and Janes (2011) as mis-specified, due to the focus on levels of accruals and omission of the accrual quality metric.

2.1.1 Characterisation of Risky Debt

Debt is a promise by a borrower to a lender, in return for funds, to pay the principal amount and periodic coupons, at dates and times specified in the loan instrument. Debt can be viewed as a portfolio of future riskless payments of coupons and principal; short European[15] put options written on the assets of the borrower, with exercise prices equal to the promised coupon and principal payments. The put options reflect the limited liability of the corporation. Default on the debt leads to bankruptcy, where the assets of the borrower are transferred to the lender, but the debt is then cancelled. The put options are not independent, because default one payment implies default on all subsequent payments.

Black and Scholes (1973) and Merton's (1973, 1974) theory of options suggests that *ceteris paribus*, the value of the lender's claim is positively related to the value of the borrower's assets, and negatively related to the volatility of borrower's asset values. In addition to intrinsic risk of default, borrowers can play games with the lenders' money in order to increase the value of their residual claim to the assets (Myers, 1977. Smith, 1993). Examples are, cash disbursements to borrower's shareholders, undertaking excessively risky investments, and taking on more debt.

The impact of the risk-free rate, time to maturity, and principal and coupon payments is complicated by the fact that they affect both the risk-free value of the loan payments as well as the options. The relation between put value and the value of the underlying asset is negative for the holder, and therefore positive for the writer. The relation between volatility of the underlying assets values and put values is positive for the holder and therefore negative for the

[14] As under the Efficient Market Hypothesis.
[15] The difference between European and American options is that, a European option can be exercised at a specific pre-defined time, whereas an American option can be exercised any time before the expiry date.

writer. Paying dividends lowers the value of the underlying assets, increases the value of the put options, which are a liability to lenders. Increasing the risk of the underlying asset values increases the value of the put options, a liability to the lenders. Taking on more debt increases the likelihood that the put options will be exercised.

2.1.2 Debt Covenants

Lenders safeguard their interest by adding covenants to loan instruments (Smith, 1993). Debt covenants are promises made by borrowers to their lenders that certain activities will be performed (or refrained from) by the organization. These are in the form of formal agreements, and binding on the borrowers. Covenants typically come in the shape of financial ratios and numbers. Their breach acts as an early indication of impending financial trouble, for lenders. Adherence also signals financial stability to shareholders[16].

There are two broad categories of debt covenants. Positive debt covenants and negative debt covenants. Positive debt covenants require the borrowers to achieve or maintain certain targets. In terms for financial ratios, these can be, for example, maintaining a *minimum* Current Ratio or Quick Ratio of 2. Any time the borrower's liquidity drops below this threshold, it constitutes a breach of the loan covenant. Higher liquidity levels may ensure that borrowers will not default on scheduled principal and interest payments, signalling the financial stability of the firm. Negative debt covenants on the other hand prevent the borrower from carrying out certain activities. For example, prohibiting mergers, paying out dividends to shareholders, or acquiring more debt. Debt restrictions are written into contracts in the form of *maximum* Debt to Earnings ratios, or Debt to Tangible Net Worth ratios or Leverage ratios. Since its GAAP principles that are used to design and monitor restrictions on accounting variables (Daley and Vigeland, 1983), ceteris paribus, covenants can be relaxed by changing the accounting techniques employed by the borrowing firms.

In these two broad covenant categories, covenants can be further subdivided based on their specific functions and controlling mechanisms. Gilson and Warner (1998) and Paglia (2002) classify covenants as: *Operating Activities Covenants* which limit the operations of the firm, that are carried out on a daily basis. It helps lenders monitor the line of business that the borrower's involved in, ensure that borrowers meet their obligations, and restrict the use of

[16] In other words, loan covenants impose direct control to reduce risk of default, or losses from default, and also provide for legal intervention points after a breach of covenants, called technical default, allowing lenders to take action to safeguard their interests and renegotiate terms of the loan given to the borrowers.

proceeds by the agents. *Investment Expenditures Covenants* put curbs on buying new land, machinery, buildings and other capital expenditures. They also curtail acquisition activities on part of the borrower. *Asset Sales Covenants* prevent borrowers from selling off the assets of the business while this specific covenant is in place. They limit liquidations done voluntarily, and asset transfers within or outside the borrower's business units are prohibited. *Preservation Covenants* primarily deal with maintaining the value of collaterals that have been pledged by borrowers, as part of the loan deal. Such covenants help lenders ensure payment of their principal plus interest, in case of a default by borrowers. If lenders do not set Preservation Covenants into loan deals, then the value of collaterals after a certain time period, might not be enough to cover their interests. *Management, Ownership and Control Covenants* help lenders maintain the status quo that was present at the loan's inception. Specifically, it prohibits changes to the management of the company, or the board of governors, and refrains the borrower from partaking in merger activities. *Liquidity Covenants* either require borrowers to maintain a set amount of cash or cash equivalent assets, or limit the sale of such assets by the borrowers[17]. *Investment Covenants* make sure that borrowers do not cross a pre-determined limit of investments, in the form of capital expenditures or acquisitions etc[18]. *Cash Payout Covenants* make sure that the lenders' claims are met and addressed before those of the firm's agents and owners. This is done by restricting the payment of dividends among shareholders, or by cutting down on salary and fee payments to management and employees of the company. *Financing Covenants* deal with the amount of debt borrowers can acquire, with lenders restricting additional borrowing to secure their positions. These covenants also restrict changes to the capital structures of firms, monitor and limit issuance of new equities, and limit the acquisitions of new leases and provisions of guarantees. *Reporting and Disclosure Covenants* are extremely important from an oversight point of view for the lenders, because they deal with the timely provision of company financials, show periodic reports that measure firm fundamentals and their adherence to covenants, and are used to inform stakeholders about accounting method changes being employed by borrowers. *Coverage and Cash Flow Covenants* primarily deal with a borrower's ability to pay interest on time, and for lenders to monitor the earnings and cash flows of the business over a period. *Dividend and Distribution Covenants* restrict the amount

[17] Such covenants are usually set in the minima metric. In the post-2005 time period sample such covenants are also set with exact limits.

[18] These covenants are set in the maxima metric.

of earnings that can be paid out as dividends to stockholders and curtails a borrower's ability to buy back shares.

As covenant violations allow lenders to intervene and protect the value of their claims, therefore debt covenants are important options held by the lenders, with exercise "prices" equal to the covenant thresholds specified in the loan instruments. When there are multiple covenants in the same loan agreement, the options are not independent. They share some similarities with an 'add up basket credit default swap', which pays off when any one of a number of reference events occur.

The presence of covenants (options) increases the value of debt, and therefore lowers the interest rates that are charged by lenders (Bradley and Robers, 2004). This means that there is a trade-off between increased oversight on part of the lenders, and reduced flexibility on part of the borrowers (Smith, 1993). For example, the addition of an extra financial covenant to a loan instrument, will lower the cost of capital for borrowers. They get cheaper debt, with an increase in the monitoring of the firm's activities by the lenders.

In the presence of adverse selection, borrowers who are less inclined to 'game' debt are more likely to accept negative covenants, because the reduced flexibility is less attractive to them (Akerlof, 1970. Chow, 1983).

2.1.3 Consequences to Borrowers for Violation of Debt Covenants

According to Sweeney (1994), if borrowing firms violate and cross thresholds set up in debt covenants, they are said to be in 'technical default'. This is different from a 'debt service default', where the firm fails to make a scheduled interest payment, or the principal amount. Watts and Zimmerman (1986) argue that firms that are close to technical default will opt for income increasing accounting methods, shifting earnings from future periods to their current ones. It may help managers in avoiding or delaying the breach of a debt covenant, and the associated costs that will be imposed by the lenders. This is known as the Debt Covenant Hypothesis.

Smith (1993) illustrates that following a violation, a renegotiation process takes place. In public debt issues due to the large debt holder base, and the high costs associated with bringing all parties together and agreeing on a solution, a violation ends up in bankruptcy. On the other hand, an event of a debt covenant violation in private debt issues is routinely addressed through

redesigned loan agreements (Smith, 1993. Dichev and Skinner, 2002).[19] According to studies carried out (Beneish and Press, 1993, Chen and Wei, 1993, Smith, 1993) almost all technical defaults take place in issues of private debt. This supports the view of private debt being more negotiable and less costly when it comes to the violation of loan agreements, with the borrowing firm being able to continue operations after the *event*. Looking at the samples and results from these studies, it is observed that almost all covenants being breached are positive covenants (for example, Minimum Current Ratio covenant, Minimum Net Worth covenant).

Violating firms have higher leverage, are less profitable, less liquid, and their return on stock is lower (Beneish and Press, 1993). Chava and Roberts (2008) document a fall in capital investment in a firm after a violation of loan covenants. Thus, financial performance plays a role in technical violation. According to Beneish and Press (1993), typical actions by lenders following such an event include modifying loan contracts, renegotiating the loan, or terminating the credit line. Renegotiation costs involve making amends to contracts. These costs include payments to attorneys, accountants and time spent by managers in rewriting these agreements. These costs are directly related to financial distress. According to Ang et al. (1982), and Weiss (1990), renegotiation costs for bankrupt firms range between 3% and 7% of firm value. For small firms, renegotiation costs are low (Leftwich, 1981). After a technical violation, lenders increase their control of firm activities and exercise various contractual rights, which impose refinancing and restructuring[20] costs on violators.

The costs vary with lender response: violation is less costly for firms that can obtain a waiver than for those that cannot, but waivers are still costly since lenders extract fees and concessions in exchange for granting them. Increases in interest rates account for 0.84% to 1.63% of equity, whereas refinancing and divesting of assets to make capital repayments account for 0.37% of equity. Although there are increases in the number of positive covenants, but most of the additional covenants written into loan contracts after an event, are negative. There are reductions in cash disbursements to shareholders, and a higher turnover of CEOs is observed.

[19] The difference in outcome affects the setting of covenant thresholds, with covenant thresholds in public debt less strict than in private debt (Smith, 1993). This also explain why covenants in private rather than in public debt are violated more often and are first to be violated (Sweeney, 1994)

[20] Refinancing costs are the incremental costs of debt. Restructuring costs are those that are associated with adjusting the capital structure of a firm, or divesting assets of the business which affects operations. These are both classified as indirect costs of default.

The aggregate costs of violations, to borrowers, have been estimated at 1.2% to 2% (4.4% to 7.3) of equity (debt) (Beneish and Press, 1993. Sweeny, 1994. Chava and Roberts, 2008. Nini et al, 2012). Dyreng (2009) estimates that the lower bound cost is an addition of 0.12% to 0.23% to interest rate. The estimate is based on increased taxes from positive earnings management, which, given rational decision making, means the costs of violations are at least as much. It is also pertinent to mention here that, according to Sweeny (1994) 52% of all technical defaults receive a waiver.

Technical violations occur often, with about 30% frequency in all loans. Considering the number of violations, and the fact that it is 10% to 20% likely that a firm will experience technical default in a given year, the costs are significant (Dichev and Skinner, 2002. Dyreng, 2009. Nini et al, 2012).

2.1.4 Consequences to Lenders for Violation of Debt Covenants

Many of the costs to borrowers are direct cash benefits to lenders, in the case of a violation. The remainder affect the value of the lenders' claims through increased oversight role in the governance of corporations (Nini et al, 2012). As well as benefits, lenders also face renegotiation costs after a technical default.

If the average costs and benefits per technical default depend on the *accounting signal* and the *frequency* of default, then the choice of the covenant variables, and the thresholds that are set for intervention, become and economic decision for the lender. For example, as discussed earlier, public debt has higher renegotiation costs compared to private debt. Hence public debt covenants have less stringent covenant thresholds. Different covenant variables lead to different rates of technical default. Net worth and working capital covenants are the most frequently violated (Sweeney, 1994). Different thresholds will also influence the likelihood of technical default.

Financial variables that jointly or individually signal high (low) net benefits to the lender intervention are likely to have less (more) exacting thresholds for intervention. Less (more) exacting translates into higher (lower) thresholds for positive covenants, and vice versa for negative covenants.

2.1.5 Modelling Covenant Decisions

This segment reviews literature related to the types of covenants employed, how many and how often they are employed, the tightness of covenants, interest rates, and covenant interdependence.

When a covenant breach takes place, the lenders, to secure their positions add negative covenants to the renegotiated loan instruments. These additional covenants are primarily related to oversight on the borrower's investment activities and further financing (Beneish and Press, 1993). Loans are more likely to include multiple covenants when the borrower is small, has higher growth opportunities, and is more highly leveraged. There's a caveat to the number of covenants in a loan; the higher the interest rates, the lower the number of covenants and vice versa. There is a negative relation between interest rates and the presence of covenants (Bradley and Roberts, 2004). Loans made by investment banks have higher chances of extra covenants. Covenant numbers are also positively related to recessions, and, when the credit spreads are large. Lou and Otto (2015) report the use of extra covenants in new loans, when the existing debt is dispersed across different lenders, particularly for risky borrowers with opaque accounting. This suggests a dynamic approach to lending, where dispersion of debt today leads to more covenants in the future.

Frankel and Litov (2007) try to dissect the relationship between accounting-based covenants, covenants slack and discretionary accruals. While they conclude that there are no significant relationships between initial debt covenant slack set on loan covenants, and discretionary accruals, the relation is significant for covenants based on balance sheet values. Christensen and Nikolaev (2012) discuss the use of capital covenants, which directly affect the use of balance sheet values and limits the amount of debt, is negatively correlated with the use of performance covenants, which pertain to current efficiency and profitability indicators. Performance covenants are used only when the accounting variables are good signals of credit quality. This suggests that a combination of covenants, although inversely related, can be interdependent.

Accounting signals are prepared by company agents, presumably acting from self-interest or the interests of shareholders, but not lenders. The signals are thus susceptible to manipulation. When the quality of a signal declines, the prediction is that slack will increase. In the limit, as the signal becomes completely uninformative, slack becomes infinite, which is tantamount to saying the signal will be abandoned from loan covenants. This is consistent with the disappearance of some financial accounting variables from loan covenants as fair value

accounting has become more widespread. Which accounting variables are affected can also be predicted. Demerjian (2011) argues that the use of balance sheet based financial covenants has declined over the years and presents the case of the same group of covenants encompassing 80% deals in the mid-1990s to only 32% in mid-2007. A similar trend is not observed in Income Statement based financial ratios. Ball et al (2015) back up these findings, as they observe a decrease in accounting based debt covenants[21], but they explain it by reduced contractibility of accounting variables rather than reduced transparency.

The analyses of covenant decisions are prone to poor specifications. Mohrman (1993) and Dichev and Skinner (2002) suggest that leverage should not be used as a proxy for covenant tightness. Leverage does not take the covenant variable into account and whether its value would be affected by an accounting policy change. Murfin (2012) report that financial institutions such as banks, write tighter debt covenants after they suffer payment defaults. This behaviour is consistent even when the borrowers are in different industries and geographic locations from the present defaulting borrower. Defaults affect lenders' perception of their own screening abilities.

Lending institutions charge higher interest rates from borrowers with low or high accruals (Janes, 2011). This again leads us to the misspecification debate, because of the endogeneity of interest rates with other variables of interest to the lenders. When lenders are evaluating borrowers, they analyse the accounting quality as well. Facing borrowers with low accounting quality, lenders increase the number of covenants, reduce covenant interdependence, and increase the tightness of covenants. Increasing accounting quality is more important for reducing the cost of debt, than agreeing to stricter debt covenants (Spiceland et al, 2015). Even when lenders take into account the credit rating of borrowers, there is still the issue of which industries borrowers come from. Amiram et al (2017) find that interest rates charged by the lenders are affected by the industry characteristics of borrowers. The effect is strengthened when the lender is not well diversified and appear to relate to the bearing of industry-level risk.

2.1.6 Quality of Financial Variables

Financial variables have a high value for lenders, if they signal a high net benefit resulting from intervention. But signals used by lenders are likely to be manipulated by borrowers. Studies carried out by DeFond and Jiambalvo (1994), Sweeney (1994), Dichev and Skinner (2002),

[21] There is a larger decline in the use of accounting based debt covenants in banks, which make greater use of fair value accounting.

Jha (2013) provide empirical evidence to support the hypothesis that managers act in an opportunistic manner to manipulate the earnings of a company and stave off or delay an expected debt covenant violation.

Manipulation is desirable, inter alia, because of the incentives facing borrowing companies to avoid cost of technical default. Manipulation is possible within the rules of GAAP by advancing or retarding the period in which cash flows are passed through the income statement; that is, by adjusting accruals.

DeFond and Jiambalvo (1994) hypothesize a positive relationship between the restrictions in debt covenants, and mangers exercising their discretion over the use of accounting methods. From their sample, a significant relationship is observed between the discretionary changes of accounting methods by managers and debt covenant violations, a year prior to the event. Both abnormal total and working capital accruals show a positive relationship. This means that managers are aware of the financial instability of the firm which might lead to a technical default and engage in earnings manipulation to avoid the violation. An interesting result in their analyses is that in the year of violation (at time t = 0), violating firms show positive abnormal working capital accruals only.

Sweeney (1994) from her study of debt covenant violations shows that the financial performances of firms nearing technical default drop as they approach the time of violation (t = 0), and that managers engage (or switch) in accounting activities that manipulate cash and non-cash indicators, which is consistent with the theory. A point that she makes is managers act to avoid violations if the option is available in the first place, referring to the fact that companies cannot change accounting practices within a certain time period more than once. If all the available techniques have been employed, and the company cannot make any changes to its accounting methods for a certain time period, then debt covenant violations may not be avoided. But the study also observes that managers are rational and may avoid making a switch even if legally allowed, if the change is going to bring about significant negative cash flows (such as, increased taxes) compared to expected costs of violation.

Further support to the opportunism of borrowers is lent by Dichev and Skinner (2002) and Jha (2013). In interviews with bankers by Dichev and Skinner (2002), it is revealed that almost 20 to 30 percent of all loans breach at least one covenant, with some instances of 40 to 50 percent. From their empirical analyses, almost 30 percent of their sample firms violate debt covenants,

and they observe a strong relationship between the actions taken by managers to avoid a debt covenant violation, and the proximity of the event. Managers actively try to avoid a technical default. Similarly, Jha (2013) also finds in his large-scale study that management distorts earnings upwards in the quarter preceding a violation, and downward in the quarter in which the technical default takes place. Accruals are continually managed downward while the technical default persists. It is speculated that borrowers do this so as to increase their bargaining power.

Not all violating firms get the same treatment in the aftermath of such an event. Large, stable firms have their covenants relaxed and are usually given an affordable waiver. Whereas firms with fluctuating financial conditions are dealt with more seriously, increasing loan costs, number of covenants, and their tightness. Chen and Wei (1993) find that the decision to waive technical default depends on the probability of bankruptcy, leverage rate, debt maturity[22] and amount, and security of the loan. Borrowers can therefore estimate probability of receiving waiver, which will affect expected costs of technical violation and incentive to manipulate accruals.

2.1.7 Accruals Quality

Earnings of companies are greatly affected by the accounting treatments that they employ (DeFond and Jiambalvo, 1994). Upon decomposition, earnings are broken down into cash flows and accruals. From a stakeholder point of view, predicting future cash flows is a crucial step for decision making. Accruals are a strong indicative element of *future* cash flows. Dechow (1994) argues that the analysis of earnings to measure the financial stability of a firm, yields far superior results compared to that of the underlying cash flows.

The opportunistic behaviour of managers relies in part on the options available to them. According to Healy (1985), using accruals to shift earnings between periods is less costly, as compared to, for example, switching from accelerated depreciation to straight line depreciation. This idea is reiterated by Smith (1993) that modifying techniques back and forth, is a costly process[23]. Together with Sweeney's (1994) view of prior methods exhaustion, the analysis of accruals seems to be crucial from an academic as well as an industrial perspective, because

[22] The impact of maturity is not supported empirically.
[23] For example, auditors will need to help clients implement the changes and deal with the retrospective consequences. An increase in the work performed by auditors increases auditor fees.

accruals have a direct impact on managerial behavior (opting for a low-cost alternative to avoid a debt covenant violation, by shifting earnings from future to current periods) as well as the design of a loan contract. It has been shown in the literature[24] that accruals can be manipulated by firm management to portray a healthier financial position of the firm, which makes it a good proxy for the detection of earnings management.

Sloan (1996), in his study links the persistence of earnings to the level of accruals in a firm. Specifically, he shows that to see whether firms have high quality income, the cash flow component of their earnings must be high (with low levels of accruals). This would eliminate the uncertainty regarding the future cash flows from accruals, and stakeholders would be able to predict future earnings for firms with higher accuracy. Sloan (1996) raises an important concern indirectly around the earnings and accruals debate; that is, accruals are prone to estimation errors. If the calculation of accruals is noisy, includes estimation errors, and have been modified by the management to further their agendas, then they are said to be of 'low quality'.

According to Dechow and Dichev (2002), accrual quality refers to how well they map into the realized cash flows of the company. They find that the increasing magnitude of accruals, standard deviation of sales, standard deviation of cash flows, and increasing length of the operating cycle, all lower accrual quality. Addressing Sloan's (1996) concerns around accruals, cash flows and earnings, it is shown empirically that the relationship between earnings persistence and accrual quality is closer than the relationship between level (magnitude) of accruals and earnings persistence. That is, quality of accruals is positively related to earnings persistence.

Francis et al (2005) find that the quality of accruals is negatively related to the cost of equity and the cost of debt. Non-discretionary accruals are seen to have a significantly larger impact than discretionary accruals. This means that if the quality of accruals is low, covenants do not provide a desired level of lender protection since they become less tight, and interest rates increase. This also adds up to the endogeneity debate around interest rates and covenant numbers. Frankel and Litov (2007) find little evidence of a reduction in the initial 'debt covenant slack' when accrual quality is low. Whereas Ghost and Moon (2010) report a positive

[24] Healy, 1985. Jones, 1991. DeFond and Jiambalvo, 1994. Dechow et al., 1995. Bernard and Skinner, 1996. Peasnell et al., 2000. Dechow and Dichev, 2002. Islam et al., 2011. Fung and Goodwin, 2013. Jha, 2013.

(negative) relationship between the level of debt and accruals quality, when the level of debt is low (high).

2.1.8 Industry Evaluation

A concentrated industry is one in which a handful of companies dominate the market they operate in. Mackay and Phillips (2005) argue that concentrated industries have higher asset sizes and stable profitability, compared to competitive industries. Firm fundamentals are affected by the industries that companies operate in, which in turn gives rises to differing risk premiums charged by lenders. Another aspect to consider here is the ratings of industries. Amiram et. al. (2017) provide evidence that borrowers operating in industries with poor ratings have lower expected growth, shorter maturity periods, smaller amounts of loans, and more financial covenants in their loan contracts.

If lenders are aware that industries with monopolies or duopolies are to be treated differently than those with a diverse number of market participants, and if firm fundamentals correlate with industrial conditions, it is expected that these lending institutions would design loan contracts in such a manner that each financial covenant woven into an agreement would give them an industry-specific signal about the financial health of the borrower.

2.1.9 Models of Accrual Quality

Accruals can be divided into two parts, based on the operational aspect of the firm; discretionary accruals and non-discretionary accruals. Non-discretionary accruals are obligatory expenses of the business, needed to carry out the operations. These expenses are recorded in the account books, before their actual realization takes place. For example, salary expense, utility bills. Discretionary accruals on the other hand, are ‘expenses’ that the management can exert their discretion over. For example, allowance for the accounts of bad debt. In the extant debt covenant hypothesis literature, the presence of discretionary accruals, and their magnitude, determine the extent of the earnings manipulation by a company. The higher the percentage of discretionary accruals in total accruals, the lower the quality of earnings.

This means that an empirical model that aims to evaluate the true level of accruals of a firm, needs to incorporate discretionary and non-discretionary accruals components to reach total accruals. Whenever the total non-discretionary component is matched with the total accruals level, researchers can gauge the level of discretionary accruals. Which can in turn tell us about how much accruals have been tampered with, so that an accurate assessment of the quality of accrual reporting by the firm can be made. Models need to account for the Non-Discretionary Accruals considering their current and long-term components. The overall accrual figure will be a sum of non-discretionary as well as discretionary accruals, with discretionary accruals being measured by the magnitude of residuals in an empirical model.

For example, the amount of accruals of a company are dependent on the revenue earned by the firm, and the tangible part of total assets. This is because increases in sales revenue are going to increase credit sales which will shift accounts receivables upwards, and more tangible asset additions will result in increasing depreciation expenses. i.e.

Increasing Revenue → Increasing Credit Sales → Increasing Accounts Receivables

Increasing Assets → Higher Depreciation in Property, Plant & Equipment

To estimate the 'normal' accruals that have had no managerial manipulation, revenues and long-term assets are used as independent variables. The 'normal' accruals from the model are then subtracted from the "actual" accruals reported, to get the required discretionary accruals. Significant levels of discretionary accruals will signal manipulation by the agents, and vice versa.

This research aims to evaluate hypotheses in light of the Jones Model (1991), Modified Jones Model by Dechow et al (1995), Peasnell et al model (2000), the Dechow and Dichev model (2002), McNichols model (2002) and the Francis et al model (2005).

The accrual models encompass independent variables that cover current part of non-discretionary accruals, long-term non-discretionary accruals, changes in receivables, and cash flow realizations.

- **The Jones Model**

Jones (1991) investigates whether firms benefitting from import reliefs engage in managing their earnings downward. Managers may employ earnings management techniques in order to become eligible for import relief, or for an increase in the amount of relief granted. The case

of the footwear industry in 1984 is outlined, where ITC[25] investigated the industry's petition for relief and found the companies to be making a profit, thereby not eligible for assistance. A year later, in 1985, a second review was conducted on the recommendations of the Senate Committee on Finance, and the results (profits) had changed drastically in a short span of time for the industry. This sharp, sudden decline in the profitability of the industry led some ITC members to speculate about deliberate reporting of lower profits, and of losses. According to Jones (1991) a case can be made against downward earnings management, as higher reported earnings could help companies to obtain favourable debt covenants. But, lenders may be inclined towards waiving violations of covenants if the relief obtained helps to improve the overall performance of the company in the long run.

Managers may employ accounting principles and methods discretion, usage of accruals and capital structure changes like debt to equity swaps, to manipulate earnings. Jones (1991) focuses on total accruals and formulates an accruals model to test the earnings management hypothesis. The model decomposes Total Accruals (TA) into Current Accruals and Non-Current Accruals. It identifies ΔRevenues as a proxy for current non-discretionary accruals, as revenue is observed to have an impact on the accounts receivables, inventories and trade payables of a company. Property, Plant & Equipment (PPE) is taken as a proxy for non-current accruals, comprising depreciation expense. The error term ϵ_t is an estimate of Discretionary Accruals. The fluctuations of the error term is what the study focuses on to evaluate the accrual quality.

$$\frac{TA_t}{A_{t-1}} = a_1 \frac{1}{A_{t-1}} + a_2 \frac{\Delta Rev_t}{A_{t-1}} + a_3 \frac{PPE_t}{A_{t-1}} + \epsilon_t$$

Where,

TA_t = Total Accruals in year t.

ΔRev_t = Revenues in year t less Revenues in year t-1.

PPE_t = Property, Plant & Equipment at the end of year t.

ϵ_t = The residual, representing firm-specific Discretionary Accruals.

A_{t-1} = All variables are scaled by lagged total Assets.

[25] International Trade Commission

Jones (1991) scales the variables to overcome biasedness and heteroskedasticity issues. The sample size for the study consists of 23 firms, operating in five different sectors.

- **The Modified Jones Model**

Bernard and Skinner (1996) criticize the Jones Model's specification of discretionary accruals. A limitation of the Jones (1991) model is that it does not incorporate managerial discretion exercised over reported revenues, especially accounts receivables. Jones (1991) states that "Revenues are used to control for the economic environment of the firm because they are an objective measure of the firms' operations before managers' manipulations, but they are not completely exogenous". An underlying assumption of the Jones Model is that revenues are non-discretionary. If managers exercised their discretion over the treatment of receivables, then that assumption would not hold.

The Modified Jones Model by Dechow et al (1995) extends the Jones Model, to address the issue of revenue manipulation by managers. To adjust for the problem, change in Receivables is subtracted from change in Revenues in the event year.

$$\frac{TA_t}{A_{t-1}} = a_1 \frac{1}{A_{t-1}} + a_2 \frac{(\Delta Rev_t - \Delta Rec_t)}{A_{t-1}} + a_3 \frac{PPE_t}{A_{t-1}} + \epsilon_t$$

Where,

TA_t = Total Accruals in year t.

ΔRev_t = Revenues in year t less Revenues in year t-1.

ΔRec_t = Net Receivables in year t less Net Receivables in year t-1.

PPE_t = Property, Plant & Equipment at the end of year t.

ϵ_t = The residual.

A_{t-1} = All variables are scaled by lagged total Assets.

- **The Peasnell Model**

Islam et al (2011) report that the Modified Jones Model is not effective for detecting earnings management in their sample. Peasnell et al (2000) reports that the models presented in Jones (1991) and Dechow et al (1995) are useful for detecting manipulations of revenue and bad

debts, but not for expense manipulations other than bad debts. Peasnell et al (2000) propose the following marginal model to compensate for the needed adjustments.

$$\frac{WCA_t}{A_{t-1}} = a_1 + a_2 \frac{REV_t}{A_{t-1}} + a_3 \frac{(REV_t - \Delta GREC_t)}{A_{t-1}} + \varepsilon_t$$

Where,

WCA_t = Working Capital Accruals in year t.

Rev_t = Revenues in year t.

$\Delta GRec_t$ = Changes in Gross Receivables in year t.

ϵ_t = The residual.

A_{t-1} = All variables are scaled by lagged total Assets.

- **The Dechow and Dichev Model**

Dechow and Dichev (2002) emphasize the importance of earnings in evaluating firm performance, and break earnings into its cash flow and accrual components. While cash flows can be easily assessed, accruals are inherently prone to estimation errors. These can be classified as intentional and unintentional errors. For example, two customers A and B who purchased goods from firm X on credit, owe the company $75 and $25 respectively. If firm X reliably collects the $100 from both customers, 'accrual quality' is considered to be high. If customer B fails to honour the credit agreement, this gets classified as bad debt, and an unintentional error is recorded on part of firm X for evaluating the value of accruals as $100, whereas it is now $75. Intentional error is when the firm manipulates the receivables account, and falsely shows higher amounts of outstanding receivables in an effort to portray a healthy position of the firm to stakeholders. The higher the accrual errors, lower will be the quality of accruals.

Dechow and Dichev's (2002) measure of accrual quality is the extent to which working capital accruals map into cash flow realizations. Higher the match, better the quality of accruals. Unlike previous studies and models where attempts are made to establish a connection between opportunistic behaviour of managers and accrual quality, Dechow and Dichev (2002) refrain from separating intentional errors from unintentional errors, as both (will) result in lower quality of accruals. The model proposes the measure of accruals to be changes in working

capital, and cash flows from operations being the proxies for cash flows from accruals. The error term, or residuals, represent the accruals that are not related to cash flows realizations. The smaller the error, the higher the accrual quality.

The Jones and Modified Jones models regress Total Accruals onto sales and fixed assets related independent variables, whereas the Dechow and Dichev model regresses changes in working capital onto past, present and future cash flows. A criticism of the Dechow and Dichev model is its use of the future variable, CFO_{t+1}. Since our datasets are from 1995 to 2005, and 2006-2015, this does not have a bearing on the results. It would be interesting to see how the Dechow and Dichev model performs for different industries. An argument can be made for the model to outperform Jones and Modified Jones models in the Manufacturing and Retail & Wholesale Trade industries, as it better incorporates the short term operating cycle nature of these businesses.

The Dechow and Dichev (2002) model is:

$$\frac{\Delta WC_t}{\overline{A}_t} = a_0 + a_1 \frac{CFO_{t-1}}{\overline{A}_t} + a_2 \frac{CFO_t}{\overline{A}_t} + a_3 \frac{CFO_{t+1}}{\overline{A}_t} + \varepsilon_t$$

Where,

ΔWC_t = Changes in Working Capital at time t.

CFO = Cash Flow from Operations at time t-1, t, and t+1.

ϵ_t = The residual, representing firm-specific discretionary accruals.

And all variables are deflated by average total assets $\overline{A}_t$

Dechow and Dichev (2002) measure accrual quality by the standard deviation of firm-specific residuals. The larger the standard deviation, the lower the quality of accruals.

- **The McNichols Model**

McNichols (2002) identifies a basic distinction between the Jones (1991) and, Dechow and Dichev (2002) models. The Jones model attempts to segregate accruals into discretionary and non-discretionary components, whereas the Dechow and Dichev model looks at accruals as a

whole and does not take into account managerial discretion (discretionary accruals) separately. Also inherent in the Jones model is the assumption that accruals react to contemporaneous sales changes, whereas in fact the adjustment may occur over succeeding periods. Similarly, the estimation errors that are a part of the Dechow and Dichev model can be controlled for, by adding the independent variables that are responsible for affecting non-discretionary accruals, i.e. Sales.

McNichols (2002) proposes a new model for accrual quality by combining both the Jones and DD models. This model has a better power of estimation than the Jones Model and Dechow and Dichev model for her sample and overcomes the misspecification problems.

The model is:

$$\frac{\Delta WC_t}{A_{t-1}} = a_1 + a_2 CFO_{t-1} + a_3 CFO_t + a_4 CFO_{t+1} + a_5 \frac{\Delta REV_t}{A_{t-1}} + a_6 \frac{PPE_t}{A_{t-1}} + \varepsilon_t$$

Where,

ΔWC_t = Changes in Working Capital at time t.
CFO = Cash Flow from Operations at time t-1, t, and t+1.
ΔRev_t = Revenues in year t less Revenues in year t-1.
PPE_t = Property, Plant & Equipment at the end of year t.
ϵ_t = The residual.
A_{t-1} = All variables are scaled by lagged total Assets.

An area of interest in McNichols's model is the dataset. The results are based on a specific industry's sample. This is the 'Manufacturing' industry, according to SIC 4-digit codes for US companies. Some models might be more suited to a particular industry. McNichols (2002) did not test the model on other industries.

- **The Francis Model**

Francis et al (2005) uses the cross-sectional Dechow and Dichev model as well as the variables from the Modified Jones model. The difference between the McNichols model and the Francis

model is that the dependent variable here is Total Current Accruals[26], and all variables are scaled by average assets. Francis et al (2005) find that their model's explanatory power increases from means of 39%, to means of 50% by making adjustments to the original Dechow and Dichev, and Modified Jones models.

$$\frac{TCA_t}{\overline{A}_t} = a_1 + a_2\frac{CFO_{t-1}}{\overline{A}_t} + a_3\frac{CFO_t}{\overline{A}_t} + a_4\frac{CFO_{t+1}}{\overline{A}_t} + a_5\frac{\Delta REV_t}{\overline{A}_t} + a_6\frac{PPE_t}{\overline{A}_t} + \varepsilon_t$$

TCA_t = Changes in Working Capital at time t.

CFO = Cash Flow from Operations at time t-1, t, and t+1.

ΔRev_t = Revenues in year t less Revenues in year t-1.

PPE_t = Property, Plant & Equipment at the end of year t.

ϵ_t = The residual.

$\overline{A}_t$ = All variables are scaled by average total Assets.

2.2 Hypothesis Development

From the literature discussed, and the gaps that this research aims to address, the following hypotheses are formulated.

2.2.1 Hypothesis 1

If a model of accruals quality has information content, and lenders are rational, there should be a significant relationship between accruals quality and tightness of covenant.

The direction of the relationship would depend on the type of covenants used i.e. whether they are set in the *minima* threshold, or the *maxima* threshold. As accrual quality increases, the signal for intervention becomes more useful; covenant threshold is set so that intervention is timely and efficient.

If the predicted relationship is not found, then either the models do not have information content and/or lenders are not rational. The prediction conflicts with Spiceland et al (2015) who use a proxy for tightness that this research does not consider. They reject the use of slack and use two of the models from this research, for accrual quality.

[26] TCA are calculated differently from WC. These are elaborated in the next section.

This research also explores alternate possibilities. It is possible that a missing relation between accrual quality and covenant threshold might also be offset by another set of endogenous variable(s). Interest and Covenant Numbers are evaluated in this regard.

2.2.2 Hypothesis 2

The strength of the relation between accrual levels (magnitude) and covenant variable moderates the hypothesised relationship between covenant threshold and accruals quality.

A test of this hypothesis could help explain the variation in findings on accrual quality, across covenant variables.

2.2.3 Hypothesis 3

Strength of the relationship between covenant threshold and accruals quality is greater for balance sheet covenant variables.

This hypothesis aims to evaluate the findings of Frankel and Litov (2007).

2.2.4 Hypothesis 4

Negative relationship between covenant tightness for balance sheet and income statement covenant variables.

This hypothesis aims to evaluate the findings of Christensen and Nikolaev (2012).

2.2.5 Hypothesis 5

The level of interest rates is significantly related to covenant threshold.

Again, the direction of the relationship would depend on the type of covenants under consideration.

The suggestion here is that the threshold determined by lenders is set simultaneously with interest rates. This would mean that higher interest rates charged on loans would result in relaxed covenant thresholds (and vice versa), making it an endogenous variable. The hypothesis also aims to add material to the literature's endogeneity debate.

2.2.6 Hypothesis 6

Level of interest rates is negatively related to the quality of accruals.

This would mean that an improvement (deterioration) in the quality of accruals results in the cost of debt to be lower (higher).

2.2.7 Hypothesis 7

Level of interest rates is negatively related to the number of covenants.

As discussed earlier, in the extant literature it is observed that higher (lower) interest rates result is fewer (more) additional debt covenants for the borrowers.

2.2.8 Hypothesis 8

Interest rates show an industry effect.

Keeping these hypotheses in mind, we can see that our datasets comprise of three potentially endogenous variables. Interest rates, number of covenants in a loan instrument, and the threshold of debt covenants. The use of simultaneous equations will be employed to address the issue, and make sure that the results are free of bias and errors.

Potential Control Variables

From the literature, it is observed that controls will be required for the size of the borrowing firm, the growth opportunities that it has, its leverage, the industry that it operates in, the state of the economy, volatility of its cash flows, and the levels of its accruals. Other control measures such as the length of the operating cycle of the borrowing firm, and the loan amount are also taken into account.

Potential Estimation Issues

The two main estimation issues will be the definition of covenant tightness, and the endogeneity of the variables[27].

[27] The research addresses both issues with success.

3. Data Collection and Methodology

3.1. Data Collection

The analyses of accrual quality as a determinant of debt covenant slack and covenant thresholds requires data on loan agreements and firm fundamentals. The broad dataset comprises of financial information obtained from Wharton Research Data Services. Secondary data is collected from its two component databases, Dealscan and Compustat, and a supplementary link file.

Dealscan is the largest source of information related to global loan markets, currently encompassing 240,000+ loan deals, since 1987. This document focuses on US[28] loan deal data encompassing twenty years from 1995 to 2015. Two datasets are obtained. The first dataset relates to loan deals during the 1995-2005 period, and the second dataset analyses the 2006-2015 period. Both datasets are analyzed and compared for changes in the use of balance sheet and income statement based covenants over time, how lenders' evaluation of the quality of accruals and interest rates has evolved, and whether there have been oversight changes in line with the literature. The techniques of obtaining the required data from Dealscan are the same for both time periods.

As this study sets out to establish lender efficiency based on the evaluation of a borrowing firm's accrual quality, which has not been tested before, the earliest starting point is chosen. 1995 is the start date because Time Series analyses of accrual quality requires a minimum of 8 years of firm specific data. Loans with debt covenants originating in 1995 will make use of firm information starting from 1988/89. Prior to that period, Compustat has inconsistent and missing firm fundamentals. Also, The Jones Model which is the earliest accrual model analysed in this research, was presented in 1991. Hence a starting date of 1995 for the dataset helps to maintain uniformity with earlier research and literature, and the end point of 2015 assures comparability and robustness of results, compared to recent literature related to financial accruals, lender-borrower relationships and loan covenants.

Dealscan's 'Package' sub-module contains detailed information related to loan agreements. Filtering the sub-module for loan deals during the 1995-2015 period gives 113,143 loans. Each loan's information is then checked for the existence of comments, with details provided for

[28] US datasets have been used by Dechow and Dichev (2002), Wysocki (2009), Perotti and Wagenhofer (2014).

27,922 loan deals. Entries containing financial covenants are then manually highlighted and separated from the sample, which brings the size down to 5,955 loans.

These loan agreements are then checked for the required financial covenants manually: Current Ratio, Quick Ratio, Leverage Ratio, Interest Coverage Ratio, Debt to EBITDA Ratio, and Debt to Tangible Net Worth Ratio. Out of the 5,955 loan deals, 2,888 agreements contain the requisite covenants. Multiple loans by the same company are included in the sample because loan issue rather than the company, is the unit of analysis. Agreements with a negative initial debt covenant 'slack' are part of the sample as well. Demerjian and Owens (2014) exclude such firms. The reasons for the inclusion of such deals are addressed in the next section.

As the study requires information on borrowing firms and their company fundamentals, this research makes use of Chava and Roberts' (2008) Dealscan-Compustat Link file[29]. The file helps researchers match borrowing firms from the Dealscan database, to their corresponding fundamentals on the Compustat database. Out of the 2,888 loan deals, the link file does not have information on 303 borrowing firms (346 loan deals). This brings the sample to 2,541 loan agreements (1,872 borrowing firms).

'PackageID' is a unique Dealscan database variable associated with each loan obtained. 'BCOID' is another variable in Dealscan that refers to the Borrowing Company ID. Two loan deals by the same borrower may have the same 'BCOID' but will have unique 'PackageIDs'. 'GvKey', or Global Company Key is a unique six-digit number that is assigned to companies in the Compustat database.

The specific method used to merge the two databases for this study is as follows:

- 'BCOID' is available in Dealscan as well as on Chava and Roberts' (2008) Link File.
- 'GvKey' is available on the Link File and Compustat.
- 'BCOID' is used to identify borrowing firm Global Company Keys on the Link File, which are then further exported to Compustat for data extraction.
- 'PackageID' is used as a unique identifier for each loan on the exported sheets.

During the course of this particular data collection stage, a situation of multiple GvKeys for the same borrower from the Link File was encountered. This was primarily found to be a result

[29] Available on the WRDS Dealscan database, and for academic use at http://finance.wharton.upenn.edu/~mrrobert/styled-9/styled-12/index.html

of M&A activities, and discontinued operations for a limited period of time. Keeping the Dealscan loan inception date as a guideline here, the chosen GvKeys were ones that were nearer the loan activation date.

The Compustat database was used for acquiring information related to company financials. Comprising numerous financial, statistical and market segments, Compustat North America's 'Fundamentals Annual' sub-module was utilized.

Out of the 1,872 borrowing firms identified, Compustat did not have matching results with GvKeys for 79 companies. This truncated the sample to 1793 borrowing firms. Furthermore, Standard Industry Classification (SIC) codes were identified for all companies, and 118 firms from the financial sector (6000 - 6999 SIC)[30] were removed from the sample, resulting in 1675 available companies.

Dealscan did not have enough information on the spread over the default interest rates charged, for 65 loans. Those were omitted from the sample. Finally, the last step was to check for the availability of all the required financial information for 8 consecutive years. This is done to perform the time-series analyses underlying some of the accruals quality, and cash flows volatility calculations. As the earlier loan deals in this research are from 1995, the data requirements are stringent with dates stretching to 1987. As Compustat does not have detailed information from that time period on company financials, the final sample is brought down to 973 loan deals across 709 borrowing firms, with 7,784 firm years of data available.

Firm fundamentals and variables that are derived from them, through the Compustat Database, are listed below:

Sr. No.	**Firm Fundamentals**	**Compustat Codes**
1	· Accounts Receivables – Total	Data item 2.
2	· Inventories – Total	Data item 3.
3	· Current Assets – Total	Data item 4.
4	· Current Liabilities – Total	Data item 5.
5	· Assets – Total	Data item 6.

[30] Financial firms are excluded because high leverage is a norm for these companies. Increasing leverage for non-financial firms are likely to lead to distress (Fama and French, 1992). The reporting environment for industrial and financial institutions differ. Also, their accrual processes are vastly different (Peasnell et al, 2000)

6	· Property, Plant and Equipment	Data item 7.
7	· Long-Term Debt – Total	Data item 9.
8	· Sales	Data item 12.
9	· Operating Income Before Depreciation	Data item 13.
10	· Depreciation and Amortization	Data item 14.
11	· Interest Expense	Data item 15.
12	· Income Taxes – Total	Data item 16.
13	· Income Before Extraordinary Items	Data item 18.
14	· Price – Close – Annual	Data item 24.
15	· Common Shares Outstanding	Data item 25.
16	· Intangible Assets	Data item 33.
17	· Debt in Current Liabilities	Data item 34.
18	· Cost of Goods Sold	Data item 41.
19	· Common Equity – Total	Data item 60.
20	· Amortization of Intangibles	Data item 65.
21	· Account Receivables – Estimated Doubtful	Data item 67.
22	· Accounts Payable	Data item 70.
23	· Income Taxes Payable	Data item 71.
24	· Common Stock	Data item 85.
25	· Cash	Data item 162.
26	· Net Income (loss)	Data item 172.
27	· Liabilities – Total	Data item 181.
28	· Selling, General and Administrative Expense	Data item 189.
29	· Stockholder's Equity – Total	Data item 216.
30	· Cash and Cash Equivalents – Increase (Decrease)	Data item 274.
31	· Cash Flow from Operations	Data item 308.

Sr. No.	Variable	Formula Identified and Adopted for Analysis Purposes
1	Net Receivables	Accounts Receivables – Estimated Doubtful.
2	Market Capitalization	Common Shares Outstanding times Price – Close – Annual
3	Book Value	Total Assets minus Total Liabilities
4	Market to Book Ratio	Market Capitalization over Total Book Value.
5	Leverage	Total Liabilities over Total Assets.
6	Total Current Accruals[31]	Δ Current Assets minus Δ Current Liabilities minus Cash and Cash Equivalents – Increase (Decrease) plus Δ Debt in Current Liabilities.
7	Working Capital Accruals[32]	(Current Assets less Cash) minus (Current Liabilities less Debt in Current Liabilities)
8	Average Assets	(Opening Assets plus Closing Assets) over 2
9	ΔRevenue	Δ Sales
10	ΔWorking Capital[33]	Δ Accounts Receivables plus Δ Inventories minus Δ Accounts Payable minus Δ Taxes Payable
11	Total Accruals[34]	Income Before Extra Ordinary Items minus Cash Flows from Operations
12	EBITDA	Sales (Net) minus Cost of Goods Sold minus Selling, General and Administrative Expenses
13	Current Ratio	Current Assets over Current Liabilities
14	Quick Ratio	(Current Assets less Inventory) over Current Liabilities
15	Leverage Ratio	Total Liabilities over Total Common Equity
16	Interest Coverage Ratio	Earnings Before Interest and Tax over Interest Expense

[31] For the Francis Model.
[32] For the Peasnell Model.
[33] For the Dechow and Dichev Model.
[34] For the Jones and Modified Jones Models.

17	Debt to EBITDA Ratio	Total Liabilities over EBITDA
18	Debt to Tangible Net Worth Ratio	Total Liabilities over (Total Assets less Total Liabilities less Intangible Assets)

Analyzing past literature, one or two financial ratio based debt covenants are observed to be chosen for debt covenant related studies. The Current Ratio and Net Worth ratio are widely preferred. This is because their definitions are easy to understand and compute, and do not vary vastly from one customized loan deal to another. But it also leaves the literature devoid of the impact of added variables; whether lenders look at multiple covenants as complements or substitutes, and if there really has been a change in focus caused by the shift towards fair value accounting processes. To address the issue, this research standardizes covenants, and assesses the impact of accrual quality on Current Ratio, Quick Ratio, Leverage Ratio, Interest Coverage Ratio, Debt to EBITDA Ratio and Debt to Tangible Net Wort Ratio based debt covenants. According to Demerjian and Owens (2014) the standardization of financial covenants does not result in any significant change to overall results, even though some firms might be employing a slightly different definition over the standardized ones.

A simple example of the need for standardization can be taken from the Leverage Ratio. One definition of Total Liabilities may include the *Long Term Liabilities* component only, while another definition may take Total Liabilities as *Current Liabilities plus Long Term Liabilities,* and yet, another definition may be *Long Term Debt in Current Liabilities plus Long Term Liabilities.*

3.2 Methodology

3.2.1 Research Philosophy

The aim of this research is to fill the gaps related to the understanding of lender-borrower relationship at loan inception, and how that relationship is impacted by evaluation techniques and quality of accrual earnings.

Research philosophy tells us how researchers undertake philosophical assumptions in order to gather information about a specific topic, study it, and how those resulting analyses should be used. The established systems that we choose from the extant literature on a particular subject

will affect the choices that we will need to make throughout the course of the research. Generally, research aims to transition from what is believed to be true, to what is known to be true. The former is known as *Doxology* and the latter is known as *Epistemology*.

Whenever a new research project is undertaken, there are certain assumptions that are made which are sometimes implicit to the research. For example: lenders evaluate risky borrowers in a sophisticated manner and give them strict terms and conditions to comply with. The basic underlying assumption here being that risk is something real, and that there are both risky as well as non-risky borrowers in the market. This is known as assuming *Ontologically*. Furthermore, we are also assuming that the relationship between lenders and borrowers can be evaluated in a coherent and productive manner. That a component of earnings, in the form of accruals, forms the basis of a lender's opinion about the riskiness of a borrower. We are assuming that by researching and getting to know these things, something robust, concrete, and meaningful can be added to the literature on the topic. This is known as *Epistemological Assumptions,* where something can be "known". *Axiological Assumptions*, which comes from the Ancient Greek word of "*axioma"* meaning 'that which is thought fitting/worthy', deals with the research assuming that it is meaningful to seek answers to lender and borrower relationships, and that there is a set way of going about performing this task. And then, we have the *Methodological Assumptions*, which as the name suggests that the research assumes there will be some methods of data collection, sorting, analysis, and presentation that will be acceptable, while some methods will not be adequate for the research at hand.

There are two major streams of prevailing research philosophies that are followed by those seeking knowledge and answers. These two paradigms are called Positivism and Interpretivism.

Positivism, also known as Logical Positivism, is a philosophy that states that knowledge can only be tested, confirmed, and obtained through empirical analyses and evidence. Only an idea that can be proven mathematically, scientifically, or logically, holds value and adds to our knowledge base. Furthermore, Positivism states that the validity of a finding or result is contingent upon it being repeatedly observable, with multiple studies and research arriving to conclusions like the original findings. Hirschheim (1985) states that this philosophy is so inculcated into our societal structures that any claims or findings that do not have a positivist backing, are thought to be invalid and inaccurate.

Positivism then leads to the following assumptions. Under Ontological Assumptions, the nature of reality is fixed. It can be observed, and we can measure it. For example, risky borrowers from an earnings-accruals perspective, have a deviating relationship with lenders, compared to non-risky borrowers. If we measure the information contained in earnings-accruals correctly, we will be able to establish either a stringent, or relaxed/loose relationship between lenders and borrowers. The Epistemological Assumption here is that any reliable information must be quantifiable in absolute terms, and be objectively addressed. Researchers can only add to the theory-base if their results are objective and quantifiable. This is primarily the reason why Logical Positivist research is quantitative in nature. From our example, the information derived from borrowing firms' financials, and lender's evaluations[35], is objective. They can be mathematically and statistically measured, and the results derived from them can be proven. This adds to current literature, and hence is useful knowledge. The Axiological Assumption would be earnings-accruals and financial covenants giving us clear and objective results on lenders' evaluation of borrowers at loan inception, which is axioma – or worthy of being an addition to knowledge. The Methodological Assumptions under Positivism would be specific financial, statistical and econometric techniques to conduct the research. For example: Which accrual models to use. When to use Ordinary Least Squares analyses and when to adopt Two-Stage Least Squares. Identifying endogenous and exogenous variables. Identifying correct hypothesized relationships from regressions etc.

Interpretivism, also known as Anti-Positivism, is the opposite of Positivism in that the philosophy signifies that reality can be unveiled through a subjective interpretation. As most of the research conducted in this vein of philosophy is qualitative in nature, it is established that this research will primarily focus on the Logical Positivism philosophy.

3.2.2 Covenant Slack

Debt Covenant Slack is a way of measuring the tightness of financial covenants that have been imposed on borrowers, by lenders. The adverse selection problem faced by lenders that was discussed earlier, suggests that there will be high (low) slack levels in situations where the borrower is evaluated to be safe (risky). Debt Covenant Slack mainly comprises of two variables for its formulation. These are the Financial Variable of the company, and the

[35] In the form for financial covenants.

Covenant Threshold that has been set for that variable by the lenders. It is important to mention here that the interpretation of Debt Covenant Slack depends on the minima and maxima types of covenants used.

Dichev and Skinner (2002) define covenant slack for their study as the actual realisation of the borrowing firm's financial variable, minus the covenant threshold. The study only focuses on two minima covenants; Current Ratio and Net Worth Ratio. They report a strong negative relationship between a technical default and covenant slack at loan inception. On the other hand, the firm's Current Ratio standard deviation and Covenant Slack are seen to exhibit a positive relation. But similar analyses for Net Worth Ratio show weak results. The slack variable is formulated as:

$$Slack \equiv financial\ variable\ -\ threshold$$

The reason for conflicting results from the study may be down to the way the covenant slack variable is determined here. For example, if the Current Ratio for the borrower is 3.5, and the lenders set a minimum Current Ratio Covenant of 2, then by description the borrower would have received a positive covenant slack of 1.5. But what if the same covenant slack metric is applied to a maxima based covenant threshold? For example, lender sets a maximum Leverage Ratio Covenant of 20%, and the firm's actual Leverage Ratio is 35%. By definition here, we would end up with 15%. As this is positively signed, that may be interpreted as a slack of 15%. But in fact, the borrower is in technical default at loan inception, and needs to bring down Leverage Ratio by 15% to stay within the covenant threshold. This suggests that the definition of slack variable is mis specified and cannot be generalized for covenants, which is probably why Dichev and Skinner (2002) get weaker results from their sample.

Frankel and Litov (2007) base their covenant slack formulation on Dichev and Skinner (2002). But the change that they make to the calculation is that they scale Financial Variable by Covenant Threshold and take its natural log (ln). This overcomes the misspecification that is evident in the Dichev and Skinner (2002) analysis, when maxima-based covenants are analysed through the same metric. The Slack variable is formulated as:

$$Slack \equiv \ln\left(\frac{financial\ variable}{threshold}\right)$$

Adopting this model results in the slack variable having the correct directional signs, for both minima and maxima-based covenants. However, Frankel and Litov's (2007) analysis does not include maxima-based covenants. The covenants that are analysed are Current Ratio and Net Worth covenants. They find that there is no significant relationship between discretionary accruals and debt covenant slack. The study also fails to establish a strong link between debt covenant slack and timeliness (asymmetric timeliness) of earnings. This suggests that the metrics being employed by the studies have weak, and inconsistent explanatory power.

Janes (2011) incorporates both Dichev and Skinner (2002) and Frankel and Litov (2007) into the metric for determining debt covenant slack. This is achieved by subtracting financial variable and the covenant threshold, and then scaling it by the covenant threshold again. Apart from the fact that the study on analyses the (minima-based) Current Ration Covenant, it can also be seen that the slack determinant variable suffers from the incorrect sign misspecification problem, when a maxima covenant is calculated through it. The slack variable is determined through the equation:

$$Slack \equiv \frac{financial\ variable\ -\ threshold}{threshold}$$

If we are to assume that a borrower has an actual Leverage Ratio of 40%, and the leverage ratio covenant mandates the borrower to maintain maximum leverage ratio of 20%, then through this metric it is determined that the lender has given the borrower a covenant slack of 100%. Which is incorrect, as the slack is not even positive to start with. The mis specification of the slack variable results in the study presenting inconsistent conclusions, where the results of the univariate and multivariate tests cannot be reconciled. It is observed that high levels of accruals and tightness of debt covenants have no relation. What is even more puzzling is the finding that extreme accruals firms are charged higher interest rates by lenders. That means both high *and* low level accrual firms get charged more. Intuitively, higher accrual firms may get charged more due to the perceived volatility of larger magnitudes, but the same cannot be said about firms with low level of accruals and bigger chunks of earnings in cash – leading to more stable

earnings persistence. As discussed earlier, increasing earnings persistence is usually seen by lenders as a positive sign.

Demerjian and Owens (2014) analyse the strictness of financial covenants in loan contracts. They introduce a new measure for formulating covenant slack, where the actual firm ratio is divided by the covenant threshold set by the lenders i.e.

$$Slack \equiv \frac{financial\ variable}{threshold}$$

Unsurprisingly, the research finds that there is no relationship between the Net Worth Covenant Slack and the technical default of a borrower. Considering that the literature has conflicting, and at time contrasting results from studies that involve the slack metric, maybe the issue lies in the assumptions for the calculation of the slack variable itself. This is explored and addressed next.

3.2.3 Covenant Threshold

Many measures of covenant tightness are constructed from the covenant threshold relative to the value of the corresponding financial variable at loan inception, dubbed 'slack'. Financial variable (FV) at loan inception is not a decision variable for the lender. It is a noisy signal of the probability of default on the loan. It may, however, be influenced via managerial discretion prior to a future loan.

The slack variable is measured by different permutations of covenant threshold and the value of the financial variable (on part of the borrowing firm) at loan inception date. Since it is possible that financial ratios at loan date are imperfect representations of the true state of the firm[36], it may provide noisy estimates. Also, negative slack observations at loan inception is not uncommon, given the 'normal' fluctuations inherent in accounting variables. Risk is intrinsic to business. 'Normal' fluctuations can be endured by the lender. They represent risk, but not necessarily risk of default on debt. Intervention has no expected benefits in the event of 'normal' fluctuations, which should be filtered out whenever possible to save wasteful costs of intervention. The greater the 'normal' operating risk, the larger the amount of slack allowed

[36] Debt Covenant Hypothesis.

to the borrower. Another reason why a loan might be issued with a covenant which brings it into technical default is that a covenant breach is an *'intervention point'*[37] for the lender, and not a default point. Intervention provides expected benefits, but also costs to the lender. The economic question thus arises as to where to set the legal intervention point, the covenant threshold. The customary answer is, where the expected benefits less expected costs to the lender are maximized. The lender has no incentive to intervene at the loan date, given that negotiations have simultaneously been concluded, but it may wish to maintain a tight threshold going into that loan period. Since the focus of the lender is on the intervention point, which is the Covenant Threshold, there is an argument for focusing the analysis on threshold alone, rather than covenant slack.

It is important to distinguish risk of technical default from default in debt service. The former is a risk for the borrower, and an intervention point for the lender. The latter is a risk of loss for the lender. When the focus of research is on borrower behaviour, it is valid to focus on current covenant slack. Given the covenant slack, the borrower can take decisions to influence the covenant variable to avoid technical default. However, when the focus is on lender behaviour, the focus should be on the covenant threshold. Actual accounting numbers are not in the decision set of the lender, but the covenant threshold is. Any decision by the lender on covenant threshold implies an initial value for slack, given the current accounting numbers. This does not mean, however, that slack should be the dependent variable in a study on lender behaviour.

Consider two firms with identical risk of default, but with different initial values for the financial variable. Should they have the same covenant threshold, or the same initial slack, and therefore different covenant thresholds? The lender should not give equal initial slack to the two borrowers when there is equal risk of default on debt service, because this would imply different thresholds (points of intervention). Since technical default imposes costs on a borrower, slack is analogous to the current intrinsic value of an American option held by the lender, except that the payoffs are not a zero-sum game due to costs of renegotiation. The 'exercise price' is equivalent to the covenant threshold. If costs to the borrower were fixed, the option would be a cash-or-nothing option, and if they were a determinate function of an underlying asset, it would be an asset-or-nothing option. The costs are not contractual,

however, which makes analysis more problematic. Since technical default allows intervention by the lender to secure its position, which involves both benefits and costs to the lender, setting the covenant threshold (or point of intervention or 'exercise price') is an optimization problem to obtain the greatest net benefits.

By definition, an excessively strict covenant threshold imposes costs on the lender without securing any benefits from reduced risk of default in debt service, while an excessively lenient threshold saves costs of intervention, but fails to secure benefits from securing a lower risk of default on debt service. Deviation from the optimum threshold for a particular borrower implies a higher or lower interest rate to recover the difference between the actual and greatest net benefits.[38]

In the Covenant Slack calculation, covenant threshold is a decision variable for the lender, while actual firm ratio at time of loan issue is not. This suggests covenant threshold should be the dependent variable. However, it is also true that given a value for the actual firm ratio at loan issue, any covenant threshold decision can be equivalently stated in terms of a decision on covenant slack simply by deducting the exogenous value of the firm ratio at loan issue. Choice of a covenant variable suggests that future values of this variable are a useful signal of risk to the lender. Hence, rather than being a decision variable, actual firm ratio at loan issue is a signal of future lender risk. It *should* therefore influence the covenant threshold decision, the chosen point at which the lender has the option to intervene to safeguard its interests, as an independent variable.

The focus of this research will be on the Covenant Threshold (CT) component, rather than on Slack (S). But for the purposes of robustness, estimations will be carried out for slack as well.

In a linear model,

$$CT = \beta_0 + \beta_1 FV + \cdots$$

where $\beta_1 \neq 0$

If $\beta_1 = 1$, then

$$CT - FV = S = \beta_0 + \cdots$$

Thus, there are 2 null hypotheses for FV:

[38] Which is one of the primary motives to include the Interest variable in the regression models.

$\beta_1 = 0$

$\beta_1 = 1$

It is expected that covenant threshold will be affected by the initial value of the financial variable, but a coefficient on the relationship is not imposed. Covenant Threshold being a function of the actual firm financial ratio at the time of loan inception. In the next chapter, this research empirically supports this hypothesised relationship.

A practical robustness check in the form of mathematical proof follows:

An example of the misspecification test for the covenant variable at the time the loan is granted can be taken from Leverage Ratio's Stage 1 Analysis through the Modified Jones Model. The estimated coefficient is 0.001. The t-ratio is (0.001-0)/standard error = 0.115. Therefore, the standard error is 0.001/0.115 = 1/115. The specification test is then (0.001-1)/(1/115) = -114.885. Obviously, this is significant. Hence the estimated coefficient is significantly different from one and the slack model would be mis specified.

3.2.4 Risk of Default

Risk of default is a control variable. It is measured by the two variables σ_{CF} and σ_A. These represent the fluctuations observed through time series analyses of Cash Flows and Accruals, respectively.

- Time-series volatility of cash flows (σ_{CF})
- Time-series volatility of accruals (σ_A)

This research does not incorporate other variables that proxy for default risk, such as the Altman's Z Score metric, for numerous reasons. Firstly, Cash Flows and Accruals both make up the two components of Earnings. The time series analyses of these two variables helps us to establish the extent of Earnings persistence. Secondly, using a metric such as the Z Score, does not provide separate relationships between its component variables[39] and the Left-Hand Side dependent variable in regressions, but provides one as a whole for the metric. This research wants to find out how volatility of Cash Flows and Accruals can affect dependent variables,

[39] These are Working Capital/Total Assets, Retained Earnings/Total Assets, Earnings Before Interest and Tax/Total Assets, Market Value of Equity/Total Liabilities, Sales/Total Assets.

and whether lenders take *these* specific variables into account while setting the values of Covenant Threshold, Interest Rates, and Number of Covenants into loan contracts. The volatility of Cash Flows and Accruals is also expected to effect Accrual Quality. Furthermore, from a robustness point of view, time series evaluations are less noisy compared to a specific-year evaluation. σ_{CF} and σ_A take 8 years observations of the variable, each, to substantiate a level of risk of default. Whereas the Altman's Z Score metric only relies on variables from 1 year's financial information, which can be a noisy estimate of the volatility of the firm. Lastly, for comparability with prior literature on accruals and financial loan covenants, components of Earnings are chosen to represent the risk of default.[40]

Risk of default is likely to be positively related to benefits of intervention and therefore covenant tightness. This research does not use volatility of earnings as a control, which is implicitly related to the included variables via the equation:

$$\sigma_{\pi}^2 = \sigma_{CF}^2 + \sigma_{\Delta A}^2 + 2\sigma_{CF,\Delta A}$$

The risk to the lender is related to lack of cash, rather than lack of earnings, and accruals are advanced or retarded cash flows. We do not assume the impact of σ_{CF} and σ_A on CT to be the same, which would be the implicit assumption if σ_{π} was used as the control for risk of default. We also do not use volatility of sales and volatility of working capital, which will also be strongly related to our two included measures. The problem of potential multicollinearity between excluded and included variables is not an important one here, because the included variables function as control variables and their coefficients are not of primary interest. Note there is some ambiguity in accruals models about what is to be explained. Some models try explaining accruals levels and some try explaining accruals changes. An accrual can be viewed as a future cash flow.

3.2.5 Accrual Variables

A rationale for allowing different impacts on CT of σ_{CF} and σ_A is that accruals are *predictions* rather than *realisations* of cash flows, with consequential additional uncertainty as a signal of risk of default. The stronger the relationship between accruals and cash flows, the greater is *accruals quality* (AQ) (Dechow and Dichev, 2002). We expect accruals of low quality to have

[40] See for example, Dechow and Dichev (2002).

less impact on CT than accruals of high quality. Hence there should be a positive relationship between AQ and covenant tightness. This hypothesis conflicts with the conclusion in Spiceland *et al* (2015) but is consistent with Frankel and Litov (2007) and Francis et al (2005).

The two accrual variables, σ_A, and accruals quality, AQ, are drawn from time-series regressions of either total accruals or working capital accruals, using the following models: The Jones Model (Jones, 1991); The Modified Jones Model (Dechow et al, 1995); The Peasnell Model (Peasnell, 2000); The Dechow and Dichev Model (Dechow and Dichev, 2002); The McNichols Model (McNichols, 2002); The Francis Model (Francis et al, 2005). The regressions use continuous observations of 8 years from the year prior to loan inception.

These regression models are of the form:

$$A_t = \hat{A}_t + \hat{\varepsilon}_t$$

Where,

$\hat{A}_t \equiv$ model-specific *predicted* accruals

$\hat{\varepsilon}_t \equiv$ model-specific *predicted* residual

For example, a practical representation of the above equation can be the Dechow and Dichev (2002) Model:

$$\frac{\Delta WC_t}{\overline{A}_t} = a_0 + a_1 \frac{CFO_{t-1}}{\overline{A}_t} + a_2 \frac{CFO_t}{\overline{A}_t} + a_3 \frac{CFO_{t+1}}{\overline{A}_t} + \varepsilon_t$$

Depending on the model, A_t might be working capital or total accruals. The caret above a letter, for example $\hat{A}$, distinguishes an estimated or predicted value from the corresponding realised value. Some models have accruals changes on the left-hand side.

This research adopts the standard deviation of the regressand as our measure of σ_A, and the adjusted coefficient of determination as our measure of accruals quality: $AQ = \overline{R}^2$. Separating out the residual $\hat{\varepsilon}_t$ removes accruals that either cannot be explained by normal operations or that bear no relationship to cash flows. Previous studies, for a variety of research objectives, have focused on the error or standard error of the accruals regression. This would provide an

inverse measure of accruals quality, which could be converted to a positive measure by taking its reciprocal. This research sees no reason to do this when there is a direct measure available.[41]

Since covenant variables differ in sensitivity to accruals, the following time series is estimated:

$$Corr(FV, A)$$

for the eight years prior to loan inception and include this as an interaction variable in the regression: $Corr(FV, A) \times AQ$. This allows the moderating effect of $Corr(FV, A)$ on the relationship between CT and AQ to be estimated for testing Hypothesis 2.

3.2.6 Interest Rates

Borrowers can negotiate lower interest rates in return for more and tighter covenants. Hence CT, N and I are jointly determined, where N denotes the number of covenants, and I denotes the spread charged by the lender over the base interest rate. The spread indicates risk to lender. The base rate indicates general time preferences and does not reflect borrower-specific risk.

3.2.7 Multiple Debt Covenants

Focus on the quality of the accounting signal, distinct from 'normal' risk and risk of default, allows a rationalisation of multiple signals being used in conjunction. Where signals are substitutes, multiple signals might not be useful and should seldom be observed, but where signals are complements, multiple signals might be useful and should be frequently observed.

The covenant threshold for any one kind of accounting ratio may be influenced by the simultaneous setting of covenant thresholds for other accounting ratios, both substitutes and complements. For instance, a covenant threshold may not need to be set as rigorously on one variable if there is already a rigorous threshold on a substitute accounting variable. Financial covenants can be grouped into Working Capital covenants such as the Current Ratio and Quick Ratio, and Debt related covenants such as Debt to EBITDA and Debt to Net Worth ratios, Interest Coverage Ratios and Leverage ratios. Do covenants within a group[42] act as substitutes to each other, and complement covenants in other groups? This research will shed light on it. If there is a significant relationship between different substitute covenants, it is assumed to be negative because of the overlapping of information.

[41] To my knowledge, this is novel and has not been adopted in any other studies.
[42] Grouping might also be based on covenants being set in the 'minima' and 'maxima' thresholds. The empirical evidence will be discussed in the next chapter.

3.2.8 Other Control Variables

The following control variables are added to our analyses as independent variables. These variables will be used for Stage 1 and Stage 2 regressions of Two Stage Least Squares estimations.

- Firm Size (FS) = Log of Total Assets. (Wald, 1999. Mackay and Phillips, 2005)

Firm size is included as a separate variable instead of controlling by using ratios, which is effective only when the size effect is strictly proportional (Lev and Sunder, 1979). Bradley and Roberts (2004) find that Firm Size is negatively related to the number of covenants in a loan instrument, indicating that Firm Size is a substitute for covenants.

- Loan Amount (LA) = Loan Amount scaled by Total Assets (Bradley and Roberts, 2004).

Loan amounts (or facilities) that have been borrowed, are seen to have a significant effect on the covenant violations in loan deals (Demerjian and Owens, 2014).

- Operating Cycle (OpCycle) = $360 \times \left(\frac{average\ receivables}{sales} + \frac{average\ inventory}{cost\ of\ good\ sold} \right)$. (Dechow and Dichev, 2002)

Operating cycle measures the average time elapsing between the disbursement of cash to produce a product and the receipt of cash from the sale of the product (Dechow, 1994). The longer the operating cycles of a company, the more volatile will be its earnings, and the resulting cash flows and accruals. Which is not perceived in a favourable manner by lenders.

- Growth (G) = market/book ratio (Bradley and Roberts, 2004)

Private debt holders have great growth opportunities, are smaller in size, have low tangible assets, and experience cash flow volatilities. They also have more debt covenants written into their loan agreements, when compared with Public debt holders. (Bradley and Roberts, 2004)

- Leverage (LE) = total liabilities/total assets (Bradley and Roberts, 2004)

For studying the covenant threshold for leverage, the inclusion of FV makes this control redundant. We see from the literature that increasing leverage results in lenders adding covenants to the loan instrument, to safeguard their interests. High leverage levels at the time of loan inception, signal higher chances of technical default and bankruptcy (Bradley and Roberts, 2004).

- Recession dummy (D_{REC}) (Bradley and Roberts, 2004)

The recession dummy takes a value of one when there is a formal recession, 0 otherwise. The months of recession in the US can be taken from the Federal Reserve Bank of St. Louis's website[43]. All control variables are measured at loan inception.

- Managerial Ability

Taking the skillset of the Manager into account when setting the covenant threshold at loan inception, may introduce bias into the regression models due to two main reasons. Demerjian et al (2013) study managerial ability, and report limitations through use of proxies for managerial ability, suggesting that there may be omitted correlated variables because of proxy usage. Also, it is hard to disentangle and quantify a specific managerial role's performance (for example, CFO) from that of the entire management team, which again results in a biased measurement. Furthermore, Managerial Ability is not taken as a control variable for our estimations because of comparability with the current literature, as well as the fact that it is beyond the scope of this research. The estimations will nevertheless be unbiased if either the relationship between managerial ability and covenant threshold is weak or if managerial ability is uncorrelated with the variables included in the model.

3.2.9 Industry Effects

Industry dummies are added to each regression. 4-digit industry SIC code is assigned to each borrower: D_{SICi}. This will help in analysing whether certain debt covenants are more prevalent from an industrial perspective. For each SIC code, let dummy =1 if borrower is from that

[43] Available at: https://fred.stlouisfed.org/series/JHDUSRGDPBR

coding, 0 otherwise. Dummy for one SIC code is omitted to avoid perfect multicollinearity with the intercept term.

3.2.10 Endogeneity

In Panel Data analyses or Pooled Cross-Sectional studies, the Hausman Test helps to identify the endogenous variables in the models and opting for fixed effects or random effects modelling. But as this research has two separate measures of analyses, with one being strictly time-series, and the other being cross-sectional analysis, the standard Hausman Test does not apply. For this reason, we identify variables from the literature that have already been identified as endogenous to the models applied[44], and introduce a new endogenous variable[45] based on the theoretical discussions in the preceding chapters. Then, structural equations are introduced that are based on the Hausman procedure, to separate the effects of the endogenous variables. Two-Stage Least Squares analyses are carried out to address the endogeneity, and use predicted values from the equations to cure any concerns of biased error terms. The procedure has been implemented in the literature by Frankel and Litov (2007).

Covenant Threshold (CT), Interest rate (I), and Number of Covenants (N) are endogenous variables. A loan might also have multiple covenants written on financial variables, with the set of thresholds being jointly determined. The number of endogenous variables equals number of covenant thresholds plus 2, i.e. if we look at CT, then the endogenous variables will be Interest (I), plus Number of Covenants (N), plus 'x' number of additional covenants written into the loan instrument.

Estimation by 2SLS: first stage reduced-form equation estimation is used to identify exogenous variables that can safely be omitted from corresponding structural equations to satisfy the order and rank conditions.

The second stage will employ dummies for covenant type: $D_{CR}, D_{QR}, D_{LR}, D_{ICR}, D_{DEbitda}, D_{DTNW}$, with $N = \sum_i D_i$ for each loan

3.2.11 Diagnostics

[44] Interest and Number of Covenants.
[45] Covenant Threshold.

Diagnostics are carried out for our samples to cover the multicollinearity, heteroskedasticity and normality of distributions issues.

- Multicollinearity

Multicollinearity is assessed using Variance Inflation Factors (VIF). The problem of multicollinearity arises when there are correlations between the independent variables in a model. VIFs are calculated for each independent variable by regressing them against all the other independent variables. A VIF of 1 means there is no correlation between variables, with the value increasing as correlation increases.

- Heteroskedasticity

Heteroskedasticity refers to an uneven scatter in the residuals or the error terms, in regressions. To be able to trust the results of analyses, and make sure they are not skewed and biased, residuals must have constant variance. The Breush-Pagan test is used to detect for heteroskedasticity. If the significance or p-value of the test is less than 5% ($p < 0.05$), then we discard the null hypothesis of a homoscedastic result and assume heteroskedasticity.

- Normality

Normal distributions refer to the probability distributions, that appear as a 'bell curve'. They are symmetric around the mean. Ideally, the mean has a value of 0, and the standard deviation of the distribution is 1, with Kurtosis of 3 and Skewness of 0.

Although normality is desired, it is not an implied assumption for our analyses. Non-normal distributions do not produce biased estimates in our tests.

Normality in this research is analysed through the Kolmogorov-Smirnov and Shapiro-Wilk tests. If the significance or p-value of the test is less than 5% ($p < 0.05$), then we reject the null hypothesis of a normal distribution and assume that the data is not normally distributed.

3.2.12 Testing

When we are faced with the problem of endogeneity in OLS, 2SLS is used. 2SLS is considered to be an extension of the OLS method. Endogeneity arises when the explanatory variable(s) are correlated with the error terms. Three Stage Least Squares combines SUR (Seemingly Unrelated Regression) with Two Stage Least Squares analyses. 3SLS is an extension of the

2SLS method. Since the models discussed above had the endogenous variables identified, and the aim is to address endogeneity, this research incorporates the 2SLS approach specifically. Furthermore, Zellner and Theil (1962) state that the 3SLS and 2SLS estimates are similar if the variance-covariance matrix is diagonal, of the structural/system disturbances. Also, if all equations are just-identified, then 2SLS will be equal to 3SLS by equation. The issue of correlated disturbances across structural equations, which might justify the use of three-stage least squares, has not been explored. Instead, a parsimonious approach has been employed.

Once data generating process has been identified, estimation of structural equations will be iterative, from general to specific, dropping insignificant variables and then re estimating. There are a total of six covenant threshold variables, plus interest rates and number of covenants. Six accruals models are utilized for the analyses.

- Two Stage Least Squares

For each reduced-form equation, insignificant variables are noted that can be omitted *in the corresponding structural equation* to satisfy the order and rank conditions. The explanation for why this adjustment needs to be made in the corresponding structural equation, follows.

Consider a situation where no variables were left out in the second stage. Then the problem arises that the set of exogenous variables are the same in the two equations for the endogenous variables (threshold (CT), interest rate (I) and number of covenants (N)). The predicted values for CT, or I, or N from the first stage are from an exact linear function of the exogenous variables used in the second stage. Hence there will be perfect collinearity.

All two stage least squares estimations must have differences between the set of exogenous variables specified to affect the endogenous variables[46]. In particular, the set of exogenous variables affecting interest rates must not be a subset of the set affecting covenant threshold. If these adjustments are not made manually, then statistical software packages make them automatically, by expelling the variables with the smallest coefficients and avoiding perfect collinearity. But since the software is applying purely statistical criteria for expulsion, we get arbitrary and inconsistent expulsions across models and covenants. We, rather than the software, should specify in advance the set of independent variables that should affect covenant threshold on the one hand and the set that should affect interest rate on the other. One of the variables explaining interest rate must be excluded from the equation explaining covenant

[46] See Maddala 2001: 348-352.

threshold to avoid perfect collinearity in the second stage. Which variable(s) consistently have the smallest coefficients in the threshold regressions? If we can establish that they are unimportant, they can be left out of the second stage.

All the exogenous variables explaining endogenous variables should be in the first-stage regression. In the second stage, for example, having dropped the unimportant variables from the threshold equation, we will no longer have perfect collinearity even though interest rate is an exact function of every exogenous variable in the system.

Estimation of reduced-form equations gives predicted values for the eight[47] endogenous variables. For example:

The reduced form equation for the covenant threshold for loan *i* can be written out as:

$$CT_i = \gamma_0 + \gamma_1 FV_i + \gamma_2 \sigma_{CF,i} + \gamma_3 \sigma_{A,i} + \gamma_4 AQ_i + \gamma_5 Corr(FV_i, A_i) \times AQ_i + \gamma_6 \mathrm{FS}_i + \gamma_7 \mathrm{LA}_i + \gamma_8 OC_i + \gamma_9 G_i + \gamma_{10} LE_i + \gamma_{11} D_{REC,i}$$

$$+ \sum_j D_{SICj,i} \times \left(\gamma_{0j} + \gamma_{1j} FV_i + \gamma_{2j} \sigma_{CF,i} + \gamma_{3j} \sigma_{A,i} + \gamma_{4j} AQ_i + \gamma_{5j} Corr(FV_i, A_i) \times AQ_i + \gamma_{6j} \mathrm{FS}_i + \gamma_{7j} \mathrm{LA}_i + \gamma_{8j} OC_i + \gamma_{9j} G_i + \gamma_{10j} LE_i + \gamma_{11j} D_{REC,i}\right)$$

The summation is over the SIC codes (less 1 omitted industry to avoid perfect collinearity with the intercept term), each code indicated by a subscript *j*.

For the omitted industry, $D_{SICj,i} = 0$ for all the included dummies. The equation becomes:

$$CT_i = \gamma_0 + \gamma_1 FV_i + \gamma_2 \sigma_{CF,i} + \gamma_3 \sigma_{A,i} + \gamma_4 AQ_i + \gamma_5 Corr(FV_i, A_i) \times AQ_i + \gamma_6 \mathrm{FS}_i + \gamma_7 \mathrm{LA}_i + \gamma_8 OC_i + \gamma_9 G_i + \gamma_{10} LE_i + \gamma_{11} D_{REC,i}$$

and all the estimated coefficients apply to that omitted industry.

For every other industry, $D_{SICj,i} = 0$ for all included dummies except one. Let's call that one industry $j = 1$. Hence $D_{SIC1,i} = 1$ and the equation becomes:

[47] 6 covenant threshold variables, Interest Rates, Number of Covenants.

$$CT_i = \gamma_0 + \gamma_1 FV_i + \gamma_2 \sigma_{CF,i} + \gamma_3 \sigma_{A,i} + \gamma_4 AQ_i + \gamma_5 Corr(FV_i, A_i) \times AQ_i + \gamma_6 \mathrm{FS}_i + \gamma_7 \mathrm{LA}_i + \gamma_8 OC_i + \gamma_9 G_i + \gamma_{10} LE_i + \gamma_{11} D_{REC,i}$$

$$+1 \times (\gamma_{0,1} + \gamma_{1,1} FV_i + \gamma_{2,1} \sigma_{CF,i} + \gamma_{3,1} \sigma_{A,i} + \gamma_{4,1} AQ_i + \gamma_{5,1} Corr(FV_i, A_i) \times AQ_i + \gamma_{6,1} \mathrm{FS}_i + \gamma_{7,1} \mathrm{LA}_i + \gamma_{8,1} OC_i + \gamma_{9,1} G_i + \gamma_{10,1} LE_i + \gamma_{11,1} D_{REC,i})$$

This can be re-arranged as:

$$CT_i = (\gamma_0 + \gamma_{0,1}) + (\gamma_1 + \gamma_{1,1}) FV_i + (\gamma_2 + \gamma_{2,1}) \sigma_{CF,i} + (\gamma_3 + \gamma_{3,1}) \sigma_{A,i} + (\gamma_4 + \gamma_{4,1}) AQ_i + (\gamma_5 + \gamma_{5,1}) Corr(FV_i, A_i) \times AQ_i + (\gamma_6 + \gamma_{6,1}) \mathrm{FS}_i + (\gamma_7 + \gamma_{7,1}) \mathrm{LA}_i + (\gamma_8 + \gamma_{8,1}) OC_i + (\gamma_9 + \gamma_{9,1}) G_i + (\gamma_{10} + \gamma_{10,1}) LE_i + (\gamma_{11} + \gamma_{11,1}) D_{REC,i}$$

The sum of coefficients in each bracket gives the relevant coefficient for industry 1. Hence the second term in each sum gives the difference between coefficients for industry 1 and the omitted industry. To take an illustrative example, testing the significance of $\gamma_{0,1}$ is equivalent to testing whether the intercept for industry 1 is *different* to the intercept for the omitted industry, γ_0.

The reduced form equations for the other endogenous variables have the same construction.

For the second stage, right hand side endogenous variables are replaced by predictions from the first stage, in the form:

$D_i \times \widehat{CT_i}, \hat{I}, \hat{N}$

This allows fully pooled data, so that number of covenants, N, can appear as a regressor. The alternative of restricting each regression to loans with identical sets of covenants will make 'number of covenants' a fixed value. The effect on the structural equation of using the covenant threshold dummies is to 'switch off' irrelevant covenant thresholds that do not appear in the loan instrument, rather than have the problem of missing values.

6 structural equations for covenant threshold will look like this:

$$D_j \times CT_j = \beta_0 + \sum_{i=1}^{5} \beta_i \left(D_i \times \widehat{CT_i}\right) + \beta_6 \hat{I} + \beta_7 \hat{N} + \left(\beta_8 FV + \cdots + \beta_{18} D_{REC} + \beta_{19} D_{SICj}..\right) + \varepsilon$$

The remaining 2 structural equations are:

For Interest Rates,

$$I = \beta_0 + \sum_{i=1}^{6} \beta_i \left(D_i \times \widehat{CT_i}\right) + \beta_7 \hat{N} + \left(\beta_8 FV + \cdots + \beta_{18} D_{REC} + \beta_{19} D_{SICj}..\right) + \varepsilon$$

And for Number of Covenants,

$$N = \beta_0 + \sum_{i=1}^{6} \beta_i \left(D_i \times \widehat{CT_i}\right) + \beta_7 \hat{I} + \left(\beta_8 FV + \cdots + \beta_{18} D_{REC} + \beta_{19} D_{SICj}..\right) + \varepsilon$$

The variables in brackets on the right-hand side will be a subset of those used in the reduced-form equations, in order to satisfy the order and rank conditions. The observations to be used in the regression are those loans with covenant variable *j* present.

3.2.13 Research Hypotheses Equations

- Covenant Threshold (CT) Structural Equations
    - Hypothesis 1: β coefficient for AQ < 0 (>0) for min-type (max-type) covenants
    - Hypothesis 2: β coefficient for $Corr(FV, A) \times AQ$ < 0 (>0) for min-type (max-type) covenants
    - Hypothesis 3: Absolute value of β coefficient for AQ and/or $Corr(FV, A) \times AQ$ smallest for interest coverage ratio threshold

- Hypothesis 4: In balance sheet (income statement) covenant threshold equations, β coefficients for right hand side income statement (balance sheet) CT thresholds < 0
- Hypothesis 5: β coefficient for I < 0 (> 0) for min-type (max-type) covenants
    - Additional hypotheses:
    - β coefficient for FV greater than 0 but less than 1
    - β coefficients for σ_{CF} & σ_A > 0 (< 0) for min-type (max-type) covenants

- Interest Rate (I) Structural Equation
    - Hypothesis 6: β coefficient for AQ < 0
    - Hypothesis 7: β coefficient for N < 0
    - Hypothesis 8: β coefficients for some industry dummies $\neq 0$

- Covenant Number (N) Structural Equation
    - Hypothesis 9: β coefficient for AQ < 0
    - Hypothesis 10: β coefficient for I < 0
    - Hypothesis 11: β coefficient for $Corr(FV, A) \times AQ$ < 0 (> 0) for min-type (max-type) covenants
    - Hypothesis 12: β coefficient of CT < 0 (> 0) for min-type (max-type) covenants

3.2.14 Graphical Distribution of Covenants Across the Sample

Presented below are visual representations of the research sample. Figure 3.1 shows the distribution of the six different covenants, with the Interest Coverage Ratio covenant having the most observations at 567 (40% of the total sample), and Quick Ratio financial covenants having the fewest observations at 39 (3% of the sample).

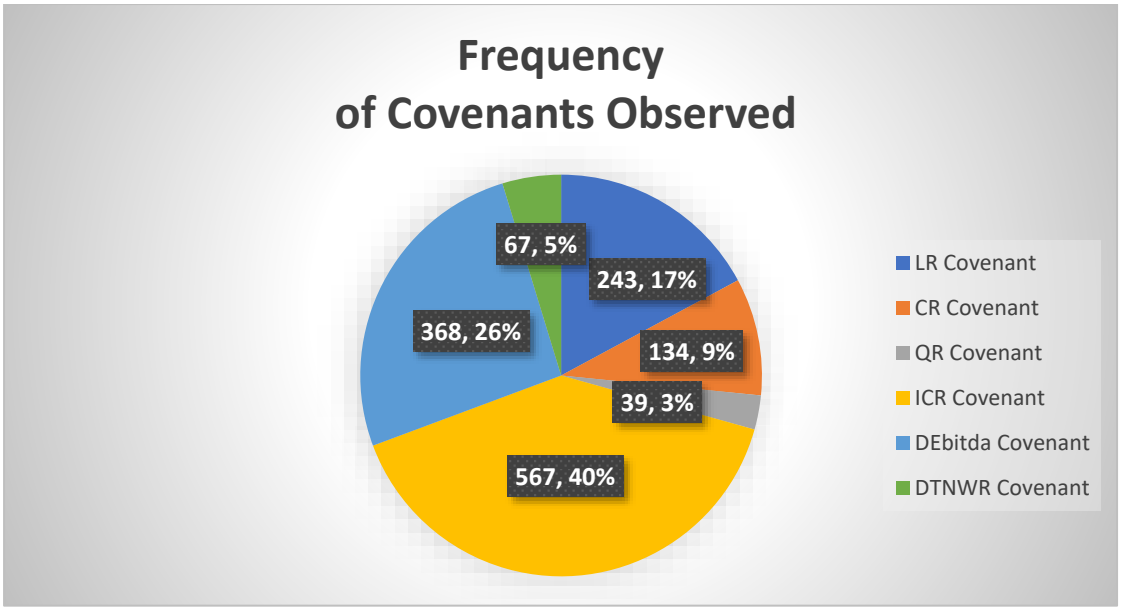


Figure 3.1

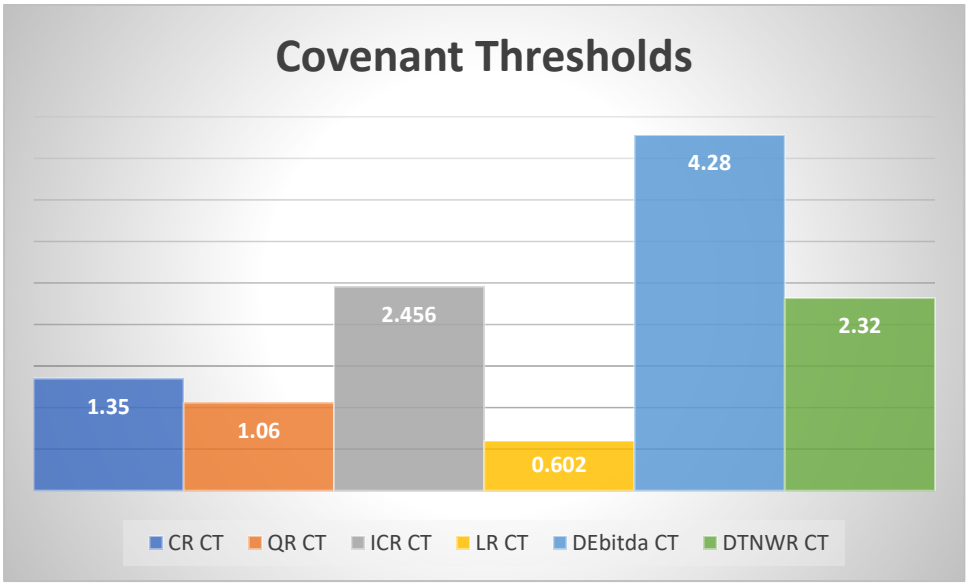


Figure 3.2

Figure 3.2 shows the average covenant threshold that is set by lenders for each financial variable. Pertinent to mention here that the Current Ratio, Quick Ratio and Interest Coverage Ratio covenants are set in the minima, and Leverage Ratio, Debt to EBITDA Ratio and Debt to Tangible Net Worth Ratio covenants are set in the maxima.

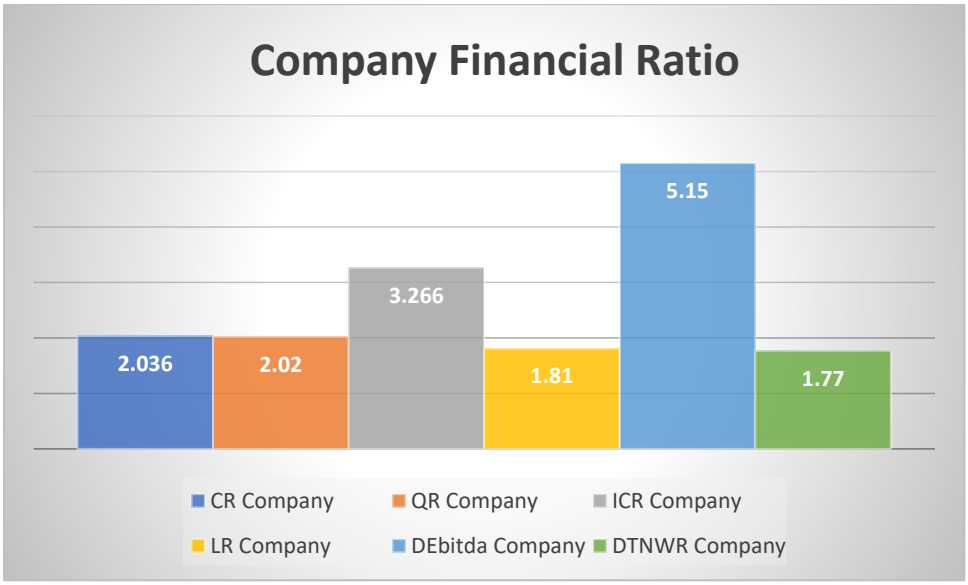


Figure 3.3

Figure 3.3 presents the actual financial variable of the company at the time of loan inception. This is the variable that is incorporated into the Covenant Slack calculations.

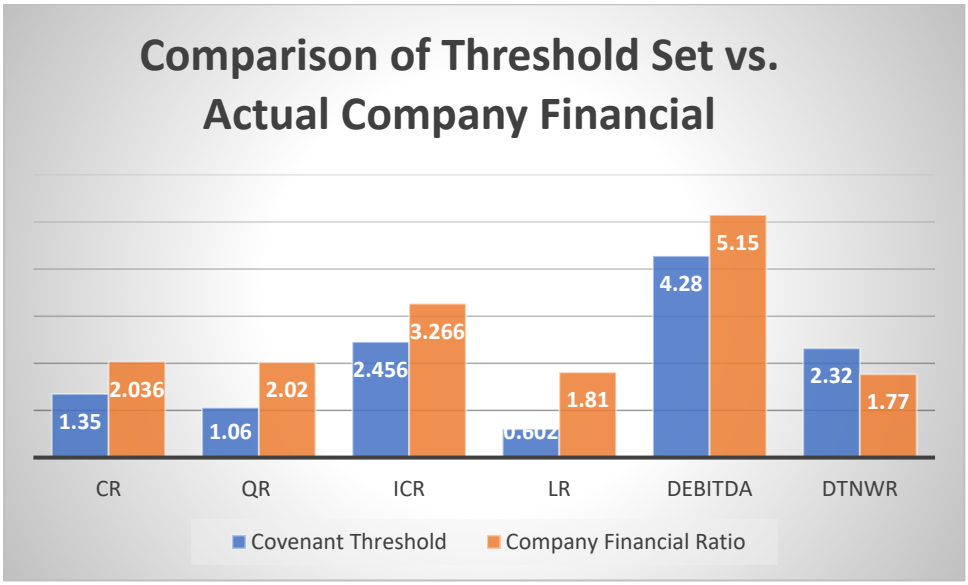


Figure 3.4

Figure 3.4 shows a side-by-side comparison of the Covenant Threshold set by the lenders, and the actual value of the financial variable at the time of loan inception. For example, for Current Ratio, the average *minimum* Current Ratio that needs to be maintained by borrowers in our sample, is 1.35, while the average actual value of the financial variable is 2.036, meaning the borrowers are in a comfortable position overall, having received favourable Current Ratio covenants on average.

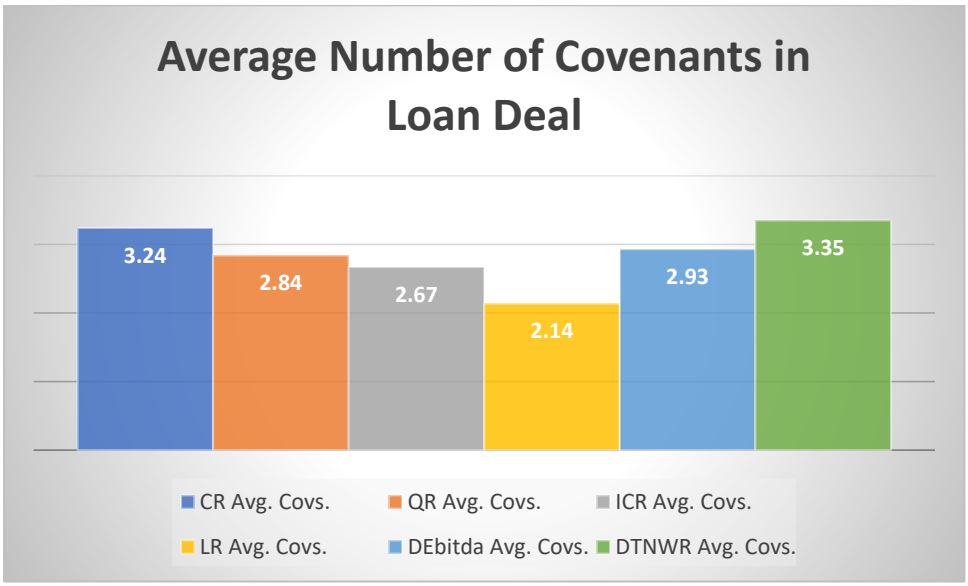


Figure 3.5

Figure 3.5 deals with the presence of multiple loans in a financial instrument provided by lenders. For example, for the primary covenant being Current Ratio covenant, there are on average 3 extra accompanying financial covenants written into the agreement.

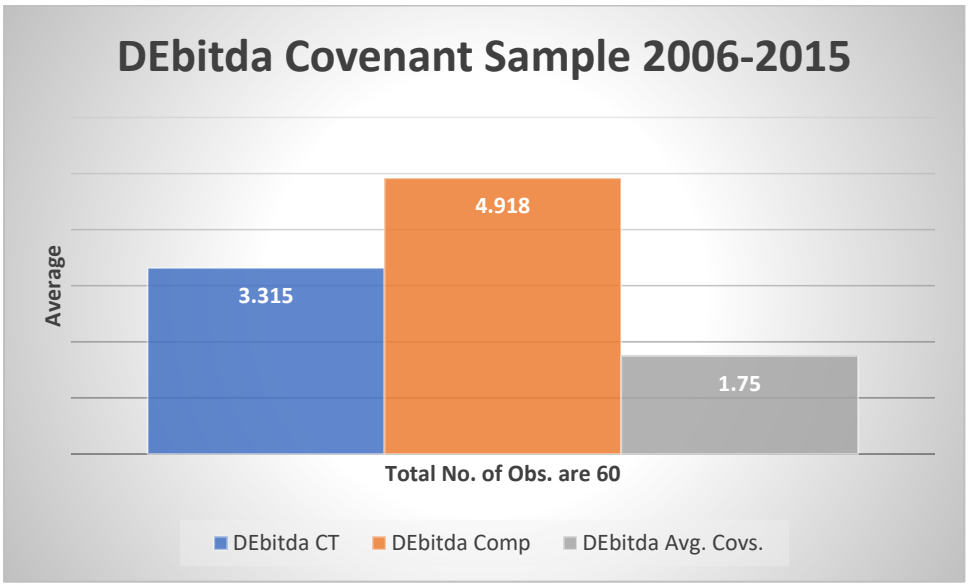


Figure 3.6

Figure 3.6 represents the Debt to EBITDA covenant sample from 2006-2015. The average Covenant Threshold for the sample is 3.315, with the actual value of the ratio being 4.918. It is observed that there are nearly 2 extra financial covenants per loan agreement.

4 Discussion of Results

This section covers the testing of chosen financial covenants in light of the literature discussed, and hypotheses developed. It is expected that the Covenant Slack measure will underperform the proposed Covenant Threshold measure of this research. Also, where significant, it is expected that Accrual Quality will provide incremental explanatory power over the Magnitude of Accruals.

4.1 Covenant Slack as a Dependent Variable

This research finds Covenant Slack to be an extremely poor measure while evaluating the hypotheses. While analysing the Interest Coverage Ratio covenant, the results are statistically weak, and the Two Stage Least Squares (2SLS) regressions are insignificant. Testing the Leverage Ratio covenant, the results are biased, and the estimated standard errors are incorrect, leading to heteroskedasticity. The Debt to Tangible Net Worth ratio covenant faces a similar issue of heteroskedasticity. For Quick Ratio and Debt to EBITDA Ratio covenant analysis, the 2SLS regressions are insignificant, and the Current Ratio covenant suffers from non-constant standard errors as well.

For brevity, the Covenant Slack analyses are not reported. Discussions from the earlier review, and research design sections lent credence to the possibility of such results. This leads to the testing of the proposed Covenant Threshold measure.

4.2 Covenant Threshold as a Dependent Variable

The Covenant Threshold measure outperforms the Covenant Slack measure. So much so, that 77[48] out of the total 84 Stage 1 and Stage 2 regressions for evaluating a specific financial variable's covenant threshold, are statistically significant. *None* of the regressions show heteroskedasticity. The full set of results, keeping in view the hypotheses, follow.

4.2.1 Leverage Ratio Financial Covenant

The leverage ratio covenant is set in the *maxima*. This means that lenders set a limit of maximum leverage that a borrower can attain, beyond which the covenant is breached, and a technical default occurs.

[48] All 7 instances of covenant threshold regressions being insignificant, occur in the post 2005 time period sample. Reasons for those, are discussed later in the chapter.

4.2.1.1 Leverage Ratio Financial Covenant – Jones Model

Looking at Table 4.2.1.1a from the sample size of 243 loan instruments, the average leverage ratio covenant threshold (CovThres) set by lenders is at 60.2%. The lowest covenant threshold is 35%, and the largest is at 95%, with three fourths of the sample getting a *maximum* leverage ratio covenant of 65% or lower. The LRComp variable defines the financial variable corresponding to the leverage ratio of the company. With a negative minimum value[49] in the sample, and a maximum value of 723%. There are 75% of borrowers that have a leverage ratio of 242% or lower, which means there are instances where at the time of the loan agreement, borrowers are in *technical default*[50]. ϭCFO and ϭTA represent the volatility of cash flows and total accruals, respectively. AQJones is the measure of Accrual Quality (AQ) from the Jones Model. It is seen that 75% of the sample's AQ as measured by the Adjusted R Squared, is at or below 43%, with 25% of the sample firm borrowers above that level. LRAAQ is the interaction variable for Leverage Ratio, Accruals Levels, and Accrual Quality. The LAmount variable represents the loan amounts obtained by a borrower, showing a large standard deviation. This is to be expected, as borrowers acquire firm for a variety of reasons such as everyday operations and working capital adjustments, to mergers and acquisition activities. The Operating Cycle (OpCycle) has a mean of 125 days for borrower firms, with a minimum of a day, and a maximum of 3090 days. Both of these values are unique, as the mean suggests, with the next lowest number being 8 days, and the next highest number being 365 days. FirmSize represents the size of the borrowing firm, and it measured by taking the log of the total assets. The firm Leverage related to debt and assets, shows a mean of 59% with 75% of the borrowers having a leverage of 69% or lower. Growth prospects of the borrowers have a mean of 2.2, with 25% of the borrowers being at or below the 1.2 mark. A total of 39 companies are below the mark of 1, suggesting undervaluation of their stocks. The minimum value of -4.75 is the only negative borrower in the sample, while the maximum of 29.5 is the sole borrower above 8. A total of 6 firms obtained loans during a period of Recession. Lenders charge an additional 1.96% interest over the base interest rate on average, represented by the variable Interest. The maximum number of covenants in the Leverage Ratio covenant sample is 6 covenants woven into a single loan instrument, with the average number of covenants in loans being 2.

[49] There is only one negative value in the Leverage Ratio Covenant sample. It is not excluded.
[50] Unlike Demerjian and Owens (2014), these are not excluded.

For the Leverage Ratio financial covenant sample, there is one secondary financial covenant in the loan deals that is also evaluated. That is the Interest Coverage Ratio financial covenant. Secondary covenants here are the ones that are also present in the loan deal, besides the primary covenant being analysed.

Table 4.2.1.1b shows the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality. FirmSize and Leverage are normally distributed, with the rest of the variables not displaying a normal distribution. Since our tests do not assume normality, no changes are made to the sample data.

To remove the issue of endogeneity among variables of interest to this research and evaluate the results, the 2SLS outputs and their discussions follow.

Stage 1 results help us identify which variables are of significance to Stage 2 regressions. Pertinent to mention here that only statistical significance of an exogenous variable does not justify its importance to Stage 2 regressions. Low beta coefficient values, the variable's relevance to the covenant under consideration, and hypothesized relationships between variables all form a collective basis for inclusion and exclusion.

Table 4.2.1.1c shows results of the dependent Leverage Ratio covenant threshold (CovThres) and all the independent exogenous variables. The regression is significant at the 1% level, with a high Adjusted R Squared of 38.4%. Testing for heteroskedasticity through the Breusch-Pagan test results in our data being homoscedastic. OpCycle, FirmSize and the SIC4 variables are significantly positively related to CovThres in Stage 1, but with low beta values.

Table 4.2.1.1d shows results of the dependent variable Interest and all exogenous independent variables. The regression is insignificant, with a low Adjust R Squared of 0.03%. As the anova results are insignificant, most of the independent variables are insignificant with the exception of FirmSize, which is significant at the 5% level.

Table 4.2.1.1e portrays analyses from the dependent variable CovNum and the independent variables. The Adjusted R Squared is 34.9% with the regression being significant at the 1% level. The leverage ratio of the borrower (LRComp), FirmSize, SIC4 and SIC5 are significant independent variables at the 1% level.

Table 4.2.1.1f provides results from the Interest Coverage Ratio (ICR) covenant. An Adjusted R Squared of 37.5% is observed, with the regression being significant at the 1% level. Independent variables Leverage and Growth are significant at the 1% level.

Stage 2 of Two Stage Least Squares – Analyses of Results in Light of Hypotheses

Table 4.2.1.1g shows results from Stage 2 of the 2SLS Leverage Ratio covenant threshold analysis. The regression's Adjusted R Squared is 33.8%, which is significant at the 1% level with a p-value of 0.00%. The Breusch-Pagan test returns a p-value of 45%, which means our analyses are free of heteroskedasticity. Inthat (predicted value of Interest from Stage 1) is significant at the 1% level, with a negative relation between CovThres and Interest. This suggests that as the lenders increase interest rates, thresholds for leverage ratio covenant get tighter. This is not hypothesized, as the hypothesis predicted a positive relationship. On further inspection, the variable has a very low beta coefficient, which means the result is weak. Though the correct way of interpreting the result, and other such non-hypothesized signed results, is that a non-hypothesized sign between variables suggests *insignificance*, as the hypothesis is one-tailed and signed. If the hypothesis was two-tailed with no prediction of signs, then by definition, the variables cannot have a wrong sign. CovNumhat (predicted value for Number of Covenants from Stage 1) is significant at the 1% level and has the hypothesized positive relationship with leverage ratio covenant threshold. As the number of covenants in a loan instruments increase, lenders relax the covenant by increasing the maxima threshold. The beta coefficient value is nearly 11 times higher than that of Inthat. AQJones is significant at the 1% level, with a hypothesized positive relation to CovThres. As the quality of accruals increases, lenders relax the leverage ratio covenant for borrowers. The result proves that lenders take into account the quality of accruals of borrowers, while setting covenant thresholds. Variables SIC4 and SIC5, dummies for representing the 4K and 5K Standard Industrial Classification code companies, are significant at the 1% level. As the beta values on these dummies are 0, the analysis finds no evidence of the industrial component in financial covenant threshold determination.

Table 4.2.1.1h shows results from Stage 2 of 2SLS Interest variable analysis. The regression is insignificant, with an Adjusted R Squared of 1.7%. This suggests that the spread charged over the base interest rate charged by lenders, is not dependent on any of the model's independent variables.

Table 4.2.1.1i provides results for stage 2 of the CovNum dependent variable. The regression is significant at the 1% level, with an Adjusted R-Squared of 42.7%. It is seen that the leverage ratio of the borrower company (LRComp) is significant at the 1% level with a positive relationship to CovNum and a beta coefficient between 0 and 1, as hypothesized. As the level of leverage in a firm rises, that leads to extra monitoring of the firm's activities by the lenders. Here, that happens in the form of additional covenants. The threshold for maximum leverage (LRhat) set by lenders is positively related to CovNum at the 1% level as well. This lends credence to the endogeneity debate between covenant threshold and covenant numbers, as lenders relaxing the LRhat variable by increasing the maximum threshold for borrowers, leads to increased financial covenants in the loan instrument. Most importantly, accruals quality (AQJones) is significant at the 1% level with a healthy beta value coefficient that is negatively related to CovNum, as hypothesized. Increasing quality of accruals in a borrowing firm helps them secure better credit terms; in this case, lesser financial covenants. Pertinent to mention here that, increasing loan amounts obtained (LAmount) and operating cycles of borrower operations (OpCycle) lead to additional covenant numbers. These results are significant at the 1% level, albeit with low beta values. There is also no support to suggest industry characteristics play a role in CovNum determination, as both SIC4 and SIC5 have 0 beta values.

Table 4.2.1.1.j represents results from the minimum Interest Coverage Ratio (ICR) financial ratio covenant. It is significant at the 1% level, with an Adjusted R Squared of 24%. LRhat is negatively related to ICR, and it is significant at the 1% level. This means that relaxing of the threshold set on the Leverage Ratio covenant (an increase), leads to a lowering of the *minimum* ICR threshold (a decrease). The result lends support to the notion that covenants in loan instruments act as complements and/or substitutes to each other; in this case, complements. CovNumhat (predicted value of CovNum from Stage 1 regressions) is significant at the 1% level, with a beta value of -1.324 suggesting the hypothesized negative relationship. As the number of covenants in a loan deal increase, we see a corresponding decline (relaxation) in the ICR covenant threshold. The results also provide evidence that increasing leverage in a borrower firm leads to a higher ICR requirement, as the LRComp variable is significantly positively related to ICR at the 1% level.

4.2.1.2 Leverage Ratio Financial Covenant – Modified Jones Model

The descriptives from the Modified Jones sample for Leverage Ratio covenant remain the same as Table 4.2.1.1a, for the exception of the accruals quality variable, i.e. AQModJones. Table 4.2.1.2a shows that there is a slight overall decline in measurement of accrual quality through the Modified Jones model compared to the Jones Model, with 75% of the borrowers at or below the 38% Adjusted R Squared measure. 25% of the borrowers show accruals quality higher than 38%, with an average accrual quality of 22% for the entire sample.

Table 4.2.1.2b shows the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality. FirmSize and Leverage are normally distributed, with the rest of the variables not displaying a normal distribution.

Stage 1 of Two Stage Least Squares

Table 4.2.1.2c displays results for the Leverage Ratio covenant threshold (CovThres) and exogenous variables. The regression is significant at the 1% level, with an Adjusted R Squared of 38.6%, and a Breusch-Pagan p-value of 47.80% suggesting homoscedasticity in the analyses. OpCycle, FirmSize, Leverage and SIC4 are also significant at the 1% level, with low beta coefficients.

Table 4.2.1.2d shows results from the Interest dependent variable. Like the results from the Jones Model for this variable, the regression is insignificant at the 1% and 5% levels, with a low Adjusted R Squared of 0.04%.

For the CovNum dependent variable in Stage 1, Table 4.2.1.2e gives significant results at the 1% level for the leverage ratio financial variable of the borrower (LRComp), and FirmSize. Industrial analysis shows that the dummies for SIC4 and SIC5 borrowers are significant at the 1% level, but as the beta values are low, the relationship is weak.

The last Stage 1 analysis in the Modified Jones model analysis for Leverage Ratio covenant, is ICR covenant as a dependent variable displayed in Table 4.2.1.2f. The regression is overall significant at the 1% p-value, with an Adjusted R Squared of 35.3%. Loan amount borrowed (LAmount) is significant here at the 5% level, with a beta coefficient of 0 suggesting the effect of the variable is negligible. Furthermore, Leverage of the borrower, and Growth prospects are also significant at the 1% level.

Stage 2 of Two Stage Least Squares – Analyses of Results in Light of Hypotheses

Table 4.2.1.2g displays results for the Leverage Ratio financial covenant threshold as a dependent variable. The results are marginally better than the ones obtained from the Jones Model, overall. The regression is significant at the 1% level, with an Adjusted R Squared of 34.4%. There is no heteroskedasticity in the analyses, as the Breusch-Pagan test's result returns a p-value of 45.3%. CovNum is significant at the 1% level, with a positive hypothesized relationship between number of covenants and leverage ratio covenant threshold, CovThres. Increasing the number of covenants in a loan deal leads to a lax threshold set by the lenders. Accrual Quality, measured by the AQModJones variable, is also significant at the 1% level with a predicted positive relationship to leverage threshold. Both the Jones Model analyses, and now the Modified Jones model analysis have supported the hypothesis that lenders consider the borrower firm's quality of accruals, before setting covenant thresholds. Although it can also be observed that the LAmount, SIC4 and SIC5 variables are significant at the 1% level, their corresponding beta coefficients are 0. Hence, they are negligible to the regression analysis, with no material effect on the dependent variable.

Table 4.2.1.2h provides data from the Interest dependent variable. Like the Jones Model analyses before it, the Modified Jones model analysis also provides insignificant results. This suggests that while setting the Leverage Ratio covenant threshold, lenders do not take the variable into account *directly*. With hypothesized results obtained from the CovThres and CovNum analyses, both of which are endogenous to Interest, this is not surprising.

Number of Covenants (CovNum) as a dependent variable, is analysed in Table 4.2.1.2i. The regression is highly significant at the 1% level, with an Adjusted R Squared of 43.1%. Like the Jones Model before it, the results show that Inthat (Interest) is positively related to CovNum at the 1% significance level. Increasing the number of covenants is seen to behave as a proxy for interest rates. Can it be that in situations where lenders do not take Interest into account directly, it is adjusted for by substituting it through increased financial covenants? The persistence of this result in other models, might lend support to this notion. LRhat (predicted value of LR threshold from Stage 1) is positively related to CovNum, with a p-value of 1% and a relatively high beta coefficient at 8.546. This suggests that increasing number of covenants lead to a lax setting of the leverage ratio threshold, consistent with the hypotheses. The leverage ratio of the borrower, LRComp, is positively related to CovNum, further lending credence to the Jones Model result that increasing of the borrower firm's respective financial variable will lead to increased lender monitoring in the form of added covenants. Accruals Quality (AQModJones) is again found to be significant at the 1% level, and a negative hypothesized relationship is

observed. Lenders impose fewer financial covenants on borrowers if their evaluations of the borrowers' accruals are good. LAmount, OpCycle, SIC4, and SIC5 are all variables that are significant at the 1% p-value level, but with extremely low beta coefficients.

Table 4.2.1.2j displays results from the ICR threshold dependent variable. The regression is significant at a p-value of 1%, with an Adjusted R Squared of 20.6%. LRhat is negatively related to ICR at the 1% level, with a loosening of the leverage ratio covenant threshold bringing about a relaxation in the ICR covenant threshold. The result further strengthens the findings from the Jones Model, that ICR threshold is a complement to the LR threshold. The CovNumhat variable is negatively related to ICR threshold, further proving that increased oversight from lenders in the form of extra covenants results in a loose setting of the ICR threshold. Furthermore, LRComp being significant at 1% and positively related to ICR threshold means that increasing leverage in borrowing firms makes lenders set higher interest coverage requirements.

4.2.1.3 Leverage Ratio Financial Covenant – The Peasnell Model

Table 4.2.1.3a shows descriptives from the Peasnell Model for the Leverage Ratio financial covenant. Changes are observed in the ϬWCA variable, which is the standard deviation of working capital accruals, and AQPeasnell variable, which represents accrual quality through the Peasnell Model. Larger working capital accruals are seen in the sample on average, compared to the total accruals measure from the Jones and Modified Jones models. The measure of quality of accruals (AQPeasnell) has also increased considerably, with 75% of the borrowing firms at or below the 53% Adjusted R Squared level of accrual quality. The average accrual quality through the Peasnell model is 27.7%[51] for the entire sample.

Table 4.2.1.3b shows the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality. FirmSize and Leverage are normally distributed, with the rest of the variables not displaying a normal distribution.

Stage 1 of Two Stage Least Squares

[51] Was 23.4% for the Jones Model, and 22% for the Modified Jones Model.

Table 4.2.1.3c displays data for the Leverage Ratio covenant threshold, and independent exogenous variables. The regression is significant at the 1% p-value level, with an Adjusted R Squared of 39.5%. The Breusch-Pagan test statistic is 45.1%, suggesting homoscedasticity.

ϭWCA is significant at the 1% level, and negatively related to CovThres. This means that an increase in the volatility of working capital accruals leads to a tighter setting of the leverage covenant threshold, in a stand-alone setting without the inclusion of Interest and CovNum endogenous variables. Although this is a hypothesized relationship that is observed in Stage 1, it remains to be seen whether a Stage 2 analysis, which is of primary interest to this research, returns similar results. Other significant variables at the 1% p-value levels are OpCycle, Leverage, and SIC4, with negligible beta coefficients.

Table 4.2.1.3d displays data from Interest as a dependent variable. Similar to both the Jones and Modified Jones model results, the Peasnell model returns an insignificant regression. None of the independent variables are significant at the 1% level, with only FirmSize negatively related to the spread of Interest rates at the 5% significance level.

Table 4.2.1.3e shows results from the CovNum dependent variable at Stage 1 of 2SLS. The regression is significant at the 1% level, with an Adjusted R Squared of 33.7%. LRComp is positively related to CovNum at the 5% p-value, and FirmSize is negatively related to CovNum at the 1% significance level. They are consistent with expected results but would be of interest in Stage 2 regression results to prove the hypotheses.

Stage 1 analysis of the ICR covenant threshold is presented in Table 4.2.1.3f. The regression is significant at the 1% level, with an Adjusted R Squared of 39.5%. LAmount is significant, but the variable carries a beta coefficient of 0. Growth prospects of borrowers also display a positive relationship, and the variable is significant at the 1% level.

Stage 2 of Two Stage Least Squares – Analyses of Results in Light of Hypotheses

The Peasnell model analysis is seen to support the hypotheses related to volatility of accrual levels.

Table 4.2.1.3g shows results for LR CovThres. The regression is significant at the 1% level, with an Adjusted R Squared of 38.6%. The data shows no heteroskedasticity, with a Breusch-Pagan test statistic of p-value 61.1%. CovNumhat is significant at the 1% level, positively related to CovThres. Increasing the number of covenants in the loan instrument leads to a less

strict threshold, as hypothesized. ϬWCA is significant at the 1% level, with a negative relationship to CovThres. This means that as the volatility of working capital accruals increases, it leads to tighter leverage ratio covenant threshold; this is predicted in the covenant threshold structural equation hypotheses. LRAAQ, which is the interaction variable for Leverage Ratio, Accrual Levels and Accrual Quality, is significant at the 1% level and positively related to CovThres as predicted in Hypothesis 2 of covenant threshold structural equations. This means that lenders evaluate the magnitude of accruals and its relevance to the financial ratio covenant, evaluate their quality, and use the combined measure as one of the tools in setting covenant thresholds for borrowers. Higher values lead to relaxed thresholds being set, as is observed here. LAmount, OpCycle, SIC4 and SIC5 are significant at the 1% level, but present immaterial beta values.

Table 4.2.1.3h displays results from the Interest variable regressions. Like previous models, it is insignificant at the 1% and 5% levels, with an Adjusted R Squared of 1.4%.

CovNum analysis from Stage 2 of 2SLS is presented in Table 4.2.1.3i. The regression is significant at the 1% level, with an Adjusted R Squared of 41.9%. LRhat represents the LR covenant threshold predicted values from Stage 1. It is significant at the 1% level and positively related to CovNum. When lenders increase the number of covenants in the loan instrument, a corresponding relaxation in the covenant threshold is predicted, and observed in this result. Due to the additional covenants, maximum leverage threshold attainable by borrowers would be set higher. In all three of the accrual models so far, it is seen that the Interest variable is insignificant at the Stage 1 and Stage 2 regressions, as a dependent variable. On the other hand, in all the model analyses, CovNum is observed to have a positive relation with Inthat (predicted value of Interest). The Peasnell results further suggest that in situations where Interest is directly not taken into account by lenders, it is compensated for by indirect evaluation in the form of increased CovNum variable. This result is persistent so far and goes against the established notion of covenant numbers and interest rates being endogenous, but negatively related only. It remains to be seen whether the relation persists through the remaining three accrual models, as well as whether it is specific to the Leverage Ratio covenant evaluation or presents itself in the other covenants too. LRComp is significant at the 1% level, and positively related to CovNum. Again, a persistent result so far suggesting that increasing financial variable, borrower leverage in this case, results in more covenants being added to loan deals. CovNum and ϬWCA are significantly positively related at the 1% level, which means that accrual volatility is also part of the tools that lenders use to evaluate borrower financial health.

If the working capital accruals are increasingly volatile, lenders will secure their position by adding extra financial covenants to the loan agreements. LRAAQ is also significant at the 1% level with a predicted negative relation to CovNum. As lender's evaluation of the interaction variable goes up, borrowers get reduced financial covenants in their loan instruments.

Table 4.2.1.3j shows results from the ICR financial covenant. Consistent with the Jones and Modified Jones models' results, LRhat is significantly negatively related to ICR covenant, providing support to the notion of both covenants being complementary to each other. Increased lender monitoring in the form of additional covenants lowers the minimum ICR covenant requirements, which is evidenced from a negative relationship between CovNum and ICR. Furthermore, increase in the leverage financial variable LRComp makes lenders set tighter ICR thresholds, because taking on more debt would require borrowers to have higher debt servicing capabilities. For lenders to safeguard their positions, higher ICR thresholds ensure that they can intervene if borrowers potentially run into difficulties with their interest payments.

4.2.1.4 Leverage Ratio Financial Covenant – Dechow and Dichev (DD) Model

Like the Peasnell model's descriptives, there are two variables whose values change. The volatility of accruals from working capital, and the measure of the quality of accruals. Table 4.2.1.4a shows the descriptives for the DD model. On average, the volatility of ϬWC is lower for the DD measure, compared to the Peasnell model but higher than ϬTA volatility from Jones and Modified Jones models. The mean for AQDD (Accrual Quality measure from DD model) is 25.8%, which is lower than the Peasnell model but higher than Jones and Modified Jones models. 75% of the sample has an accrual quality of, or below 52.6%.

Table 4.2.1.4b shows the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality. FirmSize and Leverage are normally distributed, with the rest of the variables not displaying a normal distribution.

Stage 1 of Two Stage Least Squares

Table 4.2.1.4c displays results from the CovThres variable. The regression is significant at the 1% p-value, with and Adjusted R Squared of 37.1%. The Breusch-Pagan test statistic p-value is 36.6%, meaning the variance of residuals is equal and homoscedastic. OpCycle and SIC4 are statistically significant at the 1% level, but with low beta coefficients their effects on the analysis are negligible.

Table 4.2.1.4d shows the continuity of the Interest variable being insignificant across all models, for Leverage Ratio financial covenant. FirmSize is negatively related to Interest at the 5% significance level.

CovNum Stage 1 regression is displayed in Table 4.2.1.4e. LRComp is significantly positively related to CovNum at the 5% p-value level. Higher debt financing from borrowers will make lenders increase their monitoring of the borrowing firm's activities. FirmSize is negatively related to CovNum at the 1% level, suggesting that increasingly bigger companies tend to get fewer covenants from lenders in their loan deals. This is consistent with the literature, but as this is a Stage 1 result, a meaningful deduction can only be made once these results are observed in Stage 2 regressions. SIC4 and SIC5 dummies are also significant at the 1% level but are weak with 0 beta coefficient values.

ICR Stage 1 regression is significant at the 1% level, with an Adjusted R Squared of 39.5%. Table 4.2.1.4f shows that LAmount is significant, but with a beta coefficient of 0. The Growth variable is positively related to ICR at the 1% level.

Stage 2 of Two Stage Least Squares – Analyses of Results in Light of Hypotheses

Table 4.2.1.4g shows results for the CovThres regression being significant at the 1% p-value, with an Adjusted R Squared of 35.8%, and homoscedastic error terms. CovThres is positively related to CovNumhat at the 1% level, which is consistent with the previous results. LRAAQ, which is the interaction variable, is significant at the 1% level and has the predicted positive sign to CovThres.

Table 4.2.1.4h has results for Interest variable that have been consistently insignificant so far. Again, this suggests that for the Leverage Ratio financial covenant, there is no *direct* focus on the amount of interest charged on these loans, from lenders.

CovNum analysis as a dependent variable are presented in Table 4.2.1.4i. LRhat shows a highly significant, positive relationship to CovNum at the 1% level. The persistence of this result across the models means that lenders relax maxima covenant thresholds when they add extra financial covenants to a loan deal. Or, tighter maxima financial covenant thresholds lead to fewer covenants imposed by lenders. Inthat is positively related to CovNum, suggesting that an increase in the number of covenants acts as a substitute for interest rates in the Leverage Ratio financial covenant analysis. LRComp is significantly positively related to CovNum, further supporting the results that lenders control for risky, debt-heavy borrowers through the imposition of additional financial covenants. Furthermore, LRAAQ is found to be significant at the 5% p-value level, with the hypothesized negative value.

ICR threshold as a dependent variable in Stage 2, is tabulated in Table 4.2.1.4j. The regression is significant at the 1% level, with an Adjusted R Squared of 23.2%. LRhat is negatively linked to ICR threshold, which means that increasing the maxima threshold on the leverage ratio covenant threshold *lowers* the minima threshold on the interest coverage ratio threshold, hence acting as complements to each other in the loan instruments. CovNumhat also has the hypothesized negative relationship to ICR threshold, with increasing the number of covenants leading to a relaxing (lowering) of the ICR threshold. LRComp is seen to portray the hypothesized positive relation as well, with an increase in the indebtedness of borrowers requiring higher interest coverage ratios by lenders.

4.2.1.5 Leverage Ratio Financial Covenant – The McNichols Model

There is only one change in the descriptives of the McNichols Model, and that is brought about by a change in the measure of the accrual quality metric (AQMcNichols). Table 4.2.1.5a shows that the average accrual quality for the sample is 48.1%. This is considerably higher than the mean measured through all the previous models. 75% of the sample borrowers have an accrual quality of 84% or below it, which is again the highest so far.

Table 4.2.1.5b shows consistency with previous distribution results, and only the FirmSize and Leverage variables are normally distributed. As discussed earlier, since our analyses do not assume data to be normally distributed, the rest of the variables not following a normal distribution is not a problem.

Stage 1 of Two Stage Least Squares

Table 4.2.1.5c shows Stage 1 results for CovThres. The regression is significant at the 1% level, with and Adjusted R Squared of 37% and homoscedastic error terms. OpCycle and SIC4 variables are found to be significantly related to CovThres, but with low beta coefficients have no material effect.

Table 4.2.1.5d shows insignificant Interest variable results for Stage 1, with FirmSize significant at the 5% level. The regression is overall carrying an Adjusted R Squared of .04%, with a p-value of 38%.

CovNum Stage 1 regression is tabulated in Table 4.2.1.5e. Adjusted R Squared is 33.7%, with a regression p-value significant at 1%. LRComp is significantly positively related, and FirmSize is negatively related to CovNum.

ICR Stage 1 regression is presented in Table 4.2.1.5f. Consistent with previous results, the regression is significant at the 1% level, with an Adjusted R Squared of 37.3%. Growth is seen to be positively related to ICR, meaning lenders are sceptical of the valuation of the company's assets, and are setting tighter ICR thresholds. A duplication of this result in Stage 2 analyses would support the notion.

Stage 2 of Two Stage Least Squares – Analyses of Results in Light of Hypotheses

The McNichols model's results are better than DD model's and below par compared to Jones, Modified Jones and Peasnell model's results.

CovThres variable's regression analysis is presented in Table 4.2.1.5g. It shows an Adjusted R Squared of 33.2%, regression significance at the 1% p-value level, and homoscedastic error terms with a Breusch-Pagan test statistic of 5.8%. Consistent with previous results, CovNumhat is positively related to CovThres. Like the DD model's AQ measure, no significant relationship is observed between the McNichols AQ measure (AQMcNichols) and CovThres, but there is a significant negative relationship between volatility of working capital accruals σWC and CovThres, at the 5% level. This relationship is hypothesized in the CovThres structural equations. As the volatility of working capital accruals increase, lenders move to set tighter leverage ratio covenant thresholds. This suggests that lenders are evaluating the fluctuations in

the magnitude of accruals. Furthermore, the interaction variable LRAAQ is significant at the 1% level, with a hypothesized positive sign on the beta coefficient, which means that the volatility as well as the quality of accruals are taken into account by lenders.

Interest variable's Stage 2 regression analysis is insignificant and provides no meaningful data. The result is consistent with previous models, as shown in Table 4.2.1.5h.

Table 4.2.1.5i presents data from the Stage 2 CovNum dependent variable regression. Consistent with previous hypothesized results and discussion, LRhat, Inthat, and LRComp variables are significantly positively related to CovNum, at the 1% p-value level. The evaluation ϬWC is also significantly positively related to CovNum, showing that increasing volatility of accruals makes lenders increase the number of financial covenants. While the analyses for DD and McNichols models show that lenders consider the volatility of accruals as hypothesized, no relationship is observed between the AQ metric and the CovThres or CovNum dependent variables.

ICR as a dependent, covenant threshold variable is shown in Table 4.2.1.5j. The regression is significant at the 1% level, with an Adjusted R Squared of 21.7%. Consistent with hypothesized results from the prior models, LRhat and CovNum variables are significantly negatively related to ICR threshold, and LRcomp shows a significant positive relationship.

4.2.1.6 Leverage Ratio Financial Covenant – The Francis Model

The two changes to the descriptives from the Francis Model are volatility of accruals measured by the variable ϬTCA, and accrual quality, measured by AQFrancis. The average quality of accruals through the Francis Model is 38.3%, with 75% of the sample borrowers at or below the 74% accrual quality level. Table 4.2.1.6a presents the values.

Table 4.2.1.6b shows the tests for normality of the sample data, and consistent with all prior results, FirmSize and Leverage are normally distributed, with the rest of the variables displaying a non-normal distribution.

Stage 1 of Two Stage Least Squares

Results for the CovThres Leverage Ratio financial covenant, as a dependent variable in Stage 1, are shown in Table 4.2.1.6c. Adjusted R Squared is 39.3%, with a regression significance at the 1% level, and homoscedasticity confirmed by the Breush-Pagan test p-value of 16.6%.

The standard deviation of accruals, as measured by ϬTCA is found to be significant at the 1% level, and negatively related to Stage 1 CovThres variable. OpCycle, SIC4, and SIC5 are significant at the 1% levels, but immaterial due to the beta coefficients being 0.

Table 4.2.1.6d shows results for the Interest variable in Stage 1, and as has been seen throughout the LR covenant analysis, it is insignificant.

CovNum variable's evaluation is shown in Table 4.2.1.6e, for Stage 1. Adjusted R Squared is 33.4%, with a regression significance at the 1% level. LRComp is positively related, and FirmSize is negatively related to the dependent variable.

Table 4.2.1.6e displays results for the ICR financial covenant, in Stage 1. The regression is significant at the 1% level, with an Adjusted R Squared of 41.2%. The loan amount borrowed by firms (LAmount) is significant at the 1% level, but with a negligible beta coefficient. Growth is positively related to ICR, as seen consistently throughout the LR analysis.

Stage 2 of Two Stage Least Squares – Analyses of Results in Light of Hypotheses

Like the McNichols and Peasnell models, besides confirming the consistent hypothesized results, the Francis model supports the volatility of accruals hypothesis for a maxima covenant threshold.

Table 4.2.1.6f shows results for the CovThres Leverage Ratio financial covenant in Stage 2. The regression is significant at the 1% level, with an Adjusted R Squared of 35.8%, and homoscedastic error terms with a Breusch-Pagan test statistic of 44.4%.

CovThres is positively related to CovNumhat at the 1% level, suggesting that increasing covenant number will lead to a corresponding increase in the maximum leverage ratio threshold set by lenders, as hypothesized. Similarly, consistent with Peasnell and McNichols model's findings, volatility of accruals ϬTCA is negatively related to CovThres as hypothesized. As the standard deviation of accruals goes up, lenders impose stricter leverage ratio covenant threshold on the borrowers. LRAAQ is significant at the 1% level, with a predicted positive

sign on the beta coefficient. LAmount, SIC4 and SIC5 variables are significant with negligible beta values.

Interest variable analysis is carried out and presented in Table 4.2.1.6g. The regression is insignificant.

Table 4.2.1.6h displays results from the CovNum dependent variable analysis. The regression is significant at the 1% level, with an Adjusted R Squared of 35.2%. Consistent with previous findings LRComp, and Interest are significantly positively related to CovNum at the 1% level. ϬTCA is also positively related to CovNum at the 5% significance level, as hypothesized. This means that increasing accrual volatility leads to increased oversight by lenders.

ICR covenant threshold results are shown in Table 4.2.1.6i. Significant at the 1% level, and with an Adjusted R Squared of 35.2%, we see that LRhat is negatively related to ICR threshold. Suggesting that both financial covenants act as complements to each other. For the first time across all the models' analyses, a predicted positive relationship is observed between the volatility of cash flows from operations measured through the ϬCFO variable, and ICR threshold. With a high beta coefficient, the hypothesis that inconsistent borrower cash flows will result in stricter financial covenant thresholds set by lenders, is proven.

4.2.1.7 Leverage Ratio Covenant – Summary

The leverage ratio financial covenant is set by lenders in the maxima, which means borrowers need to remain below a specified and mutually agreed upon maxima leverage ratio threshold, before entering technical default. An analysis of the leverage ratio covenant, considering the accrual models and Two Stage Least Squares method is carried out, with the Peasnell model outperforming the other models. The results support the following predictions and hypotheses:

Summary of the Main Findings
• Covenant Threshold is a superior measure to Covenant Slack.
• Covenant Threshold is determined by lenders after evaluating the Accrual Quality of borrowers.
• Covenant Threshold is determined after lenders consider the financial variable to be written as a covenant into the loan instrument, its supposed effect on the magnitude of accruals, and the quality of accruals. The interaction variable LRAAQ is significant in 4 out of 6 equations for threshold.

• Interest has no direct bearing on the Leverage Ratio financial covenant threshold. But this research observes that lenders are compensating for that through increased number of covenants.
• Lenders consider the standard deviation of accrual levels, while setting threshold levels in a loan deal. Also, for the Francis Model, it is observed that the volatility of CFOs are taken into consideration.
• Financial Variable of borrowers at loan inception, the Interaction Variable, and the Accrual Quality are all determinants of the number of covenants in a loan deal.
• Multiple covenants in a loan deal may act as complements and/or substitutes.

4.2.2. Current Ratio Financial Covenant

For brevity, some reporting changes will be made after a full display of results and corresponding analyses are presented in the previous section.

As Stage 1 regressions in 2SLS analyses help us in curing the endogeneity problem amongst our variables of interest, they will be presented at the end of this document for reference, and not discussed/referenced moving forward. Discussions and reporting in this section will only be carried out for Stage 2 results. Stage 2 results are our primary are of scrutiny.

As Descriptive Statistics and Normality Tests remain largely the same, they will only be discussed for the first model of each financial ratio covenant's analysis, moving forward. All these tables will be presented at the end of this document for reference.

The current ratio covenant is set by lenders in the *minima*. This means that borrowers must maintain a minimum level of mutually agreed current ratio threshold. Decreasing the threshold relaxes it for borrowers, and increasing it makes it more stringent.

Besides the analysis of our main Current Ratio financial variable covenant threshold in this section, the sample comprises of the secondary Interest Coverage Ratio financial covenant, secondary Debt to Ebitda Ratio financial covenant, and the secondary Debt to Tangible Net Worth Ratio financial covenant.

4.2.2.1. Current Ratio Financial Covenant – Jones Model

Descriptive statistics from the Current Ratio covenant sample are presented in Table 4.2.2.1a. The average current ratio financial covenant threshold (CovThres) set by lenders is 1.350, with the lowest being 0.60 and the highest threshold being 2.0, among 134 borrower firms. 50% of the borrowers from the sample get a current ratio covenant between 1.250 and 2.0, from lenders. The financial variable ratio of the borrower firm, in this case presented by current ratio of the company (CRComp), has a mean of 2.037. This suggests that on average, borrower firms are clear of the average threshold by 0.65. The lowest current ratio in borrower firms sample is 0.212, with the highest current ratio being 9.376[52]. Standard deviation of cash flows from operations, and standard deviation of accruals represent the volatility of these variables and are represented by ϭCFO and ϭTA respectively. The Accrual Quality (AQ) for current ratio financial covenant analysis, is measured through the Jones Model with the variable AQJones. The average AQ is 22.4%, with 75% of the borrower firms showing AQ at or below the 37.6% level. The lowest AQ in the sample is 0, and the maximum AQ is 99%. CRAAQ is the interaction variable for Current Ratio, Accrual Levels, and Accrual Quality. LAmount is the size of the loan deal that the borrowers acquire from lenders. The minimum amount being $57,907 and the maximum borrowed amount being $14,675,768. The $14.6 Million figure is the only extreme value, with the next highest loan being $5.3 Million. OpCycle represents the variable for the operating cycles of borrowing firms. The average operating cycle is 119 days, with the lowest being 14 days, and the longest operating cycle in the sample being 321 days. FirmSize represents the size of the borrowing firm, measured through the log of total assets. Average Leverage (debt to assets) of the sample firms is 61%, with 75% of the firms at or below the 68% leverage level. The ϭ variable shows the market to book value for borrowers, with an average of 1.9 across the sample. A total of 38 firms are below the mark of 1, which hints at undervaluation of their assets. 4 borrowers obtained their loans during a period of Recession. The average Interest rate charge over the base rate by lenders for the Current Ratio covenant sample, is 2.39%, with a minimum of 1% and a maximum of 6%. The mean number of covenants per loan deal in the sample is 3, with a minimum of 1 and a maximum of 7 covenants per loan instrument.

[52] This is the only extreme value for CRComp and it is not removed from the analysis.

Table 4.2.2.1b shows the normality tests from the Kolmogorov-Smirnov and Shapiro-Wilk measures. It can be observed that besides the variable FirmSize, the rest of the population follows a non-normal distribution. As discussed in the previous section, our statistical measures do not assume normality, and hence, are not effected by a lack of it.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Besides the analysis of our main Current Ratio financial variable covenant threshold in this section, the sample comprises of the Interest Coverage Ratio financial covenant, Debt to Ebitda Ratio financial covenant, the Debt to Tangible Net Worth Ratio financial covenant, Interest variable and Covenant Number variable.

Table 4.2.2.1c shows results for the Current Ratio financial covenant threshold (CovThres) as the dependent variable. The Adjusted R Squared is 34.9%, with regression significance at the 1% level, and a Breusch-Pagan test statistic of 31% confirming homoscedasticity among the error terms. AQJones is negatively related to CovThres at the 1% level, meaning that as the quality of accruals goes up, the covenant threshold goes down. This result supports Hypothesis 1 from the structural equations. If lenders are evaluating the accrual quality favourably, then as the quality increases, borrowers receive favourable credit terms. In the case of the Current Ratio financial covenant, that comes in the form of lower thresholds. Increasing AQ, resulting in lowering of the *minimum* covenant threshold requirements by lenders. σTA is significantly positively related to CovThres at the 1% level, as hypothesized. As the volatility of the accruals increases, lenders act to secure their position by setting tighter debt covenant thresholds. A covenant set in the minima is tightened by increasing its threshold. When lenders observe fluctuating levels of accruals, the threshold on Current Ratio covenant is raised and made more stringent. OpCycle, Growth and SIC2 are significant at the 1% level, but with low beta coefficients, meaning their impact is immaterial. Pertinent to mention here that a few variables of interest have high variance inflation factors (VIFs). If the variables with high VIFs are statistically significant, then there is no need for a fix; multicollinearity expands the standard errors which in turn makes the p-values bigger. If the variables are significant at p-values of 1% or 5%, high VIFs can be set aside, as the beta coefficients are not biased, and results are statistically significant.

Unlike the Leverage Ratio analysis where all the regressions for Interest variable were insignificant, the results for the Interest variable in the Current Ratio financial covenant are all significant with some hypothesized results.

Table 4.2.2.1d shows results for Interest as a dependent variable. The regression is significant at the 5% p-value level, with an Adjusted R Squared of 8.20%. The predicted value from Debt to Tangible Net Worth ratio (DTNWR) is significant at the 5% level, with a beta coefficient of 7.7. Since the variable, DTNWRhat, is positively related to Interest an increase in the maximum threshold of the covenant leads to a corresponding increase in Interest rates. This supports Hypothesis 5, as predicted. A loosening of the maxima covenant threshold will hike the interest rates charged. Similarly, Hypothesis 7 predicts a negative relationship between Interest and number of covenants in a loan deal. That is exactly what the results support, as CovNumhat is significant at the 1% level, and with a beta coefficient of 131.2, it is *negatively* related to Interest. Lenders charge lower interest rates on loans if the number of covenants are increased, or vice versa.

CovNum analysis as a dependent variable is shown in Table 4.2.2.1e. The Adjusted R Squared is 37.4%, with the regression significant at 1% p-value level. The predicted values of Debt to EBITDA covenant and Dent to Tangible Net Worth covenant, DEbitdahat and DTNWRhat, are significant at the 1% and positively related to CovNum. As the thresholds of a maxima covenants go up (become less stringent), lenders add more financial covenants to loan instruments. It is also observed that the interaction variable for current ratio, accrual levels and accrual quality, CRAAQ, is significantly negatively related to CovNum as predicted. This means that lenders evaluate the magnitude of accruals in light of the borrower's prevailing current ratio, and then form an opinion about the quality of the accruals. A favourable, higher evaluation from lenders means there will be less oversight in the form of lesser financial covenants, as the lenders are satisfied with the CRAAQ signal.

The Debt to EBITDA (DEbitda) financial covenant as a dependent variable is shown in Table 4.2.2.1f. The regression is significant at the 1% level, with an Adjusted R Squared of 37%. CRhat (predicted value of CR threshold from Stage 1) is significant at the 5% level, and negatively related to DEbitda. This means that as the threshold of DEbitda goes up, and becomes less stringent, the threshold of current ratio covenant, CRhat, goes down and becomes lax too. The result supports the prediction about covenants behaving as complements and

substitutes to each other in loan instruments; in this case, complements. CRComp is also significantly positively related to DEbitda, further supporting the predictions in Hypothesis 5.

The results for DTNWR as a dependent variable are presented in Table 4.2.2.1g. The regression is significant at the 5% level, with an Adjusted R Squared of 28.9%. AQJones is seen to be significant at the 5% level, with a hypothesized positive relation to DTNWR. As lenders evaluate the quality of a borrower's accruals favourably, the maxima-based covenants are set loosely.

Table 4.2.2.1.h shows results for the ICR covenant. The regression is insignificant.

4.2.2.2. Current Ratio Financial Covenant – Modified Jones Model

Descriptives for the Modified Jones Model remain the same, except for the AQ measure in AQModJones (Table 4.2.2.2a). The average accrual quality for the sample is 21.2% under the Modified Jones model, with 75% of the borrowers having an accrual quality of 36.2% or lower. The minimum AQ in the sample is 0, while the maximum AQ observed is 99%.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

CovThres results for the Current Ratio threshold are presented in Table 4.2.2.2b. The regression is significant at the 1% level, with an Adjusted R Squared of 35%. The Breusch-Pagan test statistic of 28.4% confirms homoscedasticity. CovThres is significantly negatively related to AQModJones at the 1% level. This means that as the accrual quality goes up, the threshold on the CR covenant goes down, as predicted by Hypothesis 1. ϭTA is positively related to CovThres, with the variable being significant at the 1% level. Increasing standard deviation of the accruals means that the accruals are volatile and pose a risk to lender interests. Lenders adjust for this through tightening the current ratio covenant. DTNWRhat is also seen to have a positive relationship, at the 1% significance level. This means that a loosening of the DTNWR covenant threshold leads to a tightening of the CR covenant threshold, CovThres, suggesting they are substitutes for each other. Even though a predicted relationship is observed here, the beta coefficient is low, so the relationship is weak.

Interest as a dependent variable is shown in Table 4.2.2.2c. The regression is significant at the 5% level, with an Adjust R Squared of 8.6%. CovNumhat is strongly related to Interest at the 1% level, with a beta coefficient of 130, and a negative sign. As lenders increase interest rates in a loan instrument, the number of covenants are decreased, and vice versa. The finding lends further support to Hypothesis 7.

Table 4.2.2.2d shows results for the CovNum dependent variable. Adjusted R Squared is 37.9%, and the regression is significant at the 1% level. Like the predicted findings from the Jones model, DTNWRhat and DEbitdahat are significantly positively related to CovNum. Tightening of these maxima covenants will result in a corresponding reduction in the number of covenants written by lenders into a loan deal. CRAAQ is also significantly negatively related to CovNum are hypothesized, suggesting that lenders are evaluating the accrual quality of borrowers considering the accrual levels and the current ratio financial variable.

Table 4.2.2.2e shows results for the Debitda covenant threshold. The regression is significant at the 1% level, with an Adjusted R Squared of 38.6%. Interest (Inthat) is positively related to Debitda as predicted, which means that the loosening of the maxima threshold on the Debitda covenant results in lenders imposing higher interest rates on borrowers. This result will need further support from other models and covenants ahead, as a low beta coefficient suggests the relationship is weak.

Table 4.2.2.2f and Table 4.2.2.2g display insignificant regression results for the DTNWR and ICR covenant threshold dependent variables, respectively.

4.2.2.3. Current Ratio Financial Covenant – Peasnell Model

There are two changes to the descriptives of the Peasnell Model in Table 4.2.2.3a. ϭWCA measuring the volatility of accruals and AQPeasnell measuring the quality of accruals, through the Peasnell Model. The mean accrual quality for the sample goes up, at 29.5%. The minimum accrual quality in the sample is 0, and the maximum observed accrual quality is 98.4%. 75% of the borrower firms have their accrual quality at 55% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Current Ratio financial covenant threshold (CovThres) is presented as a dependent variable in Table 4.2.2.3b. The regression is significant at the 1% level, with an Adjusted R Squared of 31%, and a Breusch-Pagan statistic of 8.5% confirming homoscedastic error terms.

Like the Jones and Modified Jones results before it, CovThres is positively related to DTNWRhat, suggesting they are substitutes. But a persistence of low beta coefficient means the result is not strong. Inthat shows a predicted negative link to CovThres at the 5% level, but the low beta coefficient means the relationship is weak. On the other hand, CovNumhat has a higher beta coefficient and is significantly negatively linked to CovThres, as predicted. This means that as lenders increase the number of covenants in a loan instrument for borrowers, the corresponding CR covenant threshold is then relaxed and lowered. CRComp (Current Ratio of the borrower) is significant with the predicted positive sign, but low beta coefficient.

Table 4.2.2.3c displays results from Interest as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 16.3%. Strong hypothesized results are observed, with high beta coefficients. A negative relationship is seen between CRhat and Interest, with a beta coefficient of -206. This means that an increase (tightening) in the current ratio threshold leads to a marked decrease in the interest rates charged by lenders. CovNumhat is also highly significant at the 1% level and carries a high beta coefficient of -115.9. Lenders adjust for increase in the number of covenants, by reducing interest rates charged. Apart from the CRhat results, the DTNWRhat further supports Hypothesis 5 with a positive relationship to Interest at the 1% level. This means that increasing (loosening) thresholds on DTNWRhat leads to higher interest rates being charged.

Table 4.2.2.3d shows CovNum as a dependent variable. Adjusted R Squared is 35.4%, with the regression being significant at 1% p-value level. DTNWRhat and DEbitdahat are both significant at the 1% level, and positively related to CovNum. As the number of covenants in a loan deal are increased, the DTNWRhat thresholds and DEbitdahat thresholds are favourably adjusted for borrowers. These results are persistent across the three models so far, and in line with Hypothesis 12. Inthat is also seen to have a negative predicted link to CovNum at the 1% level, but a low beta coefficient means the result is immaterial.

DEbitda threshold is presented as a dependent variable in Table 4.2.2.3e. The regression is significant at the 5% level, with an Adjusted R Squared of 20.8%. Like the Jones Model's results, CRhat is negatively related to DEbitda at the 1% level. A less stringent current ratio threshold results in a less stringent DEbitda threshold too. This further supports the

complementary nature of these two financial covenant variables. CovNum is positively linked to DEbitda at the 1% level, with an increase in the number of covenants bringing about the predicted loosening of the maxima based DEbitda threshold. CRComp is positively significant at the 1% level, supporting predictions from Hypothesis 5.

Table 4.2.2.3f and Table 4.2.2.3g display insignificant regression results for the DTNWR and ICR covenant threshold dependent variables, respectively.

4.2.2.4. Current Ratio Financial Covenant – Dechow and Dichev (DD) Model

Two variables change for the DD model's descriptives (Table 4.2.2.4a). These are the standard deviation of working capital accruals ϬWC, and AQDD, which is the accrual quality measure through the DD model. Under this model, the average AQ for the sample is 29.7%, with the lowest AQ being 0 and the highest being 98.4%. 75% of the sample borrower firms have an AQ of 56% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.2.2.4b shows results for the CovThres dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 35.3%, and a Breusch-Pagan statistic of 22.2% confirming the data does not suffer from heteroskedasticity.

CovThres shows better results for the DD model, compared to the Peasnell model. Like the Peasnell model, DTNWRhat and CRComp are significantly positively related to CovThres at the 1% level, but with low beta coefficients. CovNumhat is also significantly negatively related to CovThres. Most importantly, and this is where the DD model outperforms the Peasnell model, is that AQDD is negatively related to Covthres at the 5% level, supporting Hypothesis 1. As the level of accrual quality rises, lenders lower the minimum current ratio threshold for borrowers, giving them favourable loan instrument terms.

Interest as a dependent variable is presented in Table 4.2.2.4c. The regression is significant at the 1% level, with an Adjusted R Squared of 20.2%. Again, the DD model outperforms all three of the previous models in this analysis. DTNWRhat is positively related to Interest at the 1% level, suggesting that relaxing the DTNWR covenant threshold leads to higher interest rates, and vice versa. Similarly, CRhat is negatively related to Interest at the 5% level, with a high beta coefficient of -188.3. This means that lenders increase interest rates on a loan deal, if

the current ratio covenant is less stringent. Both these findings support Hypothesis 5. CovNumhat is highly negatively related to Interest at the 1% level; evidence in support of the prediction that lenders adjust for higher interest rates by writing fewer covenants into loan agreements. Most importantly, AQDD is highly negatively related to Interest as well, with a beta coefficient of -84.3. When lenders evaluate the accruals of borrowers and find that the accruals are of high (low) quality, they reduce (increase) the interest rates.

Regression results for CovNum dependent variable are presented in Table 4.2.2.4d. The regression is significant at the 1% level, with an Adjusted R Squared of 33.9%. Consistent with previous results, DTNWRhat and DEbitdahat are positively linked to the number of covenants. This supports the prediction that the relaxing of maxima-based debt covenants, leads to increased oversight from lenders in the form of additional financial covenants.

Table 4.2.2.4e shows DEbitda as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 36.9%. CRhat is significantly negatively related to DEbitda, supporting the complementary nature prediction of the two financial covenants. CRComp is also positively related to DEbitda at the 1% level, further strengthening the prediction in Hypothesis 5.

Table 4.2.2.4f and Table 4.2.2.4g display insignificant regression results for the DTNWR and ICR covenant threshold dependent variables, respectively.

4.2.2.5. Current Ratio Financial Covenant – McNichols Model

There is one change in the descriptives for the McNichols model (Table 4.2.2.5a), and that is the measurement of accruals quality through the AQMcNichols variable. The average accrual quality for the sample is 52.5%, with a minimum AQ of 0 and a maximum AQ of 99.8% amongst the borrowers. 75% of the borrower firms have accrual quality of 87% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The McNichols model is the worst performing model evaluated so far, for current ratio covenant threshold. Table 4.2.2.5b presents results for CovThres. The regression is significant at the 1% level, with an Adjusted R Squared of 33.4% and a Breusch-Pagan heteroskedasticity

test statistic of 36.9%. DTNWRhat and CRComp are both positively related to CovThres at the 1% level, but with low beta coefficients. The rest of the variables of interest are insignificant.

Table 4.2.2.5c shows Interest as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 17.9%. DTNWRhat is highly significant at the 1% level, and positively related to Interest with a beta coefficient of 14.1, supporting the prediction of lenders charging higher interest rates for lax maxima-based financial covenant thresholds. CovNumhat is also strongly related to Interest, with a negative sign and a beta coefficient of -126, supporting the hypothesis that increasing interest rates lead to fewer covenants imposed by lenders, and vice versa.

Table 4.2.2.5d shows results for the CovNum dependent variable, which is significant at the 1% level and has an Adjusted R Squared of 33.3%. Consistent with prior models' results, DEbitdahat and DTNWRhat are positively related to CovNum. None of the other variables are significant.

DEbitda as a dependent variable is shown in Table 4.2.2.5e. The regression is significant at the 5% level, and has an Adjusted R Squared of 24%. Interestingly, only ϭCFO is significantly negatively related to DEbitda, as predicted in Hypothesis 5. The result suggests that lenders are evaluating the volatility of cash flows from operations, and with increasing fluctuations, set tighter DEbitda thresholds.

Table 4.2.2.5f and Table 4.2.2.5g display insignificant regression results for the DTNWR and ICR covenant threshold dependent variables, respectively.

4.2.2.6. Current Ratio Financial Covenant – Francis Model

Two changes take place in the descriptives for the Francis Model (Table 4.2.2.6a). These are the volatility of accruals measured by the variable ϭTCA, and AQFrancis, which measures the quality of accruals through the Francis Model. The average AQ for the sample is 43.9%, with the lowest AQ being 0 and the highest being 99.9%. The sample sees 75% of the borrowers have an AQ of 82% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The Francis Model does not fare better than the McNichols model, and the two models are the worst performers for the evaluations of current ratio covenant threshold.

CovThres is the dependent Current Ratio covenant threshold variable, with the results shown in Table 4.2.2.6b. The regression is significant at the 1% level, with an Adjusted R Squared of 35.6%. The Breusch-Pagan test statistic is 38.9%, confirming homoskedasticity among error terms. Like the McNichols model, the results for CovThres are weak, with only DTNWRhat and CRComp showing significant hypothesized test results, albeit with low beta coefficients.

Table 4.2.2.6c shows results for Interest as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 13%. The results only support DTNWRhat's hypothesized positive relationship to Interest, at the 5% level. Rising interest rates by lenders, leading to a reduction in the strictness of the DTNWR ratio.

Results for the CovNum dependent variable are tabulated in Table 4.2.2.6d. The regression has an Adjusted R Squared of 32.7%, which is significant at the 1% level. Consistent with prior results, DTNWRhat and DEbitdahat are positively related to CovNum, suggesting that lenders increase oversight of borrowers with increased financial covenants when the threshold on these maxima-based covenants are relaxed.

Table 4.2.2.6e shows results for the DEbitda covenant threshold. The regression is significant at the 5% level, with an Adjusted R Squared of 23.1%. Similar to the McNichols result, ϬCFO is significantly negatively related to DEbitda. Through evaluations of the Francis and McNichols models, it is observed that there is some emphasis on the cash flow component of a borrower's financials, which was not evident in the other models.

Table 4.2.2.6f and Table 4.2.2.6g display insignificant regression results for the DTNWR and ICR covenant threshold dependent variables, respectively.

4.2.2.7. Current Ratio Covenant – Summary

Through the analyses it is observed that the Dechow and Dichev model outperforms the other models while evaluating the Current Ratio covenant threshold, and this research's hypotheses. Notable observations are listed below:

Summary of the Main Findings

• Accrual Quality is considered while setting the Current Ratio covenant threshold *and* Interest rates.
• Covenants in loan deals act as complements and/or substitutes.
• Covenant Threshold, Interest and Number of Covenants are all endogenous variables.
• Interest has a direct bearing on the setting of the Current Ratio covenant threshold (unlike the finding in the Leverage Ratio covenant threshold).
• Lenders do not consider the magnitude of accruals while setting the Current Ratio covenant threshold, as none of the models show the Interaction Variable (CRAAQ) to be significant for CovThres regressions.
• Number of Covenants in a loan deal are positively related to maxima-based covenant thresholds.
• Interest Coverage Ratio and Debt to Tangible Net Worth Ratio are insignificant in CR threshold analyses as *dependent* variables and have no direct bearing on it.

5.2.3 Interest Coverage Ratio Financial Covenant

The Interest Coverage Ratio (ICR) covenant is set by lenders in the *minima*, which means lenders expect borrowers to maintain a mutually agreed upon minimum level of interest coverage, for the duration of the deal. Lenders decrease the ICR covenant threshold to relax it and tighten it up by increasing the value.

There are three secondary covenants in the Interest Coverage Ratio sample that are analysed. These are the Current Ratio covenant, the Leverage Ratio covenant, and the Debt to EBITDA (DEbitda) Ratio financial covenant.

4.2.3.1. Interest Coverage Ratio Financial Covenant – Jones Model

Descriptives from the Jones model for the ICR covenant are presented in Table 4.2.3.1a. The mean ICR threshold (CovThres) set by lenders is a minimum interest coverage ratio of 2.456. The highest is 7, and the lowest is -0.30. The negative threshold for ICR means that lenders are aware of there being borrowers who cannot meet their debt servicing requirements during the time of loan inception, hence setting the threshold accordingly. 75% of the sample firms receive an ICR threshold of 3 or less. Looking at the borrower firms' interest coverage ratio (ICRComp), indeed it is observed that nearly 30% of borrowers have an ICR of less than 1.

This means borrowing firms are unable to meet the entirety of their respective debt servicing requirements. The average ICR for borrowers is 3.267. The lowest ICRs is -556, and the highest is 921; both being extreme values. ϭCFO and ϭTA measure the volatility of cash flows from operations, and volatility of accruals, respectively. Accrual Quality as measured by the Jones Model shows a mean of 23.6% (AQJones). The minimum AQ is 0 and the maximum AQ is 99.5. Three fourths of the sample borrower firms have an AQ of 42% or less. ICRAAQ is the interaction variable for the interest coverage ratio, accrual levels, and quality of accruals. LAmount is the amount of borrowed money, scaled by total assets of the borrower firms. The average loan amount is $754,185 with a maximum of $61.6 Million and a minimum amount of $5,790. 75% of the loans acquired are below $664,000. Operating cycles of borrowing companies are represented by the OpCycle variable, which shows a mean operating cycle of 125 days for the sample. The highest operating cycle for a borrower is 1316 days, and the lowest being less than a day; both values are outliers and are not removed from the analysis. The size of the borrower firms is represented by FirmSize, with Leverage being the debt to assets indebtedness. Growth variable shows us the Market to Book ratio, with a mean of 3.5 for borrower firms. A total of 22 loan deals were conceived during a period of Recession. For the ICR covenant sample of borrower firms, the highest interest rate charged over the base rate is observed so far, with a minimum of 1% and a maximum of 12%. The average spread over base is 2.06%. There are nearly 3 covenants per loan deal in the sample, with a minimum of 1 covenant and a maximum of 7 covenants per loan instrument.

Table 4.2.3.1b shows results from the normality tests of our sample. The variables under consideration are not normally distributed, as the Kolmogorov-Smirnov and Shapiro-Wilk tests suggest. Our tests and analyses do not assume the normality of data, which is desirable but not a requirement.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

CovThres represents the ICR covenant threshold, with the regression results shown in Table 4.2.3.1c. Adjusted R Squared is 11.5%, and the regression is significant at the 1% level. Breusch-Pagan test for heteroskedasticity shows a statistic of 5.46%, suggesting the error terms are homoscedastic. CRhat is negatively related to CovThres at the 1% level. As the threshold on CR covenant is increased, the corresponding threshold on ICR covenant is decreased by lenders, and vice versa. As both the covenants are set in the minima, this means the current

ratio covenant here is behaving like a substitute to the interest coverage ratio threshold. Similarly, the LRhat variable is significantly *positively* related to CovThres. An increase (loosening) of the leverage ratio threshold results in an increase (tightening) of the ICR threshold, suggesting that LRhat is behaving as a substitute to ICR threshold as well. CovNumhat is negatively related to CovThres at the 5% level, supporting the prediction of lenders relaxing thresholds when additional covenants are added to loan instruments.

Interest as a dependent variable is presented in Table 4.2.3.1d. The regression is significant at the 1% level, with an Adjusted R Squared of 7%. Even though the overall regression gives desirable statistical results, the independent variables of concern to this research are insignificant.

Table 4.2.3.1e shows results from CovNum as a dependent variable. The Adjusted R Squared is 27.5%, with the regression being significant at the 1% level. LRhat, DEbitdahat, and ICRhat all show statistics that support Hypothesis 12. LRhat and DEbitdahat are significantly positively related to CovNum. As these covenants are set in the maxima, this means that a relaxation in their thresholds will lead to a corresponding increase in the number of covenants written into the loan deal by lenders. Similarly, ICRhat shows a negative, significant relationship to CovNum variable. As ICRhat threshold is set in the minima, this means that a tightening of the covenant will result in lenders imposing fewer financial covenants on borrowers, in loan instruments.

Current Ratio (CR) covenant threshold as a dependent variable is presented in Table 4.2.3.1f. The regression is significant at the 1% level, with an Adjusted R Squared of 30.5%. Only the DEbitdahat variable is significantly positively related to CR threshold, suggesting the two covenants are substitutes for each other. But with low beta coefficient, the result is weak. None of the other variables of interest to this research, are significant.

Table 4.2.3.1g shows results from the Leverage Ratio (LR) threshold as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 29.1%. CovNumhat is positively related to LR threshold at the 1% level, as predicted. Increasing (decreasing) number of covenants in a loan deal will make lenders set less stringent (tighter) LR thresholds. Inthat is also positively related to LR, but with a low beta coefficient.

DEbitda threshold as a dependent variable is presented in Table 4.2.3.1h. The regression is significant at the 1% level, with an Adjusted R Squared of 12.8%. Only ICRhat is significantly

negatively related to DEbitda at the 1% level. This suggests that an increase in the threshold of ICR covenant (tightening) leads to a decrease (tightening) in the DEbitda threshold. Hence, the two financial covenants act as complements to each other.

4.2.3.2. Interest Coverage Ratio Financial Covenant – Modified Jones Model

There is one change to the descriptives for the Modified Jones model (Table 4.2.3.2a). Accrual Quality is measured through the AQModJones variable. The average accrual quality for the sample is 22.1%, with a low of 0 and a high of 99.5%. 75% of the sample's borrowers are below the 40% accrual quality measure.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Interest Coverage Ratio's covenant threshold (CovThres) as a dependent variable is presented in Table 4.2.3.2b. The regression is significant at the 1% level, with an Adjusted R Squared of 11.8. The Breusch-Pagan test statistic of 13.5% confirms homoscedasticity. CRhat is significantly negatively related to CovThres, suggesting that the covenants are acting as substitutes to each other. Furthermore, LRhat is positively related to CovThres at the 1% level, making the covenant complementary to ICR threshold. Both these findings support the results from the Jones Model for ICR threshold. CovNumhat is also negatively related to CovThres at the 5% level, meaning that fewer covenants in loan deals lead to tighter ICR thresholds for borrowers.

Table 4.2.3.2c shows results from the Interest variable's regression as a dependent variable. The analysis is significant at the 1% level, with an Adjusted R Squared of 6.9%. Similar to the Jones Model, Interest variable's analysis through the Modified Jones model measure provides no material support to any of the research hypotheses.

CovNum is presented in Table 4.2.3.2d. With an Adjusted R Squared of 27.5%, the regression is significant at the 1% level. LRhat and DEbitdahat are positively related to CovNum at the 1% level, with ICRhat negatively related to CovNum at the 1% level. The findings further support the prediction that lenders tighten (loosen) covenant thresholds after reducing (increasing) the number of covenants in a loan deal.

Table 4.2.3.2e shows CR as the dependent covenant threshold variable. The regression is significant at 1%, with an Adjusted R Squared of 30.6%. DEbitdahat and Interest are significant

at the 5% levels, but with low beta coefficients, which means they impose no material change, and the relationship is weak.

Table 4.2.3.2f presents regression results for the LR covenant threshold variable. The regression is significant at the 1% level, with an Adjusted R Squared of 31.7%. CovNumhat is positively related to LR at the 5% level, meaning increases in covenant numbers lead to lax thresholds on the LR covenant.

DEbitda threshold as a dependent variable is shown in Table 4.2.3.2g. The regression has an Adjusted R Squared of 13.3%, with a p-value significance of 1%. ICRhat is significantly negatively related to DEbitda, which means that a tightening of the ICR threshold leads to a similar effect on the DEbitda threshold, hence making them complements to each other.

4.2.3.3. Interest Coverage Ratio Financial Covenant – Peasnell Model

There are two changes to the descriptives for the Peasnell Model (Table 4.2.3.3a). The volatility of accruals is measured by ϬWCA, and accruals quality is measured by the variable AQPeasnell. On average, the accrual quality of borrowers in the sample is 30.5% when measured through the Peasnell model. The minimum accrual quality is 0, while the maximum accrual quality is 100%. 75% of the sample firms have an accrual quality measure of 57% or below.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The Peasnell model's analysis performs better than the Jones and Modified Jones models before it, for Interest Coverage Ratio covenant threshold.

ICR threshold (CovThres) regression is tabulated in Table 4.2.3.3b. The regression is significant at the 1% level, with an Adjusted R Squared of 10.8%, and a Breusch-Pagan statistic of 23.7% suggesting no heteroskedasticity in the error terms. CRhat, LRhat and CovNumhat are all significant at the 1% level, carrying their hypothesized signs consistently, as evidenced in the previous two models for ICR threshold analysis. Most importantly for the Peasnell model results, AQPeasnell is significant at the 5% level with a predicted negative relation to CovThres. This means that as the quality of accruals increases, lenders give better credit terms to borrowers in the form of a lenient ICR covenant threshold. On the other hand, if lenders' evaluation of borrower accruals is not good, tighter ICR thresholds are set.

Table 4.2.3.3c shows results from the Interest variable's regression as a dependent variable. The analysis is significant at the 1% level, with an Adjusted R Squared of 6%. Consistent with previous models' results, Interest's analysis as a dependent variable through the Peasnell model's measure provides no significant independent variable results for this research.

CovNum is presented in Table 4.2.3.3d. The regression is significant at the 1% level, with an Adjusted R Squared of 27.7%. DEbitdahat and ICRhat are significantly related to CovNum, with their hypothesized positive and negative signs, respectively. Lenders increase (decrease) the number of covenants in a loan deal if these covenant thresholds are lenient (tight). Most importantly, AQPeasnell is negatively related to CovNum at the 1% level. As the lenders' evaluation of borrower accrual quality goes higher, fewer covenants are added to their corresponding loan deals. This means that the accrual quality is taken into account by lenders when different covenants are written into agreements with borrowers.

Table 4.2.3.3e shows the CR threshold as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 34.7%. DEbitdahat is positively related to CR at the 1% level, suggesting an increase in the threshold of the DEbitda covenant brings about an increase in the CR threshold. Increasing threshold for DEbitda means it gets less stringent, and an increase in the threshold for CR covenant means it gets tightened up. Hence the covenants are substitutes for each other.

Table 4.2.3.3f displays results for the LR threshold covenant. The regression is significant with an Adjusted R Squared of 12.1%. CRhat is significant at the 5% level, with a positive sign. An increase in the threshold of the Current Ratio covenant, has a similar effect on the LR threshold in the loan instrument. As the CR threshold is set in the minima, and the LR threshold in the maxima, the two covenants act as substitutes for each other.

DEbitda covenant threshold is presented as a dependent variable in Table 4.2.3.3g. The regression is significant at the 1% level, with an Adjusted R Squared of 12.4%. ICRhat is significantly negatively related to DEbitda covenant, and as discussed earlier, that makes the two covenant thresholds complementary in nature.

4.2.3.4. Interest Coverage Ratio Financial Covenant – Dechow and Dichev (DD) Model

There are two changes for the descriptives of the DD Model (Table 4.2.3.4a). ϬWC measures the volatility of accruals, and AQDD measures the quality of accruals. The average accrual

quality in the sample for the DD measure is 24.2%, with a minimum AQ of 0 and a maximum AQ of 97.5%. 75% of the firms have accrual quality of 46% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

CovThres is the ICR covenant threshold dependent variable (Table 4.2.3.4b). The regression is significant at the 1% level, with an Adjusted R Squared of 10.5%. There is no heterskedasticity among the error terms, as the Breusch-Pagan test statistic is 11%. The results are consistent with previous models. CRhat, LRhat and CovNumhat are significantly related to CovThres at the 1% level, and the variables show hypothesized results. Unlike the Peasnell Model, the DD model does not have a significant accrual quality variable.

Interest as a dependent variable is shown in Table 4.2.3.4c. The regression is significant at the 1% level, with an Adjusted R Squared of 8.2% (Table 4.2.3.4c). However, none of the independent variables of concern for this research show a significant relationship.

Table 4.2.3.4d shows CovNum as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 25.8%. DEbitdahat is positively related to CovNum at the 1% level, meaning that a relaxed DEbitdahat threshold will lead to additional covenants imposed by lenders. ICRhat threshold behaves in a similar manner to CovNum, but since Interest Coverage Ratio threshold is set in the minima, we see a negative relationship at the 1% level.

Current Ratio (CR) is shown as a dependent variable in Table 4.2.3.4e. With an Adjusted R Squared of 30.9%, the regression is significant at 1%. Only DEbitdahat is significantly positively related to CR, with a low beta coefficient. Hence the covenants are substitutes, with a weak relationship.

Leverage Ratio (LR) threshold covenant is tabulated in Table 4.2.3.4f. The regression is significant at the 5% level, with an Adjusted R Squared of 10.9%. CRhat is positively related to LR at the 5% level, supporting the notion of these covenants being substitutes. Furthermore, ϬCFO is negatively related to LR at the 5% level. This means that as the standard deviation of the cash flows from operations in a borrowing firm increase, lenders tighten up the corresponding covenant(s) to safeguard their interest.

Table 4.2.3.4g shows the DEbitda covenant threshold. The regression is significant at the 1% level, with an Adjusted R Squared of 13%. Consistent with previous results, ICRhat is negatively related to DEbitda at the 1% level. A tightening of the ICRhat threshold leads to a tightening of the DEbitda threshold as well. Hence, they are complements to each other.

4.2.3.5 Interest Coverage Ratio Financial Covenant – McNichols Model

There is one change to the descriptives in the McNichols model (Table 4.2.3.5a), and that is the variable measuring the quality of accruals, AQMcNichols. The average accrual quality in the sample is 51.5%, with the lowest AQ being 0 and the highest AQ being 100%. 75% of the borrower firms have an accrual quality of 86.8% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.2.3.5b shows the CovThres variable's regression results. It is significant at the 1% level, with an Adjusted R Squared of 6%. The error terms are homoscedastic, as the Breusch-Pagan test statistic shows a p-value of 28.7%. CRhat is negatively related to CovThres at the 5% level. An increase in CRhat threshold brings about a decrease in the ICR threshold CovThres, meaning the two covenants are substitutes for each other. LRhat is positively linked to CovThres at the 1% level, with a loosening of the LRhat threshold leading to a tightening of CovThres confirming that LRhat behaves as a substitute as well. CovNum is significant negatively related to CovThres at the 5% level, meaning lenders increase (decrease) the number of covenants in a loan agreement if the ICR threshold is set lower (higher).

Interest as a dependent variable is shown in Table 4.2.3.5c. While the regression is significant at the 1% leve, with an Adjusted R Squared of 8%, the results of the independent variables are weak and insignificant.

Table 4.2.3.5d shows CovNum as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 27.7%. LRhat and DEbitdahat are significantly positively linked to CovNum, which means that as the threshold of these covenants rises, the number of covenants in the loan deal increases. Leverage Ratio threshold and DEbitda Ratio thresholds are set in the maxima. An increase means the threshold is relaxed, which corresponds to an increase in the number of covenants, as hypothesized. Similarly, ICRhat is negatively related to CovNum at the 1% level. As ICR threshold is set in the minima, a decrease in the threshold will lead to a corresponding increase in the number of covenants, and vice versa.

CR threshold as a dependent variable is tabulated in Table 4.2.3.5e. The regression is significant, with an Adjusted R Squared of 37%. DEbitdahat portrays a significant positive relationship to CR threshold, which suggests they are substitutes, but with a low beta coefficient the relationship is weak.

Table 4.2.3.5f shows results from the LR threshold regression. It is significant at the 5% level, with an Adjusted R Squared of 9.5%. CRhat is positively linked to LR, which means that an increase or tightening of the CR threshold results in an increase or relaxation of the LR threshold. Hence the two covenants behave as substitutes.

DEbitda threshold is presented in Table 4.2.3.5g. The regression is significant at the 1% level, with an Adjusted R Squared of 13.7%. ICRhat is significantly negatively related to DEbitda, which means the two covenants are complementary in nature.

4.2.3.6. Interest Coverage Ratio Financial Covenant – Francis Model

There are two changes for the descriptives of the Francis Model (Table 4.2.3.6a). ϭTCA measures the volatility of accruals, and AQFrancis measures the quality of accruals through the Francis model. The average accrual quality in the sample is 41.4%, with the lowest AQ being 0 and the highest AQ being 100%. Three fourths of the borrowers have accrual quality of 76.4% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.2.3.6b shows results for the CovThres variable. The regression is significant at the 1% level, with an Adjused R Squared of 11.7%. A Breusch-Pagan test statistic of 23.7% confirms homoscedasticity among error terms. Consistent with previous results, CRhat and LRhat are significantly linked to CovThres at the 1% level, with the predicted signs suggesting the covenants are substitutes to ICR threshold. CovNumhat is negatively linked to CovThres at the 1% level, as hypothesized.

Interest variable is shown in Table 4.2.3.6c. The regression is significant with an Adjusted R Squared of 7.6%, but the independent variables show no material support to hypothesized results. This has been a consistent outcome throughout all models for ICR.

CovNum as a dependent variable is presented in Table 4.2.3.6d. The regression is significant at the 1% level, with an Adjusted R Squared of 30.5%. LRhat and DEbitdahat are positively linked to CovNum, and ICRhat is negatively related to CovNum as predicted. A tightening of

the thresholds results in a relaxation in the number of covenants imposed by the lenders, and vice versa. Furthermore, ϬTCA is also positively related to CovNum at the 5% level, which means that the increasing volatility of accruals forces lenders to increase oversight of the borrowing firms by adding additional covenants to the loan instruments.

Table 4.2.3.6e shows the CR threshold as a dependent variable. The regression is significant at the 5% level, with an Adjusted R Squared of 30.3%. ICRhat is negatively linked to CR at the 1% level, further supporting the 'substitute covenant' results from the CovThres regression. An increase in the ICRhat threshold leads to a decrease in the CR threshold, and vice versa.

Table 4.2.3.6f presents results from the LR threshold. The regression is significant at the 1% level, with an Adjusted R Squared of 20.1%. None of the variables of interest to this research are seen to be significant.

DEbitda threshold is shown in Table 4.2.3.6g. The Adjusted R Squared is 18.6% with the regression being significant at the 1% level. ICRhat is negatively related to DEbitda at the 1% level, supporting the notion of the covenants being complements to each other. Interestingly, we see hypothesized results on the CovNum and AQFrancis variables as well. CovNum is significantly, positively linked to DEbitda at the 1% level. This means that an increase in the number of covenants in a loan deal by lenders, leads to a lenient threshold on the DEbitda covenant. AQFrancis is also positively linked to DEbitda at the 5% significance level. As lenders' positive evaluation of the quality of borrower accruals increases, the corresponding thresholds on the covenants are set in a more lenient manner.

4.2.3.7. Interest Coverage Ratio Covenant - Summary

The Peasnell Model outperforms all the rest of the accrual models for ICR covenant evaluations, and the related hypotheses. The main findings from the analyses are listed below:

Summary of the Main Findings
• Different covenants act as complements as well as substitutes to each other in a loan instrument.
• Accrual Quality is taken into consideration by lenders for setting covenant thresholds.
• Accrual Quality also determines the Number of Covenants lenders write into loan agreements for borrowers.
• Interest has no direct bearing on the threshold determination of ICR.

• The interaction variable (ICRAAQ) is insignificant and immaterial across all the models, which means lenders do not take the magnitude of accruals into account while setting the ICR threshold.
• Number of Covenants in a loan deal are negatively linked to minima covenants, and positively linked to maxima covenants.
• Leverage Ratio threshold has a weak role in determining the loan structure for deals that have ICR threshold as the central dependent variable.

5.2.4. Debt to EBITDA Financial Covenant

The Debt to EBITDA (DEbitda) covenant threshold is set by lenders in the *maxima*. Borrowers can reach a certain level of debt relative to their earnings, going beyond which will constitute a technical default, and lenders will intervene. This means that there is an upper limit set on the levels of debt that can be attained by borrowers. If lenders need to relax the covenant, the DEbitda threshold is increased, and for a stricter covenant the threshold is decreased.

The two secondary covenants in the DEbitda financial covenant analysis are the Current Ratio covenant, and the Interest Coverage Ratio covenant.

4.2.4.1. Debt to EBITDA Financial Covenant – Jones Model

The DEbitda ratio financial covenant descriptives are presented in Table 4.2.4.1a. The sample consists of 368 loan deals, with the mean covenant threshold (CovThres) set by lenders being 4.2. This means that borrowers are allowed to take debts amounting nearly four times their earnings. The minimum threshold in the sample is 0.4, and the maximum threshold is 15; both being extreme values. 75% of the borrowers get a maximum DEbitda covenant of 5, or lower. The average prevailing DEbitda ratio of borrower firms (DEbitdaComp) at the time of loan inception, is 5.15. This means that there will be firms that are already in technical default at the time the agreements are signed. Unlike previous practice in the literature, such firms are not omitted from the sample[53]. Accrual quality is measured through the variable AQJones, for the Jones model. The mean AQ in the sample is 20.9%, with the lowest being 0 and highest AQ being 97.5%. 75% of the borrowers have accrual quality of 36% or lower. The interaction

[53] As discussed in the Research Design section.

variable for the DEbitda ratio is DEAAQ, which moderates the relationship between the financial variable, accrual levels, and accrual quality. The average loan amount (LAmount) acquired by borrowers is $658,170. The operating cycles of these firms vary between a minimum of one week, and a maximum of 1316 days[54]. The mean OpCycle for firms in the sample is 124 days. The average FirmSize is 6.257, with the smallest firm being 0.382, and the largest borrower being 10.33. As the Growth variable shows the Marker to Book Value, extreme positive and negative values hint towards overvaluation and undervaluation of the borrowers' assets. While the mean Growth is 2.51, the minimum value from the sample is -97, and the maximum value is 42. A total of 12 loan deals were signed during a period of economic recession. Lenders charge an additional 2.02% interest over and above the base rate on average, with a maximum of 5% being charged from borrowers. Nearly 3 financial covenants are observed per loan deal, with a minimum of 1 covenant and a maximum of 7 covenants per loan instrument. 75% of the firms have 3 or fewer covenants in their agreements.

Table 4.2.4.1b shows the Kolmogorov-Smirnov and Shapiro-Wilk tests to check distribution of our sample data. FirmSize shows a normal distribution in both measures of normality, while the rest of the variables are not observed to have a normal distribution.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The results from the second stage regression of 2SLS for DEbitda covenant threshold (CovThres) is presented in Table 4.2.4.1c. The regression is significant at the 1% level, with an Adjusted R Squared of 14.7%. A Breusch-Pagan statistic of 32.4% confirms homoscedasticity of error terms. ICRhat is significantly related to CovThres at the 1% level, with a positive sign. This means that an increase in the ICR threshold (tightening) leads to an increase in the DEbitda threshold (relaxed). ICRhat behaves as a substitute covenant to the dependent threshold of DEbitda. CovNumhat is also highly significant, with a positive sign on the beta coefficient, suggesting that an increase in the number of covenants by lenders, leads to a lenient threshold set for DEbitda covenant, as predicted. Interestingly, support for Hypothesis 5 is also observed. The financial variable of the borrowers at the time of loan inception, DEbitdaComp is positively related to CovThres, has a statistical significance of 1%, and has a beta coefficient between 0 and 1, as predicted. As the DEbitda ratio of the borrowers

[54] The extreme value shows a firm in operational difficulties. This research does not exclude outliers.

increases, lenders set the threshold higher on the covenants, to not intervene needlessly. The greatest benefit to lenders on intervention is when the expected benefits from intervention outweigh the expected costs of intervention. If higher DEbitda ratio of the firm is a normal 'fluctuation' at the time of the business cycle for a borrower, a seasonal effect, or indeed a norm in the sector that the borrower operates in, then lenders take that into consideration while setting threshold levels.

Interest as a dependent variable is shown in Table 4.2.4.1d. The regression is significant at the 5% level, with a low Adjusted R Squared of 2.3%. ICRhat is significantly negatively related to Interest, with a high beta coefficient, as hypothesized. As lenders increase the threshold on ICRhat and tighten it for borrowers, a corresponding lowering of the interest rates is observed. Another important finding here is the significantly positive relationship of DEbitdaComp to Interest. The finding supports the Hypothesis 5 result from the CovThres regression in Table 4.2.4.1c. As the Debt to EBITDA ratio of borrower firms increases, lenders raise the interest rates. This lends more support to the endogeneity argument of this research, between covenant threshold, interest rates, and number of covenants in a loan instrument. In this case, lenders are relaxing the DEbitda threshold with an increasing borrower DEbitda ratio to avoid unnecessary interventions, but they are also insuring those decisions with an increased rate of interest charged on the loan.

Table 4.2.4.1e shows CovNum as the dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 14.5%. None of the variables of concern from the model, show significance to this research. None of the variables of concern that are related to the hypotheses formulated, are significant. Interestingly, FirmSize which is used as a control variable, is significantly negatively related to CovNum. This is a finding from Bradley and Roberts (2004), that is replicated in this research's findings. FirmSize can be used as a proxy for the number of covenants in a loan deal.

Current Ratio threshold (CR) is presented in Table 4.2.4.1f. It is significant at the 1% level, with an Adjusted R Squared of 40%. Accrual quality, interest charged, and volatility of cash flows have the predicted signs, but the variables are insignificant at the 1% and 5% p-value levels.

ICR threshold is presented in Table 4.2.4.1g. With an Adjusted R Squared of 13.2%, the regression is significant at 1%. CRhat is negatively related to ICR threshold at the 1% level, with an increasing CRhat threshold leading to a decrease in the ICR covenant threshold. As

both the thresholds are set in the minima, the CRhat covenant act as substitute to ICR. Furthermore, DEbitdahat is negatively related to ICR threshold. This result is consistent with the results from the ICR covenant as a primary dependent variable in section 4.2.3. It is also observed that CovNum is significantly negatively related to ICR at the 1% level, suggesting that lenders tighten the ICR threshold when the number of covenants in loan deals with DEbitda ratio as a primary covenant, are decreased.

4.2.4.2. Debt to EBITDA Financial Covenant – Modified Jones Model

There is one change to the descriptive analysis results for DEbitda covenant threshold under the Modified Jones Model (Table 4.2.4.2a). AQModJones measures the accrual quality for the borrower sample, with the average AQ being marginally lower than the Jones Model measure, at 20.4%. The lowest accrual quality in the sample is 0, and the highest accrual quality for a borrower is 97.5%. 75% of the borrower firms have an AQ of 34.7% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.2.4.2b shows the DEbitda covenant threshold as the dependent variable (CovThres). It is significant at the 1% level, with an Adjusted R Squared of 17.8%. The Breusch-Pagan test's p-value of 43.9% confirms homoscedastic error terms. Unlike the Jones Model results, CovNum is insignificant which makes the Modified Jones model analysis weaker, comparatively. Though DEbitdaComp is significantly positively related to CovThres, and has a beta coefficient between 0 and 1, supporting Hypothesis 5. ICRhat is also positively linked to CovThres at the 1% level, confirming its nature as a substitute to DEbitda covenant threshold.

Interest as a dependent variable is shown in Table 4.2.4.2c. Unlike the Jones Model results, the regression overall is insignificant at the 1% and 5% levels, even though DEbitacomp is significantly positively related to Interest at the 1% level, as hypothesized.

Table 4.2.4.2d shows CovNum as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 14.3%. Again, none of the hypothesized relationships are seen amongst the variables, but FirmSize is negatively related to CovNum, suggesting that the size of the firm can be a proxy for the number of covenants in a loan deal.

CR is presented in Table 4.2.4.2e. The regression is significant at the 1% level, with an Adjusted R Squared of 38.4%. The independent variables of concern do not show any hypothesized relationships.

Table 4.2.4.2f shows the ICR threshold as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 11.4%. CRhat is significantly negatively related to ICR threshold, behaving as a substitute. DEbitdahat is also negatively linked to ICR threshold. But as they are set in the maxima and minima thresholds respectively, DEbitdahat is complementary to ICR threshold. CovNumhat shows hypothesized relation, as it is negatively linked to ICR threshold at the 5% level. Increasing number of covenants lead to lenient ICR covenant threshold set by lenders.

4.2.4.3. Debt to EBITDA Financial Covenant – Peasnell Model

Two changes are seen to the descriptive analysis for the Peasnell model variables (Table 4.2.4.3a). The volatility of accruals is measured by ϬWCA, and the quality of accruals is measured by AQPeasnell. The mean AQ rises significantly for the sample, through the Peasnell model, at 30.8%. The minimum AQ is 0, and the maximum accrual quality in the borrowing firms' sample is 100%. Three fourths of the borrowers have an AQ of 55.5% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The Peasnell Model performs better than the Jones and Modified Jones Models before it. CovThres as a dependent variable is presented in Table 4.2.4.3b. The regression is significant at the 1% level, with an Adjusted R Squared of 15%, and a Breusch-Pagan p-value of 50.30 confirming homoscedastic error terms. Consistent with the Jones Model results, ICRhat, CovNumhat, and DEbitdaComp are all positively related to CovThres at the 1% significance level. ICRhat displays its substitute nature to DEbitda threshold. An increase in CovNumhat relaxes DEbitda threshold as predicted, and DEbitaComp has a beta coefficient of 0.54, which is between 0 and 1.

Table 4.2.4.3c shows the results for Interest regressions for Stage Two 2SLS. The regression is insignificant overall, even though ICRhat and DEbitdaComp show significant and hypothesized links to the Interest component of loan deals.

CovNum is shown in Table 4.2.4.3d. The regression is significant at the 1% level, with an Adjusted R Squared of 14.7%. Consistent with previous results, hypothesized links from this research are not observed. But results from the literature are supported by the significant negative relationship between FirmSize and CovNum, which supports the finding from Bradley and Roberts (2004) that FirmSize can be used as a proxy for CovNum.

CR threshold is presented in Table 4.2.4.3e. The regression is significant at the 1% level, with an Adjusted R Squared of 43.5%. The independent variables of interest do not show any hypothesized relationships.

Table 4.2.4.3f shows the ICR threshold as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 11.9%. Consistent with previous results, CRhat and DEbitdahat are both negatively related to ICR, supporting the notion of their substitute and complementary nature to ICR threshold, respectively. CovNumhat is also negatively linked to ICR at the 1% level. The most important finding is that of the hypothesized relationship between DEAAQ and ICR. The interaction variable is negatively related to ICR threshold, which means that lenders consider the relationship between the underlying covenant's firm specific ratio, the accrual levels, and the quality of accruals, while setting the ICR threshold. As the lenders' evaluation goes higher (positive evaluation), the ICR threshold is set leniently. Borrowers get better credit terms when lenders evaluate DEAAQ favourably.

4.2.4.4. Debt to EBITDA Financial Covenant – Dechow and Dichev (DD) Model

The descriptive analysis for DD model variables is shown in Table 4.2.4.4a. There are two changes. The working capital accruals variable, that is measured by ϬWC, and the AQDD variable that measures the quality of accruals through the DD model. The average AQ for the sample is lower than the Peasnell model, at 25%. The minimum AQ is 0, while the maximum AQ in the borrower sample firms is 97%. 75% of the firms have an accrual quality of 49% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The DD model performs better than the Peasnell model by returning a significant regression, and hypothesized relationships between independent variables and Interest. But, unlike the Peasnell model, fails to provide material relationships on the accrual quality evaluations by lenders.

Table 4.2.4.4b shows CovThres as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 16.6%. There is no heteroskedasticity among the error terms, as confirmed by a Breusch-Pagan statistic of 7.1%. Consistent with previous model results, ICRhat, CovNumhat and DEbitdaComp are all positively related to CovThres at the 1% level.

Interest is displayed in Table 4.2.4.4c. The regression is significant at the 5% level, albeit with a low Adjusted R Squared of 2.5%. ICRhat has the hypothesized negative sign, at a significance level of 1%, and beta coefficient of -7.161. This means that a tightening of the ICR threshold by lenders leads to a reduction in the interest rates charged by lenders. DEbitdaComp is positively related to Interest at the 5% level, suggesting that rising debt levels from borrowers result in lenders charging higher interest rates in loan agreements.

CovNum as a dependent variable is presented in Table 4.2.4.4d. The regression is significant at the 1% level, with an Adjusted R Squared of 15.5%. Consistent with the results so far from the other models, FirmSize is negatively related to CovNum at the 1% level.

The CR threshold is shown in Table 4.2.4.4e. The Adjusted R Squared is 39.9%, with the regression significant at the 1% level. Although the variables of interest are insignificant, the accruals quality variable AQDD shows the hypothesized negative sign. It is marginally insignificant at 5.6%.

The ICR threshold is presented in Table 4.2.4.4f. The Adjusted R Squared is 12.9% with the regression being significant at the 1% level. CRhat and DEbitdahat are consistently showing their substitute and complementary role towards the ICR threshold. Furthermore, it is observed that the volatility of accruals σWC, is positively related to ICR threshold. This means that as the volatility of accruals increase, the ICR threshold is increased and tightened, supporting the prediction that rising accrual volatility leads to stricter credit terms from lenders.

4.2.4.5. Debt to EBITDA Financial Covenant – McNichols Model

There is one change to the descriptives of the McNichols model, and that comes in the form of the accrual quality variable, AQMcNichols (Table 4.2.4.5a). The analysis sees the highest average AQ measure for the borrower firms that have the DEbitda financial covenant written into their loan agreements by lenders. The mean AQ is 52.2%, with the lowest accrual quality

being 0 and the highest accrual quality being 100%. Three fourths of the sample firms have accrual quality at, or below the 83.8% level.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The McNichols model outperforms all other models so far, for DEbitda covenant analysis.

Table 4.2.4.5b shows results of the CovThres dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 16.5%. The Breusch-Pagan test statistic of 12.1% confirms no heteroskedasticity among the error terms. ICRhat, CovNumhat and DEbitdacomp are all carrying hypothesized signs, and are significantly related to CovThres at the 1% level. Most importantly, the interaction variable DEAAQ is significantly positively related to CovThres at the 5% p-value level. This means that as lenders favourably evaluate the effect of the magnitude of accruals on the financial covenant, and the accrual quality, they give desirable credit terms to borrowers. Specifically, as the value of DEAAQ increases, lenders relax the DEbitda covenant (Hypothesis 2).

Interest as a dependent variable is presented in Table 4.2.4.5c. The overall regression is marginally insignificant, with the DEbitdaComp variable showing a significantly positive relation to interest rates being set by lenders.

CovNum is shown in Table 4.2.4.5d. The regression is significant at the 1% level, with an Adjusted R Squared of 14.6%. Like previous results, FirmSize is significantly negatively related to the number of covenants in a loan deal.

CR threshold is displayed as a dependent variable in Table 4.2.4.5e. The regression is significant the 1% level, with an Adjusted R squared of 38.8%. There is no change in the results from previous analyses, and the variables of interest to this research show no material effect on the dependent variable.

Table 4.2.4.5f shows the ICR covenant as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 12.9%. CRhat, DEbitdahat, and CovNumhat are all showing hypothesized results, at significance levels of 1%. In addition to these, the model also shows a highly significant positive relation between the volatility of accruals σWC, and ICR threshold. That means that as the volatility of accruals rises, lenders set tighter ICR threshold by raising the minimum coverage that borrowers need to maintain. Furthermore,

DEAAQ is also significantly *negatively* related to ICR threshold, as predicted. Increasing lender faith in the accrual component of earnings of borrowers, leads to better credit terms in the form of relaxed covenant thresholds.

4.2.4.6. Debt to EBITDA Financial Covenant – Francis Model

There are two changes to the Francis Model's descriptives (Table 4.2.4.6a). The volatility of accruals is measured by the variable ϬTCA, and the accrual quality is measured by AQFrancis. The average accrual quality for the sample is lower than the McNichols model, at 41.8%. The lowest AQ is 0, and the high AQ is 99.7%. From the borrower sample, 75% of the firms have an accrual quality of 78% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The Francis model performs slightly better than the McNichols model for the DEbitda covenant analysis.

CovThres as a dependent variable is shown in Table 4.2.4.6b. The regression is significant at the 1% level, with an Adjusted R Squared of 15.7%. No heteroscedasticity among the error terms is confirmed by a Breusch-Pagan statistic of 19.4%. Consistent across all the models, we see hypothesized results for ICRhat, CovNumhat, and DEbitdaComp at the 1% level. Importantly, the Francis Model is the only one to support Hypothesis 1 for DEbitda covenant threshold. Specifically, AQFrancis is significantly positively related to CovThres at the 5% level. As the accrual quality of a borrowing firm increases, lenders incorporate that into setting the DEbitda threshold, and set it leniently.

Interest as a dependent variable is shown in Table 4.2.4.6c. The regression is significant at the 5% level, with an Adjusted R Squared of 2.3%. DEbitdaComp is positively related to Interest at the 5% level, which means that borrowers with higher debt levels get steeper interest rates written into their loan contracts by lenders.

Table 4.2.4.6d shows the CovNum variable. The regression is significant at the 1% level, with an Adjusted R Squared of 18.7%. Apart from the consistent finding of FirmSize negatively related to CovNum, it is observed that the volatility of accruals also has an impact on the number of covenants in a loan deal. ϬTCA is positively related to CovNum at the 1% level,

suggesting that lenders impose additional financial covenants on borrower firms, when the accruals levels are fluctuating. This is in line with Hypothesis 5.

CR threshold results are displayed in Table 4.2.4.6e. The regression is significant at the 1% level, with an Adjusted R Squared of 42.8%. Interestingly, interaction variable DEAAQ is significantly negatively related to CR threshold at the 5% level. This means that as lenders evaluated the accruals and the underlying financial variable favourably, they set a relaxed CR threshold. Again, this is in line with Hypothesis 2.

Table 4.2.4.6f shows the ICR covenant threshold as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 12.3%. CRhat is negatively linked to ICR, and as both he covenants are set in the minima, CRhat behaves as a substitute to ICR covenant threshold. DEbitdahat is also negatively linked to ICR at that 1% level, suggesting that DEbitdahat acts as a complement to the ICR covenant threshold. Furthermore, as has been observed consistently throughout the analysis, CovNumhat is significantly negatively related to ICR. This supports the prediction that lenders reducing the numbers of covenants in a loan deal and set stricter ICR thresholds, or vice versa.

4.2.4.7. Debt to EBITDA Ratio – Summary

The Francis and McNichols models are the best performing models for DEbitda threshold analyses, with the Francis model being fractionally better. The main findings from the results are as follows:

Summary of the Main Findings
• Lenders do not take the number of covenants variable (CovNum) into account, directly. The research supports findings from Bradley and Roberts (2004), who find that FirmSize is a proxy for CovNum, and the two variables are negatively related. Consistent results for this relation are observed across all models.
• Interest is considered by lenders, with the primary focus being on the financial variable (DEbitda) of the borrower company at loan inception. The relationship is consistent, and significant across all models, as predicted.
• Further support of the prediction that multiple covenants in a loan deal can be complements and/or substitutes to each other, is shown.
• Interaction variable specific to this research (DEAAQ), is also evaluated by lenders while setting debt covenant thresholds.

• Lenders make use of the Quality of Accruals, and Volatility of Accruals metrics before agreeing credit terms with borrowers.

4.2.5. Debt to Tangible Net Worth Ratio Financial Covenant

The Debt to Tangible Net Worth (DTNW) financial covenant is set by lenders in the maxima. Lenders expect borrowers to stay *below* a mutually agreed upon threshold, for the duration of the loan deal. DTNW covenant is relaxed by increasing the threshold level and made stringent by lowering the threshold. When maximum DTNW Ratio is breached, and borrowers enter technical default, lenders intervene to secure their interests.

4.2.5.1. Debt to Tangible Net Worth Ratio Financial Covenant – Jones Model

Descriptives related to the DTNW financial covenant's evaluation through the Jones Model, are presented in Table 4.2.5.1a. There are a total of 67 loan deals, with no missing values. The mean DTNW covenant threshold (CovThres) is 2.325, with the lowest being 0.4, and the highest being 12.1. 75% of the borrowers get a maximum DTNW covenant of 2.75 or lower, from lenders. The financial variable at loan inception for borrowers, DTNWComp, has an average of 1.771. This means that borrowers are well below the maximum DTNW covenant threshold set by lenders, on average. The lowest DTNWComp value for a borrower is -31, and the highest is 45, with both debt levels being extreme values. Volatility on cash flows from operatios is measured by its standard deviation, ϬCFO. The volatility of accruals is measured by the standard deviation of the total accruals variable for the Jones Model, ϬTA. AQJones measures the quality of accruals of borrowers. The average AQ in borrowing firms is 15.2%, with the lowest AQ in the sample being 0, and the highest being 74.5%. Three fourths of the sample firms have an AQ of 28.6% or lower. DTNAAQ is the interaction variable for the Debt to Tangible Net Worth ratio, the levels of accruals, and the quality of accruals. LAmount is the size of the loan given out by lenders, with the average loan being $637, 238. The average operating cycle (OpCycle) for borrowers that have the DTNW financial covenant written into their loans, is 161 days: with the lowest operating cycle being 28 days and the highest operating cycle being 794 days. FirmSize represent the size of the borrowing firm, calculated through the log of its total assets. The average FirmSize is 4, with the largest firm being 8, and the lowest firm being an outlier having a value of 0.38. The sample's borrower firms portray a reasonable

debt to assets ratio (Leverage), with the average value being 51.6%. 75% of the firms have a leverage of less than 62%. The market to book ratio measures the Growth variable, with an average value of 2 suggesting no material cause for concern among the borrower sample. Lenders charge a mean value of 2.07% interest over and above the base rate. A low of 0, and a high of 5% is observed. Unlike all the other financial covenants studied so far, the DTNW covenant sample of borrowing firms has a minimum of 2 covenants per loan deal, with a maximum of 6 covenants per loan deal. Furthermore, the DTNW financial covenant is the only one in this research that no recession periods. That is, lenders do not write the DTNW financial covenant into loan agreements for borrowers, during periods of recession.

Table 4.2.5.1b shows the normality tests for DTNW covenant's borrower sample variables. The tests are performed through the Kolmogorov-Smirnov, and Shapiro-Wilk measures. ϬTA and FirmSize are normally distributed, with the rest of the variables not following a normal distribution. As the tests that are performed in this research do not assume normality of the data, the results are unaffected.

Debt to Tangible Net Worth covenant analysis includes studying the effects of the Current Ratio covenant, and the Interest Coverage Ratio covenant.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

DTNW threshold (CovThres) as a dependent variable is shown in Table 4.2.5.1c. The regression is significant at the 1% level, with an Adjusted R Squared of 38.5%. Breusch-Pagan test statistic is 77.6%, which means the error terms are homoscedastic. DTNWComp, the financial variable of the borrowing firm at the time of loan inception, is positively linked to CovThres at the 1% level, with a beta coefficient between 0 and 1. The result supports Hypothesis 5, as lenders increase the threshold level of the DTNW covenant with rising values on the DTNW ratio of the borrowers. The volatility of accruals, ϬTA is negatively linked to CovThres at the 5% level, with a high beta coefficient of -31. Supporting Hypothesis 5 as well, this means that as the fluctuations in the accrual levels increase, lenders act to secure their interests by tightening the DTNW threshold. Furthermore, a high beta coefficient is observed on the AQJones variable, measuring the accrual quality of borrower firms. It is positively linked to CovThres. As the quality of borrower accruals increases, lenders give favourable

credit terms to borrowing firms by relaxing the DTNW covenant. The result supports Hypothesis 1.

CovNum as a dependent variable is presented in Table 4.2.5.1d. The regression is significant at the 5% level, with an Adjusted R Squared of 16.5%. Although CRhat and ICRhat are significant at the 1% level, their positive signs are not hypothesized. Since the predictions for these variables are one-tailed, the relationship is insignificant to this research.

Interest variable, CR threshold and ICR threshold are all insignificant at the 1% and 5% p-value levels. They are tabulated in Table 4.2.5.1e, 4.2.5.1f, and 4.2.5.1g respectively.

4.2.5.2. Debt to Tangible Net Worth Ratio Financial Covenant – Modified Jones Model

There is one change to the Modified Jones model's descriptives for DTNW financial covenant analysis (Table 4.2.5.2a). AQModJones measures the accrual quality of borrowers through the Modified Jones model. The average AQ for the sample is 13.9%, with the lowest being 0 and the highest AQ being 73.1%. 75% of the borrowing firms have their accrual quality at or below 18.8%.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The Modified Jones model performs poorly compared to the Jones model, for the DTNW covenant analysis. CovThres is presented in Table 4.2.5.2b. The regression is significant at the 1% level, with an Adjusted R Squared of 37.40%, and homoscedastic error terms. DTNWComp is significantly positively related to CovThres at the 5% level, as hypothesized. Increasing levels of Debt to Tangible Net Worth for borrowers, lead to the threshold for the covenant being set higher by lenders. The other variables of interest to this research are not statistically significant.

CovNum as a dependent variable has a significant regression, with an Adjusted R Squared of 17.4%, but with no independent variables showing hypothesized results (Table 4.2.5.2c). Interest, CR threshold and ICR threshold have insignificant regressions. These are presented in Table 4.2.5.2d, 4.2.5.2e, and 4.2.5.2f respectively.

4.2.5.3. Debt to Tangible Net Worth Ratio Financial Covenant – Peasnell Model

Descriptives for the Peasnell model are presented in Table 4.2.5.3a. There are two changes. The volatility of accruals is measured by ϭWCA, and the quality of accruals is measured by AQPeasnell. The average AQ in the sample is 26.9%, with the lowest being 0, and the highest AQ being 94.2%. A total of 75% of the borrowers have their accrual quality at or below 52.9%.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The Peansell Model performs at par with the Jones model, with hypothesized results. CovThres as a dependent variable is shown in Table 4.2.5.3b. The regression is significant at the 1% level, with an Adjusted R Squared of 39.6%. A Breusch-Pagan test statistic of 82.8% shows that the error terms are homoscedastic. CovNumhat is positively related to CovThres at the 1% level, with a high beta coefficient. This means that as the number of covenants in a loan deal are increased by lenders, the corresponding threshold on the DTNW covenant is relaxed. DTNWComp is significantly positively related to CovThres, supporting Hypothesis 5 further. Similarly, volatility of accruals and the quality of accruals variables are highly significant, with high beta coefficients. ϭWCA is significantly negatively related to CovThres at the 1% level, meaning that as the volatility of accruals increases, lenders give stricter credit terms to borrowers by tightening the threshold on DTNW covenant. AQPeasnell is significantly positively related to CovThres, suggesting that as the quality of accruals increases for borrowers, lenders take that into consideration and set lenient thresholds on DTNW covenant.

CovNum as a dependent variable is shown in Table 4.2.5.3c. The regression is significant, but with the independent variables providing no material information for this research. Interest, CR threshold and ICR threshold have insignificant regressions. These are presented in Table 4.2.5.3d, 4.2.5.3e, and 4.2.5.3f respectively.

4.2.5.4. Debt to Tangible Net Worth Ratio Financial Covenant – Dechow and Dichev (DD) Model

There are two changes to the descriptives for the DD model (4.2.5.4a). ϭWC measures the volatility of accruals, and AQDD measures the quality of accruals of borrowers. The average AQ in the sample is 27%. The lowest accrual quality for a borrower in the sample is 0, while the highest AQ is 98.4%. Three fourths of the sample firms have an accrual quality of 52% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

DTNW threshold (CovThres) is presented as a dependent variable in Table 4.2.5.4b. The regression is significant at the 1% level, with an Adjusted R Squared of 43.3%. There is no heteroskedasticity among the error terms, which is confirmed by the Breusch-Pagan statistic of 12.5%. Inthat is significantly positively related to CovThres at the 1% level. Lenders increasing the interest rates on a loan agreement lead to a corresponding relaxation of the DTNW threshold. As the beta coefficient on the Inthat variable is low, the result is weak. Consistent with previous results, it is observed that DTNWComp is significantly positively related to CovThres, with a beta coefficient between 0 and 1. Volatility of cash flows (ϭCFO) is observed to be significantly negatively related to CovThres at the 1% level, with a high beta coefficient of -26.6. This means that as the cash flows from operations fluctuate, lenders react to the signal by tightening the covenant threshold, as predicted. Accrual quality variable AQDD is positively related to CovThres at the 5% level, with an increase in the quality of borrower accruals resulting in better credit terms from lenders.

Pertinent to mention here that for the Peasnell model CovNumhat and ϭWCA showed hypothesized results for CovThres. For the DD model, Inthat and ϭCFO are displaying predicted relationships. DTNWComp and AQ variables are significant for both models along hypothesized lines.

CovNum as a dependent variable has a significant regression, with an Adjusted R Squared of 18.5%, but with no independent variables showing hypothesized results (Table 4.2.5.4c). Interest, CR threshold and ICR threshold have insignificant regressions. These are presented in Table 4.2.5.4d, 4.2.5.4e, and 4.2.5.4f respectively.

4.2.5.5. Debt to Tangible Net Worth Ratio Financial Covenant – McNichols Model

The McNichols model descriptive analysis has one change in variables (Table 4.2.5.5a). Accrual Quality is measured through the AQMcNichols variable. The average AQ is the highest across all models, at 53.7%. The lowest accrual quality among borrower firms is 0, while the highest is 100%. 75% of the borrowing firms have an AQ of 89.6% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

CovThres as a dependent variable is seen in Table 4.2.5.5b. The regression is significant at the 1% level, with an Adjusted R Squared of 43%, and homoscedastic error terms. DTNWComp is significalt positively related to CovThres at the 1% level, with its beta coefficient satisfying

Hypothesis 5. Accrual quality of borrowers, and the interaction variables are both highly significant as predicted. AQMcNichols has a beta coefficient of 3.8 and is positively related to CovThres at the 5% level. Rising accrual quality resulting in favourable credit terms from lenders. Furthermore, DTNAAQ is significantly positively related to CovThres at the 5% level as well. This means that along with accrual quality, lenders look at the level of accruals for borrowers and the financial variable. An increasing DTNAAQ measure results in lowering the risk profile of borrowers, which in turn helps borrowers secure lax covenant thresholds.

ICR threshold as a dependent variable is presented in Table 4.2.5.5.c. This is the first instance across the different models analysed, that the ICR threshold is significant in the DTNW covenant analysis. The regression has a p-value of 5%, with an Adjusted R Squared of 33.6%. Inthat is significantly negatively related to ICR threshold, but with a relatively low beta coefficient. Increasing the interest rates on a loan agreement results in lowering the covenant threshold on the corresponding variable, as predicted. Furthermore, DTNWComp is significantly related to ICR threshold at the 5% level, with a beta coefficient between 0 and 1, as hypothesized.

CovNum (Table 4.2.5.5d), Interest (Table 4.2.5.5e) and CR threshold (Table 4.2.5.5f) show no material support for any of the hypotheses in this research.

4.2.5.6. Debt to Tangible Net Worth Ratio Financial Covenant – Francis Model

The descriptives for DTNW covenant threshold analysis through the Francis model see two changes (4.2.5.6a). The volatility of accruals is measured by the variable σTCA, and the quality of accruals of borrowers is measured by AQFrancis. The mean AQ in the sample is 41.9%, with a lowest AQ of 0, and a highest AQ of 98.3% among borrowers. A total of 75% of the firms that acquire loans have an accrual quality level of 77.1% or below.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

DTNW threshold (CovThres) as a dependent variable is displayed in Table 4.2.5.6b. The regression is significant at the 1% level, with an Adjusted R Squared of 44.8%, and homoscedastic error terms. DTNWComp is consistently positively related to CovThres, with hypothesized beta coefficient levels. Accrual Quality (AQMcNichols) is positively related to CovThres as the 1% level, with a beta coefficient of 7.1. Increasing AQ of borrower firms leads

to less stringent thresholds. Similarly, DTNAAQ is also significantly positively related to CovThres at the 1% level, as hypothesized.

ICR threshold is presented in Table 4.2.5.6c. The regression is significant at the 1% level, with an Adjusted R Squared of 51.3%. Like the McNichols model, Inthat and DTNWComp are significantly related to ICR at the 5% p-value level, as hypothesized. Furthermore, we see that CRhat is positively related to ICR at the 1% level, suggesting that CR threshold acts as a complement to the ICR threshold. DTNWhat is negatively related to ICR threshold, which means that a relaxation of the DTNW threshold leads to a relaxation of the ICR threshold as well. DTNWhat behaves as a complement to ICR threshold.

CovNum (Table 4.2.5.6d), Interest (Table 4.2.5.6e) and CR threshold (Table 4.2.5.6f) are either insignificant, or show no hypothesized relationships predicted by this research.

4.2.5.7. Debt to Tangible Net Worth Ratio Financial Covenant – Summary

The McNichols model performs better than the rest of the accrual models, for DTNW financial covenant analysis. Key findings and conclusions are listed below:

Summary of the Main Findings
• The sample consists of firms that only acquired loans with the DTNW covenant during periods with no recession. This is not by research design, but by lender-borrower behaviour.
• Covenant threshold and a secondary covenant in the form of Interest Coverage Ratio covenant are the analyses considered by lenders. Interest and Covenant Numbers are not taken into account directly.
• Accrual Quality, interaction variable DTNAAQ, volatility of accruals and cash flows, and financial variable i.e. debt to tangible net worth of borrowing firms at loan inception, show hypothesized results and relationships to the DTNW covenant threshold.

• The fact that lenders do not use the DTNW financial covenant during periods of recession suggests that it adds little value to borrower evaluation by lenders, during such time periods. There may be *perceived* risk in using the covenant during downturns. Accurate quantification of Intangible Assets is important to Debt to Tangible Net Worth covenant. Garanasvili (2019) analyses the 2008 recession and finds that different Intangible assets have differing effects on the market value of firms. Investments in R&D increase market value after the recession than before it, whereas patent quantity has no influence on market value after the recession. If lenders are not confident of measuring Intangible Assets correctly in downturns, then the signal from a derivative[55] of the variable will be less useful. Another way to look at it is, if Net Assets cannot be calculated accurately, Return on Assets is noisy, which is an important tool for evaluating the financial health of a company.

4.2.6. Quick Ratio Financial Covenant

The Quick Ratio (QR) financial covenant is set by lenders in the minima. That means borrowers need to maintain a mutually agreed level of minimum cash and cash equivalents to not breach the threshold. Quick Ratio covenant is relaxed by decreasing the threshold and made stringent by increasing it.

There are no secondary covenants in the 2SLS analysis of QR covenant sample. Hence, the evaluations will be for the Covenant Threshold, Interest Rates, and Number of Covenants.

4.2.6.1. Quick Ratio Financial Covenant – Jones Model

Descriptive analysis for the Quick Ratio covenant sample, evaluated through the Jones model, is presented in Table 4.2.6.1a. There are a total of 39 loan deals, with none of the variables having missing values. The Quick Ratio covenant threshold (CovThres) has a mean of 1.067, with a minimum threshold set by lenders being 0.5, and the maximum being 2. 75% of the loans have a QR covenant of 1.25 or less set by lenders. QRComp, which is the financial variable of borrowing firms at the time of loan inception, has mean of 2.02. This means that borrowers are maintaining twice the levels of QR expected by lenders, on average. The

[55] Debt to Tangible Net Worth Ratio financial covenant.

minimum QR of borrowing firms is 0.67, while the maximum QR is 4.885. ϭCFO and ϭTA represent the volatility of cash flows, and the volatility of accruals, respectively. Accrual Quality of borrowing firms is measured through the AQJones variable. The average AQ in the sample is 21.8%, with the highest being 84.2%. 75% of the borrowers have an AQ of 42.1% or lower. QRAAQ is the interaction variable for the financial variable, accrual levels, and accrual quality. The average loan amount borrowed (LAmount) is $393,126, with the lowest loan obtained amounting to $51,756 and the highest being $1.375 Million. The mean operating cycle (OpCycle) for borrowing firms is 179 days. The lowest OpCycle is 35 days. FirmSize represents the size of borrowing firms, measured by the log of total assets. The average FirmSize is 5, with the smallest firm having a value of 2.8 and the largest firm having a value of 8.01. Borrowing firms that have the Quick Ratio covenant written into their loan agreements are not highly leveraged, as the mean leverage in the sample is 39.8%. The market to book value, represented by the Growth variable, has an average value of 3.4. With 50% of the firms at or below the value of 2.1, the rest of the sample firms might be marginally overvalued. Lenders charge the highest levels of interest rates among all the covenants studied in this research, on loans with the Quick Ratio covenant. The spread over base is 2.78% on average, with a minimum of 2% and a maximum spread of 5% charged from borrowers. There are nearly 3 covenants per loan deal in the sample, with a minimum of 1, and a maximum of 6 covenants written into the agreements.

Table 4.2.6.1b shows the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality of the data. FirmSize is normally distributed, while the rest of the variable do not display a normal distribution. The tests performed in this research do not assume normality.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The Quick Ratio covenant threshold (CovThres) as a dependent variable is displayed in Table 4.2.6.1c. The regression is significant at the 1% level, with an Adjusted R Squared of 49.3%. The Breusch-Pagan test statistic of 86.1% means that there is no heteroscedasticity, and the error terms are homoscedastic. QRComp is significantly positively related to CovThres at the 1% p-value level. The beta coefficient is between 0 and 1, as hypothesized (H:5). This means that lenders take into account the prevailing variable value for the borrowers at the time of loan inception. Higher levels of QRComp lead to tighter Quick Ratio covenant threshold.

CovNum as a dependent variable is presented in Table 4.2.6.1d. The regression is significant at the 5% level, with an Adjusted R Squared of 26.6%. Accrual quality (AQJones) is seen to be significantly negatively related to CovNum at the 5% level. Lenders take into account the quality of accruals of borrowers while writing loan agreements; higher accrual quality leads to better credit terms for borrowers in the form of lesser number of covenants in the loan deal.

Interest analysis as a dependent variable is insignificant (Table 4.2.6.1e).

4.2.6.2. Quick Ratio Financial Covenant – Modified Jones Model

There is one change in the descriptives for the Modified Jones model, and that is for the measurement of accrual quality through the variable AQModJones (Table 4.2.6.2a). The mean AQ in the sample is 19%, with a low of 0 and a high of 84.3%. Three fourths of the sample firms have an accrual quality of 37.4% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The results are similar to the Jones Model.

CovThres as a dependent variable is shown in Table 4.2.6.2b. The regression is significant at the 1% level, with an Adjusted R Squared of 44.4%, and homoscedastic error terms. Like the Jones Model, QRComp is significantly positively related to CovThres for the Modified Jones model results. The rest of the independent variables are insignificant.

CovNum is presented in Table 4.2.6.2c. The regression is significant at 5% p-value level, and has an Adjusted R Squared of 23.8%. AQModJones is significantly negatively related to CoNum at the 5% level. Increasing AQ leading to reduced financial covenants in loan deals for borrowers.

Interest variable's analysis is insignificant (Table 4.2.6.2d).

4.2.6.3. Quick Ratio Financial Covenant – Peasnell Model

There are two changes to the variables in the descriptives (Table 4.2.6.3a). ϭWCA measures the volatility of accruals, and the AQPeasnell variable is used to measure accrual quality. The average AQ for the sample through the Peasnell model is 38.1%, with a low of 0 and a high of 96.2%. Three fourths of the borrowing firms have an AQ of 61% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

The Peasnell model performs better than the Jones and Modified Jones models.

Quick Ratio financial covenant (CovThres) as a dependent variable is seen in Table 4.2.6.3b. The regression is significant at the 1% level, with and Adjusted R Squared of 46%. There is no heteroskedasticity among the error terms. Consistent with previous results, QRComp is significantly positively related to CovThres, with a beta coefficient between 0 and 1 as hypothesized.

Interest variable analysis is shown in Table 4.2.6.3c. The regression is significant at the 5% level, with an Adjusted R Squared of 24.1%. The volatility of accruals variable ϬWCA, is highly significant with a p-value of 5% and a beta coefficient of 1205. As predicted, it is positively related to Interest. This means that as the volatility of accruals increases, lenders compensate for the increased exposure to borrower riskiness by increasing the Interest charged on loans. Furthermore, AQPeasnell shows the hypothesized negative relation to Interest, with a high coefficient of -231. As the accrual quality increases, lesser interest rates are charged. Accrual quality of borrowers is considered by lenders while setting Interest rate levels.

CovNum as a dependent variable is presented in Table 4.2.6.3d. The regression is significant at the 1% level, with an Adjusted R Squared of 60.4%. QRComp is significantly positively related to CovNum, as predicted. Interestingly, volatility of Cash Flows (ϬCFO) are positively linked to CovNum as well. This means that as the cash flow levels fluctuate, lenders increase the oversight of the borrowing firm by increasing the number of covenants in the loan deal. Higher volatility in the cash flow component, lead to additional covenants by lenders.

4.2.6.4. Quick Ratio Financial Covenant – Dechow and Dichev (DD) Model

Two changes are made in the descriptives for the DD model analysis (Table 4.2.6.4a). The volatility of accruals is measured through the variable ϬWC, and the quality of accruals is measured through the variable AQDD. The average accrual quality for the borrower firms is 28.4%, with a low of 0 and a high of 98.4%. A total of 75% of the borrowers have an AQ of 55.5% or less.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.2.6.4b shows CovThres as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 38.2%. The Breusch-Pagan test statistic of 65.2% confirms homoscedastic error terms. Consistent with all the models so far, QRComp is significantly positively related to CovThres at the 1% level. Rest of the variables portray immaterial relationships.

Interest is significant at the 5% level, with an Adjusted R Squared of 28.2% (Table 4.2.6.4c). Though none of the independent variables aid the hypotheses and findings of this research.

CovNum is presented in Table 4.2.6.4d. The regression is significant at the 5% level, with an Adjusted R Squared of 23%. Only QRComp shows hypothesized results, with a positive relationship to CovNum at the 5% level. Increasing levels of cash and cash equivalents lead to lenders increasing the monitoring of borrower firms through additional covenants. The rest of the independent variables show insignificant or non-hypothesized results.

4.2.6.5. Quick Ratio Financial Covenant – McNichols Model

One change is made to the descriptives for the McNichols model analysis of Quick Ratio financial covenants (4.2.6.5a). The quality of accruals of borrowing firms are measured by the variable AQMcNichols. The mean AQ for the sample is 56.7%. The lowest accrual quality of borrowing firms is 0, while the highest is 100%. Three fourths of the sample firms have accrual quality of 83.8% or less.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

CovThres is presented in Table 4.2.6.5b. The regression is significant at the 1% level, with an Adjusted R Squared of 47.7%. There is no heteroscedasticity among the error terms. QRComp is significantly positively related to CovThres, as has been observed throughout the models for QR threshold.

Interest is significant at the 5% level, with an Adjusted R Squared of 26.5%, but the independent variables of concern to this research do not display hypothesized results (Table 4.2.6.5c).

CovNum analysis as a dependent variable, is insignificant (Table 4.2.6.5d).

4.2.6.6. Quick Ratio Financial Covenant – Francis Model

There are two changes to the descriptive analysis of QR threshold sample through the Francis model (Table 4.2.6.6a). ϬTCA measures the volatility of accruals, and AQFrancis measures accrual quality. The mean AQ for borrower firms is 41%, with the lowest accrual quality being 0 and the highest being 98.3%. 75% of the borrowers have an AQ of 72.4% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Quick Ratio financial covenant threshold (CovThres) is presented in Table 4.2.6.6b. The regression is significant at the 1% level, with an Adjusted R Squared of 43.3% and homoscedastic error terms. Consistent throughout the QR covenant's analysis, QRComp is significantly positively related to CovThres at the 5% level, with a beta value between 0 and 1. The finding supports Hypothesis 5.

Interest is significant at the 1% level, with an Adjusted R Squared of 34.4% (Table 4.2.6.6c). But like the McNichols model results for Interest, none of the independent variables show hypothesized or material results.

Table 4.2.6.6d shows the CovNum dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 57.5%. Interestingly, QRhat, QRComp, ϬCFO and AQFrancis all show significant, hypothesized results. QRhat is negatively related to CovNum at the 5% leve. This means that as the threshold of QRhat covenant gets tightened, lenders reduce the number of covenants in the loan deal (H:12). Increases in the QRComp and volatility of cash flows (ϬCFO) leads to additional lender oversight (H:5). AQFrancis is negatively related to CovNum, which means that if lenders evaluate the quality of borrower accruals favourably, then borrowers get fewer financial covenants in the loan agreements (H:9).

4.2.6.7. Quick Ratio Financial Covenant – Summary

The best performing models for QR financial covenant are the Peasnell model and the Francis model. Important results from the analyses are summarized below:

Summary of the Main Findings
• The financial variable of borrowers at loan inception is important lender's evaluation of borrower firms' financial health.
• Accrual Levels are not considered a reliable signal for setting the QR covenant threshold, as none of the models show a significant hypothesized result for QRAAQ.
• Lenders take accrual quality, and volatility of accruals into account while setting Interest Rates.
• Lenders take accrual quality, and volatility of cash flows from operations into account while determining the Number of Covenants needed in a loan deal.
• Lenders evaluate accrual quality to determine the initial financial covenant threshold.

4.3. Current Evaluation Trends – 2006 to 2015

During the 1995-2005 period, the six most used financial covenants in loan deals are the Current Ratio covenant, the Quick Ratio covenant, the Interest Coverage Ratio covenant, the Leverage Ratio covenant, the Debt to EBITDA Ratio covenant, and the Debt to Tangible Net Worth Ratio covenant. The covenants during this period are a mix of balance sheet based, and income statement based ratios. It is imperative from this research's point of view to study the 1995-2005 period because the gaps identified in the literature, the misspecification of models and variables, and the discovery of novel lender evaluation techniques, needed a period of comparability. But do the novel variables, hypotheses and evaluation techniques hold true for the post 2005 period? This section aims to address that question, and further support the contributions from this research.

Demerjian (2011) argues that the use of balance sheet based variables has declined over the years, while the use of income statement based variables has remained constant in loan instruments. Ball et al (2015) come to a similar conclusion in their study. There are numerous reasons for the decline of balance sheet based variables, with the most important ones being a

switch to IFRS accounting standards, and greater emphasis on fair value accounting. This research evaluates loan deals during the 2006-2015 period and finds similar results, but with a qualification. The drawback in Demerjian's (2011) finding is that persistence of the same set of variables is checked for, over a period of time. It is entirely possible that a variable once considered as an important signal by lenders, gets replaced by a newer, more robust variable, from the same general balance sheet/income statement group. For example, in the 1995-2005 DEbitda financial covenant sample, nearly 32% of the loan deals have a balance sheet based financial covenant as well. None of those balance sheet based covenants are present in the 2006-2015 DEbitda financial covenant sample, but nearly 40% of the loans have a different balance sheet based covenant[56]. So, the persistence of balance sheet based covenants has declined over time, but newer derivatives of the financial variables are made use of, post 2005. What else, if anything, has changed post 2005? The discussion and results follow.

There are a total of 43,595 loan deals during the 2006-2015 time period. All these loans are checked for detailed information related to loan design and of interest to this research specifically, which brings down the sample to 7,535 loan deals. Applying the same criteria from the Data Collection section of this research, with the added condition of the loan deal containing a Debt to EBITDA covenant[57], a final sample of 60 loan deals is obtained[58].

4.3.1. Debt to EBITDA Ratio Financial Covenant – Jones Model (2006-2015)

Table 4.3.1a shows the descriptives for the DEbitda financial covenant, analysed through the Jones Model. The average covenant threshold (CovThres) set by lenders is a maximum Debt to EBITDA of 3.315. The lowest threshold set is 1.250, while the highest threshold is 6.5. 75% of the borrowers get a maximum covenant threshold of 4 or less. The borrower's average financial variable (DEbitdaComp) at the time of loan inception is 4.9, which means that there are some borrowers who are already in technical default at the time the loan agreement is finalized. AQJones measures the accrual quality of borrowers, with the mean AQ being 25.2%.

[56] For example, the Quick Ratio financial covenant gets replaced by borrowers needing to maintain an absolute value of dollar amounts, for liquidity.
[57] For comparability purposes.
[58] It is observed that for these 60 agreements with earnings based financial covenant, there are a total of 26 instances of the agreements also containing a balance sheet based financial covenant.

The lowest AQ is 0, while the highest AQ among borrowing firms is 92.6%. The average loan amount obtained during the 2006-2015 period is $617,652, with the lowest amount being $12,599 and the highest loan amount being $3.747 Million. The mean operating cycle (Opcycle) of firms in the sample is 118 days. Borrower firms are leveraged to 47.9% on average, with the average Growth variable being a healthy 1.8. A total of 13 loan deals are obtained during a period of recession. Lenders charge an average of 1.96% interest rates over and above the base rate, with 75% of the borrowers getting a spread of 2% or lower. There are nearly 2 covenants per loan deal in the sample, with a minimum of 1 and maximum of 4 covenants per loan agreement.

Table 4.3.1b shows the tests for normality of the data. Kolmogorov-Smirnov and Shapiro-Wilk measures are used to evaluate normality. While the CovThres and FirmSize variables show a degree of normally distributed data, the rest of the variable are not normally distributed. The tests performed in this research do not assume normality of the data.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

CovThres as a dependent variable is shown in Table 4.3.1c. The regression is significant at the 5% level, with an Adjusted R Squared of 17.5%. The Breusch-Pagan test statistic of 30.7% confirms homoscedastic error terms. Interestingly, none of the variables show hypothesized results. This would suggest that lenders do not set the covenant threshold by considering the independent variables set.

Interest as a dependent variable is presented in Table 4.3.1d. The puzzling finding from the CovThres regression, can be addressed here. The Interest regression is significant at the 1% level, with an Adjusted R Squared of 53%, and some very important findings.

Even though the covenant threshold variable is not considered directly, it seems that lenders take the variable into consideration indirectly. DEbitdahat is negatively related to Interest[59], with a beta coefficient of -130. This means that as the DEbitda threshold is tightened by lenders, the interest rates go up, thereby making DEbitdahat a proxy for Interest. This relationship is unexpected and will need to be seen to be replicated in the other models for a definitive conclusion on DEbitdahat's proxy behaviour.

[59] As the relationship is not one that is hypothesized, it is insignificant on a one-tailed hypothesis. The relationship would be significant, if the hypothesis predicted it to be a proxy for Interest.

CovNumhat is significantly negatively related to Interest at the 1% level with a high beta coefficient of -137.6, supporting Hypothesis 7. This means that as the number of covenants in a loan deal increase, lenders reduce the Interest rates charged. DEbitdaComp is significantly positively related to Interest at the 1% level, with a beta coefficient between 0 and 1, supporting Hypothesis 5. As the financial variable of borrowing firms increases, making them more exposed to risk, lenders increase the Interest rates charged. The volatility of accruals ϬTA is positively linked to Interest, as predicted, which means that as accruals fluctuate, lenders charge higher Interest rates from borrowers. Accruals Quality (AQJones) is also highly significant at the 1% level with a negative relation to Interest and a beta coefficient of -220. As the accrual quality of borrowers rises, lenders give favourable credit terms in the form of reduced interest rates. The control variables, OpCycle, FirmSize and Leverage, although of lesser importance to this research, also portray significant relationships to Interest.

CovNum as a dependent variable is shown in Table 4.3.1e. The regression is insignificant.

4.3.2. Debt to EBITDA Ratio Financial Covenant – Modified Jones Model (2006-2015)

There is one change to the descriptives for the Modified Jones model analysis (Table 4.3.2a). AQModJones measures the accrual quality of borrowers in the sample. The average AQ for borrowing firms is 25.6%, with the lowest AQ being 0 and the highest being 93.2%. 75% of the sample firms have an accrual quality of 46.3% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.3.2b shows the DEbitda covenant threshold (CovThres) dependent variable. The regression is significant at the 5% level, with an Adjusted R Squared of 16.3%, and homoscedastic error terms. The independent variables in the regression show no statistical significance.

Interest as a dependent variable is displayed in Table 4.3.2c. The regression is significant at the 1% level, with an Adjusted R Squared of 52%. Consistent with the Jones model findings, DEbitdahat is highly significant at the 1% level, with a positive relationship to Interest. The result supports the notion of DEbitdahat acting as a proxy for Interest. CovNumhat and AQModJOnes are negatively linked to Interest at the 1% level, with beta coefficients of -156 and -187 respectively. DEbitdaComp and ϬTA are positively related to Interest at the 1% level,

with hypothesized results. Though an uncharacteristic beta coefficient of more than 1 on DEbitdaComp weakens the findings related to the variable.

CovNum as a dependent variable is shown in Table 5.3.24. The regression is insignificant.

4.3.3. Debt to EBITDA Ratio Financial Covenant – Peasnell Model

There are two changes to the descriptives for the Peasnell Model (Table 4.3.3a). ϭWCA measures the volatility of accruals, and AQPeasnell measures the quality of accruals of the sample firms. The average AQ of borrowers is 27%, with the lowest being 0, and the highest AQ being 97.1%. Three fourths of the borrowing firms have an AQ of 57% or lower.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.3.3b shows the CovThres dependent variable. The regression is insignificant at the 1% and 5% p-value levels.

Table 4.3.3c shows the Interest dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 48.3%. Consistent with the findings so far, DEbitdahat is negatively related to Interest at the 1% level. CovNumhat and DEbitdaComp show highly significant hypothesized relationships. Furthermore, the interaction variable DEAAQ is negatively related to Interest with a beta coefficient of -121, as hypothesized. This means that lenders take into account the financial variable of the borrower firm, the accrual levels, *and* the quality of the accruals in conjunction with each other, before setting Interest rate levels. The higher the evaluation of the DEAAQ variable, the more stable and persistent the accruals of the borrowers, and hence lower interest rates being charged.

CovNum as a dependent variable is shown in Table 4.3.3d. The regression is insignificant.

5.3.4. Debt to EBITDA Ratio Financial Covenant – Dechow and Dichev (DD) Model (2006-2015)

Two changes are made to the descriptive analysis of the DEbida financial covenant, for the DD model (Table 4.3.4a). ϬWC measures the volatility of working capital accruals, and AQDD measures the quality of the borrower firm's accruals. The average accrual quality for borrowers in the sample is 24.6%, with the lowest AQ being 0 and the highest AQ being 91.9%. 75% of the borrowing firms have accrual quality of 41.6% or less.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.3.4b shows the CovThres dependent variable. The regression is insignificant at the 1% and 5% p-value levels.

Interest as a dependent variable is presented in Table 4.3.4c. The regression is significant at the 1% level, with an Adjusted R Squared of 33.3%. DEbitdahat is negatively related to Interest at the 1% level, suggesting that a relaxation in the DEbitdahat threshold leads to a corresponding lowering of the Interest rates charged by lenders. CovNumhat, DEbitdaComp, volatility of accruals ϬWC, and the interaction variable DEAAQ all show highly significant, hypothesized relationships to the Interest variable.

CovNum as a dependent variable is shown in Table 4.3.4d. The regression is insignificant at the 1% and 5% p-value levels.

5.3.5. Debt to EBITDA Ratio Financial Covenant – McNichols Model (2006-2015)

There is one change in the descriptives for the McNichols model (Table 4.3.5a). AQMcNichols measures the quality of accruals of borrowers. The mean AQ is 50.5%, with the lowest AQ in a borrowing firm being 0, and the highest being 100%. Three fourths of the sample firms have an AQ of 89.3% or less.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.3.5b shows the CovThres dependent variable. The regression is significant at the 5% level, with an Adjusted R Squared of 14.20%. A Breusch-Pagan test statistic of 60.80% confirms that the error terms are homoscedastic. Independent variables of interest to this research are not significant, and do not display hypothesized results.

Table 4.3.5c shows Interest as a dependent variable. The regression is significant at the 1% level, with an Adjusted R Squared of 40.5%. Consistent with all the previous results so far, DEbitdahat is negatively related to Interest at the 1% level, with a beta coefficient of -179. CovNumhat, DEbitdaComp, volatility of accruals ϬWC, and quality of accruals AQMcNichols, all show highly significant hypothesized relationships.

CovNum as a dependent variable is shown in Table 4.3.5d. The regression is insignificant at the 1% and 5% p-value levels.

5.3.6. Debt to EBITDA Ratio Financial Covenant – Francis Model (2006-2015)

Two changes are made to the descriptives for the Francis Model (Table 5.3.6a). ϬTCA measures the volatility of accruals, and the quality of borrower accruals is measured by AQFrancis. The mean AQ is 45.6%, with the lowest AQ in a borrowing firm being 0, and the highest being 98.1%. 75% of the sample firms have an AQ of 77.3% or less.

Stage 2 of Two Stage Least Squares – Discussions in Light of Hypotheses

Table 4.3.6b shows the CovThres dependent variable. The regression is insignificant at the 1% and 5% p-value levels.

Interest as a dependent variable is seen in Table 4.3.6c. The regression is significant at the 1% level, with an Adjusted R Squared of 49.8%. DEbitdahat is negatively related to Interest at the 1% level, with a beta coefficient of -140. CovNumhat, DEbitdaComp, volatility of accruals ϬTCA, and interaction variable DEEAQ are all highly significant, with their hypothesized signs. A marginally higher beta coefficient on the DEbitdaComp, than hypothesized, means that the support for Hypothesis 5 is weak in the Francis model.

CovNum as a dependent variable is shown in Table 4.3.6d. The regression is at the 5% level, with an Adjusted R Squared of 14.7%. The independent variables of interest to this research are either not significant, or do not display hypothesized results.

4.3.7. Debt to EBITDA Ratio Financial Covenant (2006-2015) – Summary

All models perform consistently similar to each other, in the post 2005 sample of the Debt to EBITDA ratio financial covenant. Important conclusions and results are listed below:

Summary of the Main Findings
• Covenant Threshold and Number of Covenants regressions are insignificant, or without hypothesized results throughout the analysis period. Both variables are considered by lenders indirectly.
• Emphasis on the Interest rates charged, in loan deals. The hypothesized results for this research are highly supported.
• Evidence is provided for the first time of the primary financial covenant's threshold (DEbitdahat) behaving as a proxy to Interest rates. The negative relationship was observed in the 1995-2005 sample for DEbitda ratio as well, but none of those results were significant. In the 2006-2015 sample period, it is highly significant across all 6 models, with high beta coefficients.
• Lenders consider the quality of accruals, the number of covenants, the financial variable, the levels of accruals and their volatility for borrower firms, before settling on the levels of Interest rates to be charged on loans.
• Covenant thresholds, Interest Rates and Number of Covenants in a loan deal are endogenous.
• Evidence is presented that implies the nature of some Balance Sheet based financial ratio covenants changes according to the needs of the lenders, and the kind of information they want the covenants to signal.

5. Conclusion & Future Areas of Research

The inherent flexibilities in GAAP allow firms to exercise accounting discretion, while reporting on the financial health of the companies. Managers may use techniques that do not present the true financial position of the firm. Borrowers can use strong company financials and firm fundamentals to bargain for better credit terms from lenders. Lenders use financial reporting to be able to gauge the volatility of future cash flows of a borrower. Aware of the adverse selection problem, where the borrowers have more information than the lenders, lending organizations tend to write binding agreements called loan covenants, into the agreements. These covenants help secure the interests of the lenders, and act as early warning mechanisms for impending financial trouble or technical default. Christensen and Nikolaev (2012) show that financial covenants written into loan deals, bring the interests of the lenders and borrowers closer, and diminishes the agency problem of adverse selection.

Positive Accounting Theory's Debt Covenant Hypothesis sheds light on the opportunistic behaviour of managers. Studies[60] show that managers will engage in earnings manipulation for personal gains, avoiding regulations, and staving off the breach of financial covenants. Earnings are found to be the favoured variable for this purpose, as the accrual component of earnings can be manipulated rather easily and discreetly. Lenders are expected to evaluate the accrual component of borrowing firms' earnings, to get a clearer picture of the financial health of the firm, and for them to be able to set accurate initial levels of debt covenants. Debt covenants are akin to options held by the lenders, with exercise "prices" equal to the covenant thresholds specified in the loan instruments. If there are multiple covenants in the same loan agreement, the options are not independent. They share some similarities with an 'add up basket credit default swap', which pays off when any one of a number of reference events occur. When a covenant breach takes place, the lenders, to secure their positions add negative covenants to the renegotiated loan instruments. These additional covenants are primarily related to oversight on the borrower's investment activities and further financing (Beneish and Press, 1993). Christensen and Nikolaev (2012) discuss the use of capital covenants, which directly affect the use of balance sheet values and limits the amount of debt, is negatively correlated with the use of performance covenants, which pertain to current efficiency and

[60] Healy (1985), Jones (1991), DeFond and Jiambalvo (1994), Dechow et al. (1995), Bernard and Skinner (1996), Peasnell et al. (2000), Dichev and Skinner (2002), Janes (2003), Islam et al. (2011), Fung and Goodwin (2013), Jha (2013), Darjezi (2016).

profitability indicators. Performance covenants are used only when the accounting variables are good signals of credit quality. When the quality of a signal declines, the prediction is that covenant threshold or slack will increase. In the limit, as the signal becomes completely uninformative, covenant threshold or slack becomes infinite, which is tantamount to saying the signal will be discarded. Financial variables have a high value for lenders, if they signal a high net benefit resulting from intervention. Covenant Slack is known as the difference between the level the covenant threshold is set at, and actual value of the financial variable of the firm. As shown through careful consideration of the theory in the earlier chapters, and proofs through examples as well as robustness tests later, it is observed that Covenant Threshold is a superior measure when conducting Accrual Quality studies. The foremost reason being that, in lender-focused research it would create a bias if the variables being monitored were not under the decision set of the lender, rather under those of the borrower (here, financial variable of the firm).

From a stakeholder point of view, predicting future cash flows is a crucial step for decision making. Accruals are a strong indicative element of *future* cash flows. Dechow (1994) argues that the analysis of earnings to measure the financial stability of a firm, yields far superior results compared to that of the underlying cash flows. Earnings and Accruals related studies have in the past used proxies such as debt structure and accrual levels, to evaluate the quality of earnings and accruals. This research analyzes lender's evaluation of borrowing firms' financials, considering a specific Accrual Quality metric, which is the adjusted R Squared of the firm specific regressions in a time series analysis of 8 years, while designing loan contracts.

Six financial covenants, namely Leverage Ratio covenant, Interest Coverage Ratio covneant, Current Ratio covenant, Quick Ratio covenant, Leverage Ratio Covenant, Debt to EBITDA Ratio covenant, and Debt to Tangible Net Worth Ratio covenant are studied. The time periods are divided into two halves, for comparability with present literature, data availability considerations, and current evaluation trends. These time periods are 1995-2005, and 2006-2015.

During the 1995-2005 period, for the leverage ratio covenant it is seen that Covenant Threshold is a superior measure to Covenant Slack metric, and as proposed by this research, the slack variable is mis specified. Leverage Ratio covenant is set after taking the Accrual Quality of

borrowers into account, where strong accruals quality leads to a lenient threshold on the covenant. While we see that Interest has no direct effect on the determination of threshold for this covenant, lenders compensate for it through increased Number of Covenants in the loan deal. Lenders also take the volatility of accrual levels into account, but accrual quality provides incremental information over and above accrual magnitude. Multiple covenants in a loan deal are seen to behave as complements and substitutes throughout the analyses, and in Leverage Ratio covenant's case Interest Coverage Ratio covenant is complementary in nature. The Interaction Variable[61] is significant in 4 out of 6 equations, which means lenders also consider the magnitude of accruals for setting Leverage Ratio thresholds. For the Current Ratio financial covenant, we find that in addition to threshold setting, Interest Rates are also determined after the Accrual Quality is determined by the lenders. But unlike the Leverage Ratio covenant's finding, Interest has a direct effect on the covenant threshold of Current Ratio. The interaction variable for Current Ratio is insignificant in the threshold regressions, meaning lenders do not take accrual levels into account while setting Current Ratio thresholds. Apart from confirming the significance of Accrual Quality, Covenant Threshold's superiority over Covenant Slack, and multiple covenants acting as complements and substitutes, we find that the Interest Coverage Ratio covenant also supports lenders taking Accrual Quality into account while setting the Number of Covenants in a loan deal. Higher number of covenants mean lenders have evaluated borrower accruals as of poor quality. Findings from the Bradley and Roberts (2004) study are supported in the analyses of the Debt to EBITDA ratio covenant, where we observe that Firm Size is a proxy for Number of Covenants in a loan deal, and that the two variables are negatively linked. Volatility of Accruals are also taken into consideration, which helps to gauge the risk of default of the borrowing firm, while writing loan agreements containing the Debt to EBITDA covenant as a primary variable. For the Debt to Tangible Net Worth ratio covenant, apart from the Accrual Quality, Threshold and Interaction Variable hypothesis confirmations, it is observed that this covenant only features in periods of no recession, in our sample. As discussed earlier, this may be due to inaccurate estimations of Intangible Assets during periods of recession[62]. For the Quick Ratio covenant, lenders take the Accrual Quality and Volatility of Accruals into account while designing the loan's Interest Rate and focus on the Quality of Accruals and Volatility of Cash Flows while determining the

[61] LRAAQ - It takes the correlation between the financial variable and accrual levels and merges it with the accrual quality of a borrower. This helps to incorporate the varied effects different financial variables have on accrual levels, and then gauges their quality.
[62] See for example Garanasvili (2019).

Number of Covenants to be implemented. The Interaction Variable is not significant for the Quick Ratio covenant, as Accrual Levels are not considered to be a reliable signal by lenders for this covenant. *Briefly*, it is observed that the Covenant Threshold metric is a superior and well specified variable for lender-side evaluation of borrower financials. Accruals Quality is an important tool for decision makers and has incremental explanatory power over Accrual Levels. Covenant Threshold is determined in conjunction with Interest Rates and Number of Covenants in a loan deal. If there are multiple covenants in a loan deal, they are either of complementary or substitutionary nature. For the 2006-2015, the Debt to EBITDA ratio covenant is analyzed. It is observed that lenders account for Covenant Threshold and Number of Covenants indirectly, through the Interest Rates charged. The covenant is also seen to behave as a proxy to Interest Rates, a relationship which to the best of my knowledge, has not been reported before. The findings are consistent across most of the accrual models for this period. Lenders consider the quality of accruals, the number of covenants, the financial variable, the levels of accruals and their volatility for borrower firms, before settling on the levels of Interest rates to be charged on loans. Evidence is presented that implies the nature of some Balance Sheet based financial ratio covenants changes according to the needs of the lenders, and the kind of information they want the covenants to signal. This finding sheds further light on the results shared by Demerjian (2011) and Ball et al (2015).

Six different models[63] used in the accruals manipulation literature are analyzed. All models have varying degrees of success, with no 'one size fits all' solution to the choice of a specific model. However, it is imperative to mention here that researchers need to be careful in their choice of accrual models, and the data sets they have been derived from. For example, the Jones (1994) model is based on a sample that is obtained from firms operating in the Metals, Automobiles and Footwear industries. If a randomly chosen model is not helpful in the analysis of the financial covenants and their corresponding financial variables, then the results will be weak, and immaterial or insignificant. The characteristics of loan deals samples can depend on the model chosen for analysis. Researchers need to take this into account especially in single model, single covenant related studies. This research identifies the financial covenants and the accrual models that are relevant to their analyses. For the Leverage Ratio covenant, the best performing model was the Peasnell Model. For the Current Ratio covenant, the best performing

[63] Jones Model, Modified Jones Model, Peasnell Model, Dechow and Dichev Model, McNichols Model, Francis Model.

model was the Dechow and Dichev model. For the Interest Coverage Ratio covenant, the Peasnell model outperformed the rest. The Francis and McNichols models perform at par for the Debt to EBITDA Ratio covenant. For the Debt to Tangible Net Worth Ratio covenant, the McNichols model's analysis is superior, and for the Quick Ratio covenant, the Peasnell and Francis models surpass the rest of the models. The Jones and Modified Jones models did not outperform the other models for any financial covenant. This may be because the Jones and Modified Jones models are adjusting for current and long-term non-discretionary accrual components in their models but are devoid of the ability to capture the mean-reversing nature of accruals. That characteristic is captured by the Cash Flows from Operations components in the other models.

The literature is devoid of information on the minima and maxima interpretations of financial covenants. This research not only distinguishes financial covenants based on these metrics, but also explains results obtained in light of these considerations. For example, Accrual Quality having a negative relationship to all minima-based covenants, and a positive relationship with all maxima based financial covenants. These results are observed throughout the research, with the Covenant Threshold measure of lender evaluation lent further credence by the conclusions that the Covenant Slack measure fails to support this distinction. Although Interest and Number of Covenants in loan deals are already established as endogenous variables, it is undocumented whether Covenant Threshold is endogenous as well. This research fills that gap by providing evidence to support the endogeneity of the Covenant Threshold variable, as well as that of Interest Rates and Number of Covenants in loan instruments. No evidence is seen for Interest Rates, Covenant Thresholds and Number of Covenants to support an Industry effect in the determination of these variables, by lenders. Lastly, this research does not exclude borrowers from the sample who are in breach of covenants at the time of loan inception, as has been the practice in the literature. Normal fluctuations in business operations are expected and endured by lenders. They represent risk for borrowers, but not necessarily risk of default.

While numerous gaps in the literature have been identified and addressed by this research, there are still some interesting avenues that can be pursued.

Accrual quality estimation models can potentially benefit from the addition of the management turnover and auditor going concern variables. The main criterion for variables to be added to accrual quality models is their explanatory power regarding 'non-discretionary accrual'

components. Managers understating earnings and auditors calling for conservation in financial reporting may have a significant impact on non-discretionary accruals. These two variables have not been tested in accrual quality estimation models, yet.

Accrual models can be used to gauge the quality of earnings and predict the event of financial distress at firms. One of the criticisms that the Dechow and Dichev model faces is its forward-looking bias, where a firm in year t, needs to have cash flow related information available for time t+1. The probability of distress can be evaluated by a metric such as Altman's Z-Score. The explanatory power, and the criticism the model faces can be researched by analyzing a set of firms that have undergone financial distress, against a control set of firms that do not experience such an event. If the Dechow and Dichev model can significantly predict the event of looming financial distress, it will add further credence to its viability.

Furthermore, studying additional financial covenants and their importance to lenders will enrich our understanding of lender-side evaluation of borrowers, and the components of loan design.

Regression Information for Two Stage Least Squares Analysis – LIST OF TABLES

The following Tables and information are related to Stage 1 and Stage 2 regressions of Two Stage Least Squares.

The first covenant to be analysed is Leverage Ratio Financial Covenant, hence the Descriptive analysis, the Normality tests, Stage-1 and Stage-2 regressions are all presented, labelled, and tabulated.

For reasons of brevity, the financial covenant information that is discussed in Section 5 after the Leverage Ratio covenant analysis, relates to Stage-2 analyses only. Hence the Stage-1 regressions are not labelled, but tabulated.

Below, all the information that is used to reach the conclusions, is presented.

LEVERAGE RATIO FINANCIAL COVENANT – JONES MODEL ANALYSIS

Leverage Ratio - Jones Model - Descriptives - Table 4.2.1.1a

		CovThres	LRComp	ΔCFO	ΔTA	AQJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	243	243	243	243	243	243	243	243	243	243	243	243	243	243
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		0.602	1.819	0.044	0.043	0.234	0.096	576,603	125.241	7.366	0.587	2.228	0.025	195.988	2.15
Median		0.6	1.51	0.04	0.034	0.095	0.023	243,576	99.588	7.393	0.595	1.792	0	200	2
Std. Deviation		0.092	1.425	0.023	0.048	0.275	0.148	3,376,754	202.008	1.531	0.15	2.282	0.156	32.728	0.964
Skewness		0.107	-0.188	1.046	8.422	0.931	2.166	13	13.198	-0.137	-0.148	7.33	6.164	-1.405	0.929
Std. Error of Skewness		0.156	0.156	0.156	0.156	0.156	0.156	0	0.156	0.156	0.156	0.156	0.156	0.156	0.156
Kurtosis		0.792	11.371	1.354	96.563	-0.394	5.3	183	193.478	-0.404	0.079	85.501	36.292	10.016	1.023
Std. Error of Kurtosis		0.311	0.311	0.311	0.311	0.311	0.311	0	0.311	0.311	0.311	0.311	0.311	0.311	0.311
Minimum		0.35	-8.168	0.006	0.006	0	0	17,773	0.713	3.275	0.19	-4.754	0	0	1
Maximum		0.95	7.236	0.137	0.628	0.977	0.834	49,149,338	3089.728	10.971	1.14	29.581	1	300	6
Percentiles	25	0.55	0.931	0.026	0.023	0	0	140,558	70.163	6.197	0.482	1.294	0	200	1
	50	0.6	1.51	0.04	0.034	0.095	0.023	243,576	99.588	7.393	0.595	1.792	0	200	2
	75	0.65	2.424	0.054	0.052	0.427	0.126	364,650	140.257	8.604	0.694	2.737	0	200	3

Leverage Ratio - Tests of Normality - Jones Model - Table 4.2.1.1b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.12	243	0	0.97	243	0
LRComp	0.141	243	0	0.817	243	0
ΔCFO	0.101	243	0	0.938	243	0
ΔTA	0.227	243	0	0.445	243	0
AQJones	0.197	243	0	0.818	243	0
LRAAQ	0.259	243	0	0.699	243	0
LAmount	0.434	243	0	0.089	243	0
OpCycle	0.282	243	0	0.234	243	0
FirmSize	0.046	243	.200*	0.993	243	0.285
Leverage	0.046	243	.200*	0.987	243	0.028
Growth	0.18	243	0	0.543	243	0
Recession	0.538	243	0	0.139	243	0
Interest	0.475	243	0	0.434	243	0
CovNum	0.281	243	0	0.848	243	0

LR - Stage 1 of Two Stage Least Squares – Jones Model

Table 4.2.1.1c

Dependent Variable: CovThres

	LRComp	ΔCFO	ΔTA	AQJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	0.001	1.078	-0.069	-0.07	0.09	0	0	0.008	0.3	-0.003	-0.044	0	0
T Values	0.22	4.206	-0.532	-2.492	1.724	-1.461	-3.173	2.058	6.679	-1.278	-1.442	3.867	1.83
Significance	0.826	0	0.595	0.013	0.086	0.145	0.002	0.041	0	0.203	0.151	0	0.069
VIF	1.968	1.581	1.781	2.761	2.751	1.078	1.097	1.558	2.106	1.162	1.021	1.324	1.062

R-Squared	41.70%
Adjusted R Squared	38.40%
Regression Sig.	0.00%
Breusch-Pagan Test	47.90%

Table 4.2.1.1d

Dependent Variable: Interest

	LRComp	ΔCFO	ΔTA	AQJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	-0.472	37.457	13.75	13.463	-18.718	0	0.002	-3.415	-16.576	-0.281	6.845	0	0
T Values	-0.228	0.324	0.234	1.06	-0.797	-0.606	0.215	-1.995	-0.817	-0.284	0.502	-0.383	-0.57
Significance	0.82	0.746	0.815	0.29	0.426	0.545	0.83	0.047	0.415	0.777	0.616	0.702	0.569
VIF	1.968	1.581	1.781	2.761	2.751	1.078	1.097	1.558	2.106	1.162	1.021	1.324	1.062

R-Squared	5.70%
Adjusted R Squared	0.03%
Regression Sig.	39.10%

Table 4.2.1.1e

Dependent Variable: CovNum

	LRComp	ΔCFO	ΔTA	AQJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	0.127	-0.956	2.162	-0.015	0.739	0	0	-0.342	0.197	-0.036	-0.153	0	0
T Values	2.587	-0.347	1.545	-0.048	1.323	0.327	1.085	-8.398	0.408	-1.525	-0.47	-3.341	2.953
Significance	0.01	0.729	0.124	0.961	0.187	0.744	0.279	0	0.684	0.129	0.639	0.001	0.003
VIF	1.968	1.581	1.781	2.761	2.751	1.078	1.097	1.558	2.106	1.162	1.021	1.324	1.062

R-Squared	38.40%
Adjusted R Squared	34.90%
Regression Sig.	0.00%

Table 4.2.1.1f

Dependent Variable: ICR

	LRComp	ϭCFO	ϭTA	AQJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	-0.06	-2.3	-3.811	0.995	-0.757	0	-0.001	0.083	-2.439	0.285	-0.407
T Values	-0.787	-0.434	-0.819	1.408	-0.585	-1.917	-0.731	0.997	-2.928	4.026	-0.798
Significance	0.434	0.665	0.415	0.163	0.561	0.059	0.467	0.322	0.005	0	0.427
VIF	1.521	1.881	2.169	4.109	4.177	1.178	1.201	1.692	2.017	1.404	1.061

R-Squared	45.50%
Adjusted R-Squared	37.50%
Regression Sig.	0.00%

LR -Stage 2 of Two Stage Least Squares – Jones Model

Dependent Variable CovThres

Table 4.2.1.1g

	ICRhat	Inthat	CovNumhat	LRComp	ϭCFO	ϭTA	AQJones	LRAAQ	Lamount	SIC4	SIC5
Beta Values	-0.001	-0.014	0.11	-0.017	1.452	-0.057	0.112	-0.245	0	0	0
T Values	-0.399	-6.815	4.743	-2.465	5.281	-0.417	2.761	-3.05	-4.709	4.282	-3.186
Significance	0.69	0	0	0.014	0	0.677	0.006	0.003	0	0	0.002
VIF	1.105	10.745	8.257	4.273	1.693	1.811	5.307	6.098	1.414	1.663	2.558

R-Squared	36.80%
Adjusted R-Squared	33.80%
Regression Sig.	0.00%
Breusch-Pagan Test	45.00%

Pearson Correlations

	CovThres	ICRhat	Inthat	CovNumhat	LRComp	ϭCFO	ϭTA	AQJones	LRAAQ	Lamount	SIC4	SIC5
CovThres	1.000	-.155	-.396	-.092	.350	.058	.069	-.046	.045	-.152	.182	.082
ICRhat		1.000	.143	-.036	-.163	.016	-.017	.063	.066	-.011	-.132	-.181
Inthat			1.000	.587	-.502	.474	.302	.160	-.051	.050	-.028	-.044
CovNumhat				1.000	.063	.385	.228	.057	.064	.207	-.221	.390
LRComp					1.000	-.153	-.123	-.093	-.095	-.085	.037	.036
ϭCFO						1.000	.422	.051	.037	.070	-.008	.110
ϭTA							1.000	.296	.263	.001	.410	.035
AQJones								1.000	.788	-.049	.108	.002
LRAAQ									1.000	-.035	.078	-.038
Lamount										1.000	-.001	-.026
SIC4											1.000	-.127
SIC5												1.000

Dependent Variable Interest

Table 4.2.1.1h

	ICRhat	LRhat	CovNumhat	LRComp	ϭCFO	ϭTA	AQJones	LRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
Beta Values	2.769	-53.263	8.249	-1.204	105.765	-6.515	8.736	-20.941	0	-0.003	-0.302	0	0
T Values	1.816	-0.831	1.533	-0.519	0.807	-0.108	0.638	-0.821	-0.75	-0.293	-0.273	0.881	-0.486
Significance	0.071	0.407	0.127	0.604	0.42	0.914	0.524	0.412	0.454	0.77	0.785	0.379	0.627
VIF	1.114	3.349	2.376	2.512	2.057	1.894	3.253	3.284	1.16	1.31	1.457	1.645	1.5

R-Squared	7.00%
Adjusted R-Squared	1.70%
Regression Sig.	20.10%

Dependent Variable CovNum

Table 4.2.1.1i

	ICRhat	LRhat	Inthat	LRComp	ϭCFO	ϭTA	AQJones	LRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
Beta Values	0.204	8.447	0.117	0.175	-13.974	0.906	-1.009	2.046	0	0.001	0.016	0	0
T Values	5.962	4.125	8.106	3.825	-3.533	0.682	-3.304	3.58	4.535	2.497	0.613	-3.287	5.726
Significance	0	0	0	0	0	0.496	0.001	0	0	0.013	0.541	0.001	0
VIF	1.114	6.773	5.784	1.947	3.71	1.824	3.208	3.267	1.356	1.433	1.636	1.759	1.119

R-Squared	45.80%
Adjusted R-Squared	42.70%
Regression Sig.	0.00%

Dependent Variable ICR

Table 4.2.1.1j

	LRhat	Inthat	CovNumhat	LRComp	ϭCFO	ϭTA	AQJones	LRAAQ	OpCycle
Beta Values	-8.38	0.053	-1.324	0.269	5.178	2.877	-0.17	2.095	-0.002
T Values	-2.988	1.549	-3.886	2.673	0.727	0.562	-0.187	1.18	-0.953
Significance	0.004	0.126	0	0.009	0.47	0.576	0.852	0.242	0.344
VIF	3.208	6.016	3.275	2.185	2.802	2.162	5.582	6.461	1.275

R-Squared	32.00%
Adjusted R-Squared	24.00%
Regression Sig.	0.00%

LEVERAGE RATIO FINANCIAL COVENANT – MODIFIED JONES MODEL ANALYSIS

Leverage Ratio - Modified Jones Model - Descriptives - Table 4.2.1.2a

		CovThres	LRComp	ΔCFO	ΔTA	AQModJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	243	243	243	243	243	243	243	243	243	243	243	243	243	243
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		0.602	1.819	0.044	0.043	0.221	0.092	576,603	125.241	7.366	0.587	2.228	0.025	195.988	2.148
Median		0.6	1.51	0.04	0.034	0.097	0.017	243,576	99.588	7.393	0.595	1.792	0	200	2
Std. Deviation		0.092	1.425	0.023	0.048	0.272	0.145	3,376,754	202.008	1.531	0.15	2.282	0.156	32.728	0.964
Skewness		0.107	-0.188	1.046	8.422	1.059	2.117	13	13.198	-0.137	-0.148	7.33	6.164	-1.405	0.929
Std. Error of Skewness		0.156	0.156	0.156	0.156	0.156	0.156	0	0.156	0.156	0.156	0.156	0.156	0.156	0.156
Kurtosis		0.792	11.371	1.354	96.563	-0.09	4.802	183	193.478	-0.404	0.079	85.501	36.292	10.016	1.023
Std. Error of Kurtosis		0.311	0.311	0.311	0.311	0.311	0.311	0	0.311	0.311	0.311	0.311	0.311	0.311	0.311
Minimum		0.35	-8.168	0.006	0.006	0	0	17,773	0.713	3.275	0.19	-4.754	0	0	1
Maximum		0.95	7.236	0.137	0.628	0.977	0.829	49,149,338	3089.728	10.971	1.14	29.581	1	300	6
Percentiles	25	0.55	0.931	0.026	0.023	0	0	140,558	70.163	6.197	0.482	1.294	0	200	1
	50	0.6	1.51	0.04	0.034	0.097	0.017	243,576	99.588	7.393	0.595	1.792	0	200	2
	75	0.65	2.424	0.054	0.052	0.377	0.131	364,650	140.257	8.604	0.694	2.737	0	200	3

Leverage Ratio - Tests of Normality - Jones Model - Table 4.2.1.2b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CTlr	0.12	243	0	0.97	243	0
LevRatio1	0.141	243	0	0.817	243	0
StDevCFOSc	0.101	243	0	0.938	243	0
StDevTA	0.227	243	0	0.445	243	0
AQModJones	0.208	243	0	0.8	243	0
LRAAQ	0.263	243	0	0.692	243	0
LAmount	0.434	243	0	0.089	243	0
OpCycle	0.282	243	0	0.234	243	0
FirmSizeInTotAss	0.046	243	0.2	0.993	243	0.285
LeverageLE	0.046	243	0.2	0.987	243	0.028
MBRatio	0.18	243	0	0.543	243	0
Recession	0.538	243	0	0.139	243	0
Interest	0.475	243	0	0.434	243	0
CovNum	0.281	243	0	0.848	243	0

LR - Stage 1 of Two Stage Least Squares - Modified Jones Model

Table 4.2.1.2c

Dependent Variable	CovThres												
	LRComp	ΔCFO	ΔTA	AQModJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	0.001	1.093	-0.067	-0.075	0.097	0	0	0.008	0.304	-0.003	-0.045	0	0
T Values	0.115	4.269	-0.516	-2.595	1.786	-1.414	-3.084	2.049	6.765	-1.287	-1.478	3.877	1.831
Significance	0.909	0	0.606	0.01	0.075	0.159	0.002	0.042	0	0.2	0.141	0	0.068
VIF	1.993	1.581	1.779	2.899	2.887	1.08	1.111	1.555	2.105	1.16	1.024	1.323	1.062

R-Squared	41.90%
Adjusted R Squared	38.60%
Regression Sig.	0.00%
Breusch-Pagan Test	47.80%

Table 4.2.1.2d

Dependent Variable	Interest												
	LRComp	ΔCFO	ΔTA	AQModJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	-0.439	34.079	15.46	14.488	-22.22	0	0.002	-3.369	-16.874	-0.284	6.896	0	0
T Values	-0.211	0.295	0.263	1.102	-0.905	-0.616	0.205	-1.971	-0.832	-0.286	0.505	-0.391	-0.573
Significance	0.833	0.769	0.793	0.271	0.366	0.538	0.838	0.05	0.406	0.775	0.614	0.697	0.567
VIF	1.993	1.581	1.779	2.899	2.887	1.08	1.111	1.555	2.105	1.16	1.024	1.323	1.062

R-Squared	5.70%
Adjusted R Squared	0.04%
Regression Sig.	38.30%

Table 4.2.1.2e

Dependent Variable	CovNum												
	LRComp	ΔCFO	ΔTA	AQModJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	0.133	-0.935	2.108	-0.034	0.852	0	0	-0.343	0.167	-0.037	-0.141	0	0
T Values	2.695	-0.34	1.51	-0.108	1.461	0.248	0.947	-8.439	0.347	-1.561	-0.435	-3.351	2.971
Significance	0.008	0.734	0.133	0.914	0.145	0.805	0.344	0	0.729	0.12	0.664	0.001	0.003
VIF	1.993	1.581	1.779	2.899	2.887	1.08	1.111	1.555	2.105	1.16	1.024	1.323	1.062

R-Squared	38.60%
Adjusted R Squared	35.10%
Regression Sig.	0.00%

Table 4.2.1.2f

Dependent Variable	ICR										
	LRComp	ΔCFO	ΔTA	AQModJones	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession

R-Squared	43.60%

Beta Values	-0.066	-2.93	-1.599	0.311	-0.258	0	-0.001	0.096	-2.7	0.274	-0.524
T Values	-0.822	-0.542	-0.338	0.385	-0.173	-1.988	-0.851	1.127	-3.217	3.81	-1.013
Significance	0.413	0.59	0.736	0.701	0.863	0.05	0.398	0.263	0.002	0	0.314
VIF	1.611	1.893	2.162	4.767	5.039	1.174	1.19	1.69	1.975	1.399	1.053

Adjusted R Squared	35.30%
Regression Sig.	0.00%

LR - Stage 2 of 2SLS - Modified Jones Model

Table 4.2.1.2g

Dependent Variable	CovThres

	ICRhat	Inthat	CovNumhat	LRComp	ϭCFO	ϭTA	AQModJones	LRAAQ	Lamount	SIC4	SIC5
Beta Values	-0.002	-0.014	0.113	-0.019	1.443	-0.02	0.127	-0.314	0	0	0
T Values	-0.528	-7.004	4.899	-2.683	5.32	-0.145	2.979	-3.542	-4.791	4.293	-3.359
Significance	0.598	0	0	0.008	0	0.884	0.003	0	0	0	0.001
VIF	1.103	10.957	8.227	4.379	1.661	1.787	5.793	7.214	1.401	1.654	2.581

R-Squared	37.30%
Adjusted R Squared	34.40%
Regression Sig.	0.00%
Breusch-Pagan Test	45.30%

Pearson Correlations

	CovThres	ICRhat	Inthat	CovNumhat	LRComp	ϭCFO	ϭTA	AQModJones	LRAAQ	Lamount	SIC4	SIC5
CovThres	1.000	-.153	-.397	-.092	.350	.058	.069	-.064	.022	-.152	.182	.082
ICRhat		1.000	.120	-.039	-.163	.016	-.017	-.002	.034	-.011	-.133	-.174
Inthat			1.000	.577	-.500	.473	.301	.174	-.052	.050	-.028	-.043
CovNumhat				1.000	.063	.385	.227	.081	.083	.207	-.220	.389
LRComp					1.000	-.153	-.123	-.144	-.139	-.085	.037	.036
ϭCFO						1.000	.422	.091	.060	.070	-.008	.110
ϭTA							1.000	.311	.273	.001	.410	.035
AQModJones								1.000	.799	-.009	.115	-.006
LRAAQ									1.000	.002	.087	-.047
Lamount										1.000	-.001	-.026
SIC4											1.000	-.127
SIC5												1.000

Table 4.2.1.2h

Dependent Variable	Interest

	ICRhat	LRhat	CovNumhat	LRComp	ϭCFO	ϭTA	AQModJones	LRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
Beta Values	2.961	-51.626	8.236	-1.229	101.793	-6.549	11.499	-26.638	0	-0.003	-0.284	0	0
T Values	1.944	-0.812	1.538	-0.531	0.774	-0.109	0.813	-0.996	-0.726	-0.258	-0.258	0.885	-0.478
Significance	0.053	0.418	0.125	0.596	0.44	0.913	0.417	0.32	0.469	0.797	0.796	0.377	0.633
VIF	1.111	3.315	2.369	2.511	2.074	1.887	3.412	3.483	1.156	1.324	1.456	1.641	1.496

R-Squared	7.20%
Adjusted R Squared	1.90%
Regression Sig.	17.50%

Table 4.2.1.2i

Dependent Variable	CovNum

	ICRhat	LRhat	Inthat	LRComp	ϭCFO	ϭTA	AQModJones	LRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
Beta Values	0.207	8.546	0.12	0.184	-13.866	0.42	-1.004	2.458	0	0.001	0.018	0	0
T Values	6.049	4.207	8.234	4.026	-3.525	0.316	-3.162	4.05	4.588	2.35	0.684	-3.251	5.831
Significance	0	0	0	0	0.001	0.753	0.002	0	0	0.02	0.494	0.001	0
VIF	1.112	6.735	5.953	1.941	3.696	1.841	3.416	3.567	1.349	1.435	1.635	1.747	1.119

R-Squared	46.20%
Adjusted R Squared	43.10%
Regression Sig.	0.00%

Table 4.2.1.2j

Dependent Variable	ICR

	LRhat	Inthat	CovNumhat	LRComp	ϭCFO	ϭTA	AQModJones	LRAAQ	OpCycle
Beta Values	-8.785	0.055	-1.367	0.27	5.218	4.966	-1.178	3.42	-0.002
T Values	-3.094	1.55	-3.912	2.54	0.72	0.951	-1.142	1.647	-1.054
Significance	0.003	0.125	0	0.013	0.474	0.345	0.257	0.104	0.295
VIF	3.089	5.9	3.281	2.339	2.775	2.151	6.349	7.945	1.264

R-Squared	29.00%
Adjusted R Squared	20.60%
Regression Sig.	0.01%

LEVERAGE RATIO FINANCIAL COVENANT – PEASNELL MODEL ANALYSIS

Leverage Ratio - Peasnell Model - Descriptives - Table 4.2.1.3a

		CovThres	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	243	243	243	243	243	243	243	243	243	243	243	243	243	243
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		0.602	1.819	0.044	0.057	0.277	0.106	576,603	125.241	7.366	0.587	2.228	0.025	195.988	2.148
Median		0.6	1.51	0.04	0.031	0.167	0.03	243,576	99.588	7.393	0.595	1.792	0	200	2
Std. Deviation		0.092	1.425	0.023	0.107	0.317	0.163	3,376,754	202.008	1.531	0.15	2.282	0.156	32.728	0.964
Skewness		0.107	-0.188	1.046	8.045	0.84	1.974	13	13.198	-0.137	-0.148	7.33	6.164	-1.405	0.929
Std. Error of Skewness		0.156	0.156	0.156	0.156	0.156	0.156	0	0.156	0.156	0.156	0.156	0.156	0.156	0.156
Kurtosis		0.792	11.371	1.354	79.351	-0.686	3.552	183	193.478	-0.404	0.079	85.501	36.292	10.016	1.023
Std. Error of Kurtosis		0.311	0.311	0.311	0.311	0.311	0.311	0	0.311	0.311	0.311	0.311	0.311	0.311	0.311
Minimum		0.35	-8.168	0.006	0.005	0	0	17,773	0.713	3.275	0.19	-4.754	0	0	1
Maximum		0.95	7.236	0.137	1.258	0.994	0.804	49,149,338	3089.728	10.971	1.14	29.581	1	300	6
Percentiles	25	0.55	0.931	0.026	0.019	0	0	140,558	70.163	6.197	0.482	1.294	0	200	1
	50	0.6	1.51	0.04	0.031	0.167	0.03	243,576	99.588	7.393	0.595	1.792	0	200	2
	75	0.65	2.424	0.054	0.057	0.526	0.139	364,650	140.257	8.604	0.694	2.737	0	200	3

Leverage Ratio - Tests of Normality - Peasnell Model - Table 4.2.1.3b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.12	243	0	0.97	243	0
LRComp	0.141	243	0	0.817	243	0
ϬCFO	0.101	243	0	0.938	243	0
ϬWCA	0.314	243	0	0.355	243	0
AQPeasnell	0.191	243	0	0.82	243	0
LRAAQ	0.259	243	0	0.698	243	0
LAmount	0.434	243	0	0.089	243	0
OpCycle	0.282	243	0	0.234	243	0
FirmSize	0.046	243	0.2	0.993	243	0.285
Leverage	0.046	243	0.2	0.987	243	0.028
Growth	0.18	243	0	0.543	243	0
Recession	0.538	243	0	0.139	243	0
Interest	0.475	243	0	0.434	243	0
CovNum	0.281	243	0	0.848	243	0

LR - Stage 1 of Two Stage Least Squares – Peasnell Model

Table 4.2.1.3c

Dependent Variable	CovThres	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values		0.002	1.128	-0.152	0.014	0.051	0	0	0.006	0.303	-0.002	-0.042	0	0
T Values		0.436	4.667	-2.969	0.553	1.125	-1.361	-3.069	1.694	6.916	-0.997	-1.4	4.71	1.65
Significance		0.663	0	0.003	0.581	0.262	0.175	0.002	0.092	0	0.32	0.163	0	0.1
VIF		1.925	1.433	1.418	2.827	2.55	1.085	1.081	1.51	2.04	1.138	1.022	1.19	1.072

R-Squared	42.80%
Adjusted R Squared	39.50%
Regression Sig.	0.00%
Breusch-Pagan Test	45.10%

Table 4.2.1.3d

Dependent Variable	Interest	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values		-0.62	42.64	1.113	-6.085	9.292	0	0.002	-3.389	-18.135	-0.328	5.984	0	0
T Values		-0.303	0.386	0.048	-0.545	0.45	-0.6	0.214	-2.006	-0.906	-0.334	0.437	-0.176	-0.528
Significance		0.762	0.7	0.962	0.586	0.653	0.549	0.831	0.046	0.366	0.739	0.662	0.861	0.598
VIF		1.925	1.433	1.418	2.827	2.55	1.085	1.081	1.51	2.04	1.138	1.022	1.19	1.072

R-Squared	5.30%
Adjusted R Squared	0%
Regression Sig.	46.60%

Table 4.2.1.3e

Dependent Variable	CovNum	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values		0.113	1.991	0.06	0.445	-0.323	0	0	-0.335	0.43	-0.033	-0.191	0	0
T Values		2.295	0.753	0.107	1.664	-0.654	0.096	0.967	-8.272	0.897	-1.38	-0.582	-2.684	2.956
Significance		0.023	0.452	0.914	0.097	0.514	0.924	0.335	0	0.371	0.169	0.561	0.008	0.003
VIF		1.925	1.433	1.418	2.827	2.55	1.085	1.081	1.51	2.04	1.138	1.022	1.19	1.072

R-Squared	37.30%
Adjusted R Squared	33.70%
Regression Sig.	0.00%

Table 4.2.1.3f

Dependent Variable	ICR	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession

R-Squared	47.20%

Beta Values	-0.038	-0.1	-3.919	0.632	-1.289	0	-0.001	0.113	-2.864	0.26	-0.351
T Values	-0.531	-0.02	-1.507	1.32	-1.538	-2.288	-0.735	1.392	-3.883	3.815	-0.692
Significance	0.597	0.984	0.136	0.191	0.128	0.025	0.465	0.168	0	0	0.491
VIF	1.385	1.752	1.577	3.164	2.898	1.184	1.275	1.657	1.632	1.347	1.082

Adjusted R Squared	39.50%
Regression Sig.	0.00%

LR - Stage 2 of Two Stage Least Squares – Peasnell

Table 4.2.1.3g

Dependent Variable	CovThres

	ICRhat	Inthat	CovNumhat	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
Beta Values	-0.001	-0.012	0.101	-0.014	1.464	-0.142	-0.107	0.204	0	0	-0.004	0	0
T Values	-0.257	-7.084	4.66	-2.138	5.746	-2.749	-3.413	4.003	-4.416	-2.915	-1.577	5.829	-3.08
Significance	0.798	0	0	0.034	0	0.006	0.001	0	0	0.004	0.116	0	0.002
VIF	1.112	7.779	7.473	4.32	1.566	1.423	4.566	3.179	1.284	1.099	1.204	1.497	2.397

R-Squared	41.90%
Adjusted R Squared	38.60%
Regression Sig.	0.00%
Breusch-Pagan Test	61.10%

Pearson Correlations

	CovThres	ICRhat	Inthat	CovNumhat	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
CovThres	1.000	-.144	-.366	-.078	.350	.058	-.072	-.020	.081	-.152	-.147	-.049	.182	.082
ICRhat		1.000	.129	-.052	-.163	.016	-.063	.030	-.021	-.011	-.008	.049	-.130	-.184
Inthat			1.000	.575	-.521	.492	.139	-.043	.012	.052	.195	-.142	-.029	-.045
CovNumhat				1.000	.064	.391	.128	.112	.066	.210	.139	-.151	-.224	.396
LRComp					1.000	-.153	-.078	-.178	-.085	-.085	-.039	.147	.037	.036
ϬCFO						1.000	.221	-.088	-.001	.070	.244	.117	-.008	.110
ϬWCA							1.000	.334	.230	.036	.086	.025	.342	.033
AQPeasnell								1.000	.762	.060	-.031	-.074	.030	.002
LRAAQ									1.000	-.021	-.046	-.057	-.022	.081
LAmount										1.000	.007	-.038	-.001	-.026
OpCycle											1.000	.044	.067	-.064
Growth												1.000	-.019	.056
SIC4													1.000	-.127
SIC5														1.000

Table 4.2.1.3h

Dependent Variable	Interest

	ICRhat	LRhat	CovNumhat	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
Beta Values	2.844	-64.271	8.587	-1.182	95.922	-7.29	-10.214	17.643	0	-0.004	-0.336	0	0
T Values	1.866	-1.05	1.635	-0.518	0.71	-0.29	-0.891	0.847	-0.708	-0.339	-0.317	1.102	-0.457
Significance	0.063	0.295	0.103	0.605	0.478	0.772	0.374	0.398	0.479	0.735	0.752	0.272	0.648
VIF	1.114	3.123	2.188	2.426	2.176	1.666	3.027	2.636	1.153	1.266	1.345	1.61	1.461

R-Squared	6.70%
Adjusted R Squared	1.40%
Regression Sig.	23.90%

Table 4.2.1.3i

Dependent Variable	CovNum

	ICRhat	LRhat	Inthat	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
Beta Values	0.204	9.528	0.115	0.171	-13.788	1.474	0.958	-1.832	0	0.001	0.021	0	0
T Values	5.91	4.721	8.36	3.666	-3.378	2.463	3.724	-3.636	4.366	2.615	0.813	-4.167	5.51
Significance	0	0	0	0	0.001	0.015	0	0	0	0.01	0.417	0	0
VIF	1.114	6.642	4.843	1.977	3.89	1.844	2.984	3.015	1.303	1.384	1.521	2.066	1.121

R-Squared	45.00%
Adjusted R Squared	41.90%
Regression Sig.	0.00%

Table 4.2.1.3j

Dependent Variable	ICR

	LRhat	Inthat	CovNumhat	LRComp	ϬCFO	ϬWCA	AQPeasnell	LRAAQ	OpCycle
Beta Values	-6.448	0.055	-1.292	0.243	10.676	-2.449	1.694	-2.295	-0.002
T Values	-2.278	1.552	-3.667	2.524	1.396	-0.814	2.506	-2.085	-1.205
Significance	0.026	0.125	0	0.014	0.167	0.418	0.014	0.04	0.232
VIF	3.232	5.874	3.21	1.951	3.154	1.646	4.915	3.893	1.369

R-Squared	30.40%
Adjusted R Squared	22.30%
Regression Sig.	0.01%

LEVERAGE RATIO FINANCIAL COVENANT – DECHOW AND DICHEV (DD) MODEL

Leverage Ratio - Dechow and Dichev (DD) Model - Descriptives - Table 4.2.1.4a

	CovThres	LRComp	ϬCFO	ϬWC	AQDD	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum

N	Valid	243	243	243	243	243	243	243	243	243	243	243	243	243	243
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		0.602	1.819	0.044	0.054	0.258	0.105	576,603	125.241	7.366	0.587	2.228	0.025	195.988	2.148
Median		0.6	1.51	0.04	0.041	0.172	0.024	243,576	99.588	7.393	0.595	1.792	0	200	2
Std. Deviation		0.092	1.425	0.023	0.047	0.287	0.165	3,376,754	202.008	1.531	0.15	2.282	0.156	32.728	0.964
Skewness		0.107	-0.188	1.046	2.898	0.764	2.096	13	13.198	-0.137	-0.148	7.33	6.164	-1.405	0.929
Std. Error of Skewness		0.156	0.156	0.156	0.156	0.156	0.156	0	0.156	0.156	0.156	0.156	0.156	0.156	0.156
Kurtosis		0.792	11.371	1.354	12.838	-0.711	4.18	183	193.478	-0.404	0.079	85.501	36.292	10.016	1.023
Std. Error of Kurtosis		0.311	0.311	0.311	0.311	0.311	0.311	0	0.311	0.311	0.311	0.311	0.311	0.311	0.311
Minimum		0.35	-8.168	0.006	0.008	0	0	17,773	0.713	3.275	0.19	-4.754	0	0	1
Maximum		0.95	7.236	0.137	0.363	0.958	0.767	49,149,338	3089.728	10.971	1.14	29.581	1	300	6
Percentiles	25	0.55	0.931	0.026	0.024	0	0	140,558	70.163	6.197	0.482	1.294	0	200	1
	50	0.6	1.51	0.04	0.041	0.172	0.024	243,576	99.588	7.393	0.595	1.792	0	200	2
	75	0.65	2.424	0.054	0.071	0.485	0.145	364,650	140.257	8.604	0.694	2.737	0	200	3

Leverage Ratio - Tests of Normality - DD Model - Table 4.2.1.4b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.12	243	0	0.97	243	0
LRComp	0.141	243	0	0.817	243	0
ƃCFO	0.101	243	0	0.938	243	0
ƃWC	0.16	243	0	0.747	243	0
AQDD	0.216	243	0	0.835	243	0
LRAAQ	0.263	243	0	0.685	243	0
LAmount	0.434	243	0	0.089	243	0
OpCycle	0.282	243	0	0.234	243	0
FirmSize	0.046	243	.200*	0.993	243	0.285
Leverage	0.046	243	.200*	0.987	243	0.028
Growth	0.18	243	0	0.543	243	0
Recession	0.538	243	0	0.139	243	0
Interest	0.475	243	0	0.434	243	0
CovNum	0.281	243	0	0.848	243	0

LR - Stage 1 of Two Stage Least Squares – DD Model

Dependent Variable: CovThres — **Table 4.2.1.4c**

	LRComp	ƃCFO	ƃWC	AQDD	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	0	0.94	0.019	-0.037	0.039	0	0	0.007	0.311	-0.003	-0.038	0	0
T Values	0.101	3.855	0.174	-1.453	0.906	-1.428	-2.991	1.853	6.909	-1.209	-1.255	3.593	1.75
Significance	0.919	0	0.862	0.147	0.366	0.155	0.003	0.065	0	0.228	0.211	0	0.082
VIF	1.913	1.402	1.159	2.384	2.328	1.08	1.134	1.509	2.066	1.139	1.014	1.051	1.1

R-Squared	40.50%
Adjusted R-Squared	37.10%
Regression Sig.	0.00%
Breusch-Pagan Test	36.60%

Dependent Variable: Interest — **Table 4.2.1.4d**

	LRComp	ƃCFO	ƃWC	AQDD	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	-0.356	63.802	-1.208	6.168	6.964	0	0.001	-3.384	-18.904	-0.302	5.364	0	0
T Values	-0.175	0.586	-0.025	0.546	0.36	-0.582	0.056	-2.01	-0.942	-0.307	0.395	-0.06	-0.731
Significance	0.861	0.558	0.98	0.586	0.719	0.561	0.956	0.046	0.347	0.759	0.694	0.952	0.465
VIF	1.913	1.402	1.159	2.384	2.328	1.08	1.134	1.509	2.066	1.139	1.014	1.051	1.1

R-Squared	5.80%
Adjusted R-Squared	0.05%
Regression Sig.	37.00%

Dependent Variable: CovNum — **Table 4.2.1.4e**

	LRComp	ƃCFO	ƃWC	AQDD	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	0.103	1.005	1.045	0.225	-0.172	0	0	-0.334	0.348	-0.034	-0.19	0	0
T Values	2.09	0.382	0.892	0.825	-0.367	0.327	0.707	-8.215	0.718	-1.425	-0.577	-2.504	2.797
Significance	0.038	0.703	0.373	0.41	0.714	0.744	0.481	0	0.474	0.155	0.565	0.013	0.006
VIF	1.913	1.402	1.159	2.384	2.328	1.08	1.134	1.509	2.066	1.139	1.014	1.051	1.1

R-Squared	36.50%
Adjusted R-Squared	32.90%
Regression Sig.	0.00%

Dependent Variable: ICR — **Table 4.2.1.4f**

	LRComp	ƃCFO	ƃWC	AQDD	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	-0.038	-0.479	-3.84	0.454	-1.236	0	-0.001	0.132	-2.747	0.279	-0.47

R-Squared	46.30%
Adjusted R-Squared	38.40%

T Values	-0.532	-0.1	-1.337	0.892	-1.338	-1.97	-0.43	1.576	-3.651	4.028	-0.932
Significance	0.596	0.921	0.185	0.375	0.185	0.053	0.668	0.119	0	0	0.354
VIF	1.393	1.567	1.439	2.513	2.424	1.179	1.415	1.722	1.668	1.362	1.049

Regression Sig.	0.00%

LR - Stage 2 of Two Stage Least Squares – DD Model

Dependent Variable	CovThres

Table 4.2.1.4g

	ICRhat	Inthat	CovNumhat	LRComp	ϬCFO	ϬWC	AQDD	LRAAQ	LAmount	OpCycle	SIC4	SIC5
Beta Values	-0.001	-0.013	0.115	-0.015	1.612	-0.112	0.024	0.147	0	0	0	0
T Values	-0.352	-7.532	5.35	-2.494	6.055	-0.993	0.925	3.098	-4.778	-3.564	5.51	-4.015
Significance	0.725	0	0	0.013	0	0.322	0.356	0.002	0	0	0	0
VIF	1.104	8.524	6.886	3.426	1.636	1.221	2.481	2.747	1.321	1.146	1.332	2.612

R-Squared	39.00%
Adjusted R Squared	35.80%
Regression Sig.	0.00%
Breusch-Pagan Test	44.40%

Pearson Correlations

	CovThres	ICRhat	Inthat	CovNumhat	LRComp	ϬCFO	ϬWC	AQDD	LRAAQ	LAmount	OpCycle	SIC4	SIC5
CovThres	1.000	-.150	-.365	-.088	.350	.058	.028	-.068	-.004	-.152	-.147	.182	.082
ICRhat		1.000	.128	-.052	-.163	.016	.007	-.002	-.055	-.011	-.008	-.129	-.177
Inthat			1.000	.596	-.497	.470	.098	.284	.237	.050	.186	-.027	-.043
CovNumhat				1.000	.065	.395	.186	.126	.067	.212	.141	-.226	.400
LRComp					1.000	-.153	.016	-.037	.028	-.085	-.039	.037	.036
ϬCFO						1.000	.287	-.054	-.011	.070	.244	-.008	.110
ϬWC							1.000	-.011	.060	-.002	.245	-.048	.008
AQDD								1.000	.745	-.081	.063	-.148	.178
LRAAQ									1.000	-.059	.073	-.095	.182
LAmount										1.000	.007	-.001	-.026
OpCycle											1.000	.067	-.064
SIC4												1.000	-.127
SIC5													1.000

Dependent Variable	Interest

Table 4.2.1.4h

	ICRhat	LRhat	CovNumhat	LRComp	ϬCFO	ϬWC	AQDD	LRAAQ	LAmount	OpCycle	SIC4	SIC5
Beta Values	2.891	-53.93	9.233	-1.228	100.042	-11.04	1.124	12.87	0	-0.005	0	0
T Values	1.909	-0.976	1.914	-0.617	0.861	-0.229	0.1	0.669	-0.74	-0.391	1.112	-0.715
Significance	0.058	0.33	0.057	0.538	0.39	0.819	0.921	0.504	0.46	0.696	0.267	0.476
VIF	1.11	2.432	1.826	1.861	1.628	1.168	2.412	2.346	1.156	1.319	1.255	1.386

R-Squared	7.20%
Adjusted R Squared	2.40%
Regression Sig.	12.80%

Dependent Variable	CovNum

Table 4.2.1.4i

	ICRhat	LRhat	Inthat	LRComp	ϬCFO	ϬWC	AQDD	LRAAQ	OpCycle	Growth	SIC4	SIC5
Beta Values	0.193	5.09	0.094	0.184	-8.241	0.966	-0.27	-0.94	0.001	-0.012	0	0
T Values	5.358	2.706	6.787	3.94	-2.104	0.844	-0.993	-2.002	1.827	-0.468	-2.691	5.949
Significance	0	0.007	0	0	0.036	0.399	0.322	0.046	0.069	0.64	0.008	0
VIF	1.106	4.97	4.865	1.807	3.261	1.16	2.486	2.46	1.458	1.447	1.506	1.155

R-Squared	39.30%
Adjusted R Squared	36.10%
Regression Sig.	0.00%

Dependent Variable	ICR

Table 4.2.1.4j

	LRhat	Inthat	CovNumhat	LRComp	ϬCFO	ϬWC	AQDD	LRAAQ	OpCycle
Beta Values	-7.908	0.048	-1.334	0.23	10.227	-0.186	0.658	-1.994	-0.002
T Values	-2.841	1.4	-4.023	2.606	1.376	-0.058	1.163	-1.849	-1.08
Significance	0.006	0.165	0	0.011	0.173	0.954	0.249	0.068	0.284
VIF	2.941	5.738	2.727	1.672	3.017	1.433	2.493	2.649	1.504

R-Squared	31.30%
Adjusted R Squared	23.20%
Regression Sig.	0.00%

LEVERAGE RATIO FINANCIAL COVENANT – MCNICHOLS MODEL

Leverage Ratio - McNichols Model - Descriptives - Table 4.2.1.5a

		CovThres	LRComp	ϬCFO	ϬWC	AQMcNichols	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	243	243	243	243	243	243	243	243	243	243	243	243	243	243
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Mean		0.602	1.819	0.044	0.054	0.481	0.198	576,603	125.241	7.366	0.587	2.228	0.025	195.988	2.148
Median		0.6	1.51	0.04	0.041	0.583	0.126	243,576	99.588	7.393	0.595	1.792	0	200	2
Std. Deviation		0.092	1.425	0.023	0.047	0.374	0.226	3,376,754	202.008	1.531	0.15	2.282	0.156	32.728	0.964
Skewness		0.107	-0.188	1.046	2.898	-0.121	1.234	13	13.198	-0.137	-0.148	7.33	6.164	-1.405	0.929
Std. Error of Skewness		0.156	0.156	0.156	0.156	0.156	0.156	0	0.156	0.156	0.156	0.156	0.156	0.156	0.156
Kurtosis		0.792	11.371	1.354	12.838	-1.607	0.743	183	193.478	-0.404	0.079	85.501	36.292	10.016	1.023
Std. Error of Kurtosis		0.311	0.311	0.311	0.311	0.311	0.311	0	0.311	0.311	0.311	0.311	0.311	0.311	0.311
Minimum		0.35	-8.168	0.006	0.008	0	0	17,773	0.713	3.275	0.19	-4.754	0	0	1
Maximum		0.95	7.236	0.137	0.363	0.996	0.909	49,149,338	3089.728	10.971	1.14	29.581	1	300	6
Percentiles	25	0.55	0.931	0.026	0.024	0.005	0	140,558	70.163	6.197	0.482	1.294	0	200	1
	50	0.6	1.51	0.04	0.041	0.583	0.126	243,576	99.588	7.393	0.595	1.792	0	200	2
	75	0.65	2.424	0.054	0.071	0.837	0.306	364,650	140.257	8.604	0.694	2.737	0	200	3

Leverage Ratio - Tests of Normality - McNichols Model - Table 4.2.1.5b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.12	243	0	0.97	243	0
LRComp	0.141	243	0	0.817	243	0
ϬCFO	0.101	243	0	0.938	243	0
ϬWC	0.16	243	0	0.747	243	0
AQMcNichols	0.159	243	0	0.859	243	0
LRAAQ	0.191	243	0	0.831	243	0
LAmount	0.434	243	0	0.089	243	0
OpCycle	0.282	243	0	0.234	243	0
FirmSize	0.046	243	.200*	0.993	243	0.285
Leverage	0.046	243	.200*	0.987	243	0.028
Growth	0.18	243	0	0.543	243	0
Recession	0.538	243	0	0.139	243	0
Interest	0.475	243	0	0.434	243	0
CovNum	0.281	243	0	0.848	243	0

LR - Stage 1 of Two Stage Least Squares – McNichols Model

Dependent Variable: CovThres — **Table 4.2.1.5c**

	LRComp	ϬCFO	ϬWC	AQMcNichols	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	0.001	0.95	0.001	-0.012	0.043	0	0	0.007	0.31	-0.003	-0.043	0	0
T Values	0.117	3.902	0.008	-0.658	1.351	-1.517	-3.193	1.732	6.873	-1.252	-1.402	3.814	1.518
Significance	0.907	0	0.994	0.511	0.178	0.131	0.002	0.085	0	0.212	0.162	0	0.13
VIF	1.935	1.396	1.199	2.161	2.292	1.101	1.125	1.536	2.073	1.143	1.015	1.032	1.073

R-Squared	40.40%
Adjusted R Squared	37.00%
Regression Sig.	0.00%
Breusch-Pagan Test	13.60%

Dependent Variable: Interest — **Table 4.2.1.5d**

	LRComp	ϬCFO	ϬWC	AQMcNichols	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	-0.524	47.932	-12.223	2.168	8.939	0	0.001	-3.664	-17.366	-0.389	5.39	0	0
T Values	-0.256	0.441	-0.248	0.262	0.635	-0.826	0.114	-2.157	-0.863	-0.395	0.396	-0.181	-0.637
Significance	0.798	0.66	0.804	0.793	0.526	0.41	0.909	0.032	0.389	0.693	0.692	0.857	0.525
VIF	1.935	1.396	1.199	2.161	2.292	1.101	1.125	1.536	2.073	1.143	1.015	1.032	1.073

R-Squared	5.80%
Adjusted R Squared	0.04%
Regression Sig.	38.00%

Dependent Variable: CovNum — **Table 4.2.1.5e**

	LRComp	ϬCFO	ϬWC	AQMcNichols	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values	0.1	0.577	0.594	0.154	0.219	0	0	-0.347	0.381	-0.036	-0.201	0	0
T Values	2.026	0.221	0.502	0.776	0.646	0.012	0.675	-8.505	0.789	-1.536	-0.616	-2.613	2.738
Significance	0.044	0.825	0.616	0.439	0.519	0.99	0.5	0	0.431	0.126	0.539	0.01	0.007
VIF	1.935	1.396	1.199	2.161	2.292	1.101	1.125	1.536	2.073	1.143	1.015	1.032	1.073

R-Squared	37.30%
Adjusted R Squared	33.70%
Regression Sig.	0.00%

Dependent Variable: ICR — **Table 4.2.1.5f**

	LRComp	ϬCFO	ϬWC	AQMcNichols	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	-0.048	-0.781	-3.569	0.061	-0.41	0	0	0.132	-2.681	0.276	-0.531
T Values	-0.653	-0.163	-1.155	0.169	-0.614	-1.738	-0.27	1.554	-3.521	3.883	-1.044
Significance	0.516	0.871	0.252	0.866	0.541	0.086	0.788	0.124	0.001	0	0.3

R-Squared	45.30%
Adjusted R Squared	37.30%
Regression Sig.	0.00%

VIF	1.397	1.529	1.638	2.198	2.366	1.264	1.388	1.743	1.678	1.412	1.049

LR - Stage 2 of TWO STAGE LEAST SQUARES – McNichols Model

Dependent Variable	CovThres

Table 4.2.1.5g

	ICRhat	Inthat	CovNumhat	LRComp	ΔCFO	ΔWC	AQMcNichols	LRAAQ	LAmount	Growth	SIC4	SIC5
Beta Values	0	-0.013	0.109	-0.014	1.409	-0.271	0	0.128	0	-0.005	0	0
T Values	-0.085	-6.757	4.501	-2.036	5.355	-2.262	-0.022	3.559	-5.066	-2.029	4.795	-3.119
Significance	0.932	0	0	0.043	0	0.025	0.983	0	0	0.044	0	0.002
VIF	1.111	9.518	8.579	4.165	1.537	1.333	2.153	2.81	1.539	1.204	1.301	2.633

R-Squared	36.50%
Adjusted R-Squared	33.20%
Regression Sig.	0.00%
Breusch-Pagan Test	5.80%

Pearson Correlations

	CovThres	ICRhat	Inthat	CovNumhat	LRComp	ΔCFO	ΔWC	AQMcNichols	LRAAQ	LAmount	Growth	SIC4	SIC5
CovThres	1.000	-.147	-.335	-.074	.350	.058	.028	.036	.071	-.152	-.049	.182	.082
ICRhat		1.000	.115	-.060	-.163	.016	.007	-.022	-.072	-.011	.049	-.130	-.178
Inthat			1.000	.623	-.499	.472	.098	.195	.211	.050	-.136	-.028	-.043
CovNumhat				1.000	.064	.391	.184	.128	.129	.210	-.151	-.224	.396
LRComp					1.000	-.153	.016	-.029	.061	-.085	.147	.037	.036
ΔCFO						1.000	.287	.053	.095	.070	.117	-.008	.110
ΔWC							1.000	.155	.236	-.002	.090	-.048	.008
AQMcNichols								1.000	.722	.059	.039	-.059	.099
LRAAQ									1.000	.106	.113	-.043	.096
LAmount										1.000	-.038	-.001	-.026
Growth											1.000	-.019	.056
SIC4												1.000	-.127
SIC5													1.000

Dependent Variable	Interest

Table 4.2.1.5h

	ICRhat	LRhat	CovNumhat	LRComp	ΔCFO	ΔWC	AQMcNichols	LRAAQ	LAmount	Growth	SIC4	SIC5
Beta Values	3.115	-48.485	9.362	-1.354	84.202	-22.265	-0.858	11.264	0	-0.329	0	0
T Values	2.056	-0.875	1.835	-0.639	0.714	-0.462	-0.105	0.813	-0.901	-0.309	1.027	-0.572
Significance	0.041	0.382	0.068	0.524	0.476	0.644	0.916	0.417	0.368	0.758	0.306	0.568
VIF	1.109	2.444	2.086	2.116	1.68	1.168	2.149	2.267	1.151	1.372	1.206	1.421

R-Squared	7.30%
Adjusted R-Squared	2.50%
Regression Sig.	12.00%

Dependent Variable	CovNum

Table 4.2.1.5i

	ICRhat	LRhat	Inthat	LRComp	ΔCFO	ΔWC	AQMcNichols	LRAAQ	LAmount	SIC4	SIC5
Beta Values	0.202	5.893	0.098	0.192	-8.165	2.146	-0.011	-0.809	0	0	0
T Values	5.844	4.087	9.152	4.486	-2.719	1.938	-0.061	-2.47	4.483	-2.786	5.773
Significance	0	0	0	0	0.007	0.054	0.951	0.014	0	0.006	0
VIF	1.106	3.159	3.097	1.65	2.076	1.178	2.144	2.417	1.212	1.273	1.105

R-Squared	43.70%
Adjusted R-Squared	41.00%
Regression Sig.	0.00%

Dependent Variable	ICR

Table 4.2.1.5j

	LRhat	Inthat	CovNumhat	LRComp	ΔCFO	ΔWC	AQMcNichols	LRAAQ	OpCycle
Beta Values	-7.515	0.04	-1.177	0.194	8.803	0.41	0.005	-0.554	-0.002
T Values	-2.976	1.324	-3.566	2.212	1.307	0.121	0.013	-0.744	-0.927
Significance	0.004	0.189	0.001	0.03	0.195	0.904	0.989	0.459	0.357
VIF	2.401	4.597	2.828	1.62	2.43	1.574	2.081	2.352	1.485

R-Squared	29.90%
Adjusted R-Squared	21.70%
Regression Sig.	0.01%

LEVERAGE RATIO FINANCIAL COVENANT – FRANCIS MODEL

Leverage Ratio - Francis Model - Descriptives - Table 4.2.1.6a

		CovThres	LRComp	ΔCFO	ΔTCA	AQFrancis	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	243	243	243	243	243	243	243	243	243	243	243	243	243	243

	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mean	0.602	1.819	0.044	0.041	0.383	0.136	576,603	125.241	7.366	0.587	2.228	0.025	195.988	2.148
	Median	0.6	1.51	0.04	0.028	0.312	0.048	243,576	99.588	7.393	0.595	1.792	0	200	2
	Std. Deviation	0.092	1.425	0.023	0.039	0.371	0.177	3,376,754	202.008	1.531	0.15	2.282	0.156	32.728	0.964
	Skewness	0.107	-0.188	1.046	2.362	0.285	1.292	13	13.198	-0.137	-0.148	7.33	6.164	-1.405	0.929
	Std. Error of Skewness	0.156	0.156	0.156	0.156	0.156	0.156	0	0.156	0.156	0.156	0.156	0.156	0.156	0.156
	Kurtosis	0.792	11.371	1.354	7.019	-1.534	0.691	183	193.478	-0.404	0.079	85.501	36.292	10.016	1.023
	Std. Error of Kurtosis	0.311	0.311	0.311	0.311	0.311	0.311	0	0.311	0.311	0.311	0.311	0.311	0.311	0.311
	Minimum	0.35	-8.168	0.006	0.005	0	0	17,773	0.713	3.275	0.19	-4.754	0	0	1
	Maximum	0.95	7.236	0.137	0.24	1	0.698	49,149,338	3089.728	10.971	1.14	29.581	1	300	6
	25	0.55	0.931	0.026	0.018	0	0	140,558	70.163	6.197	0.482	1.294	0	200	1
Percentiles	50	0.6	1.51	0.04	0.028	0.312	0.048	243,576	99.588	7.393	0.595	1.792	0	200	2
	75	0.65	2.424	0.054	0.054	0.743	0.223	364,650	140.257	8.604	0.694	2.737	0	200	3

Leverage Ratio - Tests of Normality - Francis Model - Table 4.2.1.6b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.12	243	0	0.97	243	0
LRComp	0.141	243	0	0.817	243	0
ΔCFO	0.101	243	0	0.938	243	0
ΔTCA	0.192	243	0	0.757	243	0
AQFrancis	0.223	243	0	0.835	243	0
LRAAQ	0.221	243	0	0.782	243	0
LAmount	0.434	243	0	0.089	243	0
OpCycle	0.282	243	0	0.234	243	0
FirmSize	0.046	243	.200*	0.993	243	0.285
Leverage	0.046	243	.200*	0.987	243	0.028
Growth	0.18	243	0	0.543	243	0
Recession	0.538	243	0	0.139	243	0
Interest	0.475	243	0	0.434	243	0
CovNum	0.281	243	0	0.848	243	0

LR - Stage 1 of Two Stage Least Squares – Francis Model

Table 4.2.1.6c

Dependent Variable	CovThres	LRComp	ΔCFO	ΔTCA	AQFrancis	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values		0.001	1.117	-0.409	-0.006	0.045	0	0	0.006	0.308	-0.002	-0.031	0	0
T Values		0.216	4.643	-3.1	-0.327	1.132	-1.413	-2.484	1.497	6.987	-1.009	-1.025	4.07	1.645
Significance		0.829	0	0.002	0.744	0.259	0.159	0.014	0.136	0	0.314	0.306	0	0.101
VIF		1.886	1.415	1.226	2.323	2.288	1.077	1.121	1.561	2.052	1.145	1.033	1.037	1.092

R-Squared	42.60%
Adjusted R Squared	39.30%
Regression Sig.	0.00%
Breusch-Pagan Test	16.60%

Table 4.2.1.6d

Dependent Variable	Interest	LRComp	ΔCFO	ΔTCA	AQFrancis	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values		-0.449	52.653	28.682	-6.454	5.1	0	0.001	-3.059	-18.979	-0.283	4.386	0	0
T Values		-0.222	0.481	0.478	-0.748	0.285	-0.678	0.103	-1.784	-0.947	-0.287	0.319	-0.29	-0.46
Significance		0.825	0.631	0.633	0.455	0.776	0.498	0.918	0.076	0.345	0.774	0.75	0.772	0.646
VIF		1.886	1.415	1.226	2.323	2.288	1.077	1.121	1.561	2.052	1.145	1.033	1.037	1.092

R-Squared	5.50%
Adjusted R Squared	0.02%
Regression Sig.	42.40%

Table 4.2.1.6e

Dependent Variable	CovNum	LRComp	ΔCFO	ΔTCA	AQFrancis	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5
Beta Values		0.099	0.34	2.141	0.177	-0.315	0	0	-0.333	0.432	-0.037	-0.183	0	0
T Values		2.032	0.129	1.483	0.854	-0.731	0.319	0.666	-8.064	0.896	-1.545	-0.553	-2.746	2.844
Significance		0.043	0.897	0.14	0.394	0.466	0.75	0.506	0	0.371	0.124	0.581	0.007	0.005
VIF		1.886	1.415	1.226	2.323	2.288	1.077	1.121	1.561	2.052	1.145	1.033	1.037	1.092

R-Squared	37.00%
Adjusted R Squared	33.40%
Regression Sig.	0.00%

Table 4.2.1.6f

Dependent Variable	ICR	LRComp	ΔCFO	ΔTCA	AQFrancis	LRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values		-0.032	2.147	-8.023	-0.042	-0.48	0	0	0.118	-2.788	0.253	-0.454

R-Squared	48.70%
Adjusted R Squared	41.20%

T Values	-0.451	0.448	-2.102	-0.107	-0.542	-2.2	-0.29	1.395	-3.904	3.634	-0.922
Significance	0.653	0.655	0.039	0.915	0.589	0.031	0.773	0.167	0	0.001	0.359
VIF	1.367	1.638	1.769	2.597	2.893	1.173	1.391	1.848	1.576	1.446	1.047

Regression Sig.	0.00%

LR - Stage 2 of Two Stage Least Square – Francis Model

Table 4.2.1.6g

Dependent Variable	CovThres

	ICRhat	Inthat	CovNumhat	LRComp	ϬCFO	ϬTCA	AQFrancis	LRAAQ	Lamount	SIC4	SIC5
Beta Values	-0.001	-0.013	0.102	-0.015	1.626	-0.303	-0.116	0.156	0	0	0
T Values	-0.27	-7.515	5.185	-2.444	6.364	-2.198	-4.925	3.664	-5.065	4.726	-2.984
Significance	0.788	0	0	0.015	0	0.029	0	0	0	0	0.003
VIF	1.114	8.092	6.043	3.369	1.536	1.286	3.432	2.589	1.365	1.212	2.068

R-Squared	39.90%
Adjusted R-Squared	37.00%
Regression Sig.	0.00%
Breusch-Pagan Test	5.45%

Pearson Correlations

	Cov Thres	ICRhat	Inthat	CovNumhat	LRComp	ϬCFO	ϬTCA	AQFrancis	LRAAQ	Lamount	SIC4	SIC5
Cov Thres	1.000	-.142	-.379	-.105	.350	.058	-.171	.023	.068	-.152	.182	.082
ICRhat		1.000	.138	-.067	-.163	.016	-.055	-.052	-.065	-.011	-.128	-.191
Inthat			1.000	.589	-.510	.482	.349	-.240	-.114	.051	-.028	-.044
CovNumhat				1.000	.064	.393	.333	.013	.005	.211	-.225	.398
LRComp					1.000	-.153	-.081	-.011	-.012	-.085	.037	.036
ϬCFO						1.000	.346	.111	.113	.070	-.008	.110
ϬTCA							1.000	.131	.120	.015	.043	.094
AQFrancis								1.000	.741	-.073	-.102	.136
LRAAQ									1.000	-.055	-.094	.187
Lamount										1.000	-.001	-.026
SIC4											1.000	-.127
SIC5												1.000

Table 4.2.1.6h

Dependent Variable	Interest

	ICRhat	LRhat	CovNumhat	LRComp	ϬCFO	ϬTCA	AQFrancis	LRAAQ	LAmount	Growth	SIC4	SIC5
Beta Values	2.8	-56.7	7.945	-1.064	104.884	-7.252	-8.136	11.302	0	-0.247	0	0
T Values	1.843	-0.978	1.498	-0.495	0.84	-0.111	-0.96	0.63	-0.798	-0.231	0.911	-0.346
Significance	0.067	0.329	0.135	0.621	0.402	0.912	0.338	0.529	0.425	0.818	0.363	0.73
VIF	1.117	2.804	2.222	2.159	1.87	1.476	2.278	2.335	1.147	1.37	1.275	1.488

R-Squared	6.80%
Adjusted R Squared	1.90%
Regression Sig.	16.80%

Table 4.2.1.6i

Dependent Variable	CovNum

	ICRhat	LRhat	Inthat	LRComp	ϬCFO	ϬTCA	AQFrancis	LRAAQ	LAmount	OpCycle	SIC4	SIC5
Beta Values	0.21	9.777	0.123	0.164	-16.974	2.883	1.098	-1.381	0	0.001	0	0
T Values	6.119	5.529	9.237	3.795	-4.554	1.977	4.856	-3.264	5.295	2.483	-3.639	5.253
Significance	0	0	0	0	0	0.049	0	0.001	0	0.014	0	0
VIF	1.119	5.119	4.759	1.722	3.271	1.444	3.185	2.547	1.288	1.32	1.411	1.135

R-Squared	45.20%
Adjusted R Squared	42.30%
Regression Sig.	0.00%

Table 4.2.1.6j

Dependent Variable	ICR

	LRhat	Inthat	LRComp	ϬCFO	ϬTCA	AQFrancis	LRAAQ	LAmount	OpCycle
Beta Values	-18.102	-0.102	0.03	30.76	-12.148	-0.585	-0.027	0	-0.002
T Values	-5.672	-3.246	0.433	3.858	-2.992	-1.149	-0.029	-5.178	-1.356
Significance	0	0.002	0.667	0	0.004	0.254	0.977	0	0.179
VIF	4.732	6.293	1.186	4.112	1.815	3.963	2.981	1.711	1.465

R-Squared	42.00%
Adjusted R Squared	35.20%
Regression Sig.	0.00%

CURRENT RATIO FINANCIAL COVENANT – JONES MODEL ANALYSIS

Current Ratio Covenant - Jones Model - Descriptives - Table 4.2.2.1a

		CovThres	CRComp	ϬCFO	ϬTA	AQJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	134	134	134	134	134	134	134	134	134	134	134	134	134	134

	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mean	1.35	2.037	0.079	0.083	0.224	0.085	637,828	119.361	5.22	0.614	1.979	0.03	239.832	3.246
	Median	1.25	1.835	0.068	0.058	0.122	0.018	396,141	104.499	5.327	0.514	1.557	0	200	3
	Std. Deviation	0.312	1.251	0.047	0.133	0.252	0.131	1,359,755	61.12	1.445	0.476	2.014	0.171	87.065	1.072
	Skewness	0.521	2.82	2.123	7.871	1.048	2.044	9	0.918	-0.085	5.518	2.033	5.588	1.863	0.645
	Std. Error of Skewness	0.209	0.209	0.209	0.209	0.209	0.209	0	0.209	0.209	0.209	0.209	0.209	0.209	0.209
	Kurtosis	-0.384	12.187	6.62	73.316	0.356	4.245	87	0.449	0.568	41.464	5.571	29.671	4.479	2.161
	Std. Error of Kurtosis	0.416	0.416	0.416	0.416	0.416	0.416	0	0.416	0.416	0.416	0.416	0.416	0.416	0.416
	Minimum	0.6	0.212	0.011	0.01	0	0	57,908	14.103	0.382	0.046	-1.579	0	100	1
	Maximum	2	9.376	0.29	1.392	0.99	0.646	14,675,768	321.122	9.591	4.666	11.476	1	600	7
	25	1.1	1.36	0.048	0.035	0	0	232,281	70.028	4.184	0.394	0.866	0	200	3
Percentiles	50	1.25	1.835	0.068	0.058	0.122	0.018	396,141	104.499	5.327	0.514	1.557	0	200	3
	75	1.5	2.315	0.095	0.088	0.376	0.139	628,590	157.271	6.363	0.679	2.416	0	300	4

Current Ratio Covenant - Tests of Normality - Jones Model - Table 4.2.2.1b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.164	134	0	0.934	134	0
CRComp	0.172	134	0	0.763	134	0
ΔCFO	0.13	134	0	0.825	134	0
ΔTA	0.294	134	0	0.347	134	0
AQJones	0.187	134	0	0.842	134	0
CRAAQ	0.258	134	0	0.702	134	0
LAmount	0.335	134	0	0.281	134	0
OpCycle	0.141	134	0	0.934	134	0
FirmSize	0.056	134	.200*	0.981	134	0.06
Leverage	0.234	134	0	0.54	134	0
Growth	0.175	134	0	0.822	134	0
Recession	0.54	134	0	0.16	134	0
Interest	0.37	134	0	0.709	134	0
CovNum	0.277	134	0	0.854	134	0

CR - Stage 1 of Two Stage Least Squares - Jones Model

Dependent Variable: CovThres

	CRComp	ΔCFO	ΔTA	AQJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.046	-0.31	-0.157	-0.059	0.07	0	0.001	-0.014	-0.205	-0.017	-0.294	0	0	0
T Values	2.147	-0.478	-0.764	-0.365	0.234	0.327	3.431	-0.675	-2.354	-1.378	-2.108	-2.425	0.741	1.109
Significance	0.034	0.633	0.447	0.716	0.816	0.744	0.001	0.501	0.02	0.171	0.037	0.017	0.46	0.27
VIF	1.4	1.834	1.461	3.262	2.974	2.25	1.385	1.695	3.392	1.276	1.119	1.215	2.373	1.195

R-Squared	37.70%
Adjusted R-Squared	30.40%
Regression Sig.	0.00%
Breusch-Pagan Test	32.60%

Dependent Variable: Interest

	CRComp	ΔCFO	ΔTA	AQJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	-2.763	26.325	-37.841	14.255	-47.607	0	0.102	-24.575	69.324	6.479	57.694	0	0	0
T Values	-0.421	0.132	-0.6	0.287	-0.52	-2.639	0.76	-3.932	2.581	1.665	1.343	2.016	-2.831	-0.984
Significance	0.675	0.895	0.55	0.775	0.604	0.009	0.449	0	0.011	0.099	0.182	0.046	0.005	0.327
VIF	1.4	1.834	1.461	3.262	2.974	2.25	1.385	1.695	3.392	1.276	1.119	1.215	2.373	1.195

R-Squared	24.40%
Adjusted R-Squared	15.50%
Regression Sig.	0.01%

Dependent Variable: CovNum

	CRComp	ΔCFO	ΔTA	AQJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.031	0.792	-1.386	0.758	-1.425	0	0	0.088	0.06	0.032	-0.479	0	0	0
T Values	0.351	0.294	-1.629	1.131	-1.156	0.618	-0.169	1.039	0.164	0.601	-0.827	-1.019	-0.971	0.576
Significance	0.726	0.769	0.106	0.26	0.25	0.538	0.866	0.301	0.87	0.549	0.41	0.31	0.334	0.566
VIF	1.4	1.834	1.461	3.262	2.974	2.25	1.385	1.695	3.392	1.276	1.119	1.215	2.373	1.195

R-Squared	9.50%
Adjusted R-Squared	0.00%
Regression Sig.	57.30%

Dependent Variable: ICR

	CRComp	ΔCFO	ΔTA	AQJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0.097	-2.548	0.423	0.379	-0.156	0	-0.003	0.173	-1.252	0.105	-0.788
T Values	0.572	-0.706	0.119	0.368	-0.084	2.47	-1.125	1.367	-1.947	0.976	-0.868
Significance	0.572	0.485	0.906	0.715	0.933	0.019	0.269	0.182	0.061	0.337	0.392

R-Squared	27.40%
Adjusted R-Squared	0.08%
Regression Sig.	44.50%

VIF	1.345	2.257	1.605	3.23	3.001	3.949	1.864	2.232	2.923	1.244	1.14

Dependent Variable	DEbitda										
	CRComp	**ΘCFO**	**ΘTA**	**AQJones**	**CRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	0.728	-2.611	10.701	-2.605	2.766	0	-0.013	0.341	4.626	-0.149	-1.741	0
T Values	2.767	-0.414	2.085	-1.424	0.837	-2.057	-2.523	1.638	4.126	-1.404	-0.94	1.565
Significance	0.008	0.681	0.043	0.162	0.407	0.046	0.016	0.109	0	0.168	0.353	0.125
VIF	1.878	2.017	1.658	3.965	3.753	3.377	1.756	2.012	2.617	1.355	1.146	1.28

R-Squared	51.90%
Adjusted R Squared	38.10%
Regression Sig.	0.01%

Dependent Variable	DTNWR										
	CRComp	**ΘCFO**	**ΘTA**	**AQJones**	**CRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	-0.802	5.944	32.538	-2.974	26.137	0	0.003	0.511	1.857	0.46	4.141	0
T Values	-0.765	0.331	2.485	-0.888	2.848	-0.178	0.303	0.84	0.656	1.577	1.39	1.254
Significance	0.452	0.744	0.021	0.384	0.009	0.86	0.765	0.41	0.519	0.129	0.178	0.223
VIF	2.975	3.674	1.927	2.158	2.332	8.863	1.643	2.831	6.605	1.611	1.293	1.339

R-Squared	61.10%
Adjusted R Squared	39.80%
Regression Sig.	1.50%

CR - Stage 2 of Two Stage Least Squares - Jones Model

Table 4.2.2.1c

Dependent Variable	CovThres														
	ICRhat	**DEbitdahat**	**DTNWRhat**	**INThat**	**CovNumhat**	**CRComp**	**ΘCFO**	**ΘTA**	**AQJones**	**CRAAQ**	**LAmount**	**OpCycle**	**Growth**	**Leverage**	**SIC2**
Beta Values	0.032	0.003	0.03	0.004	1.157	0.025	-1.546	1.645	-0.989	1.876	0	0.001	-0.084	-0.596	0
T Values	1.391	0.237	2.409	2.108	2.966	1.065	-2.147	2.614	-2.958	2.835	0.894	3.284	-2.832	-3.225	2.861
Significance	0.167	0.813	0.018	0.037	0.004	0.289	0.034	0.01	0.004	0.005	0.373	0.001	0.005	0.002	0.005
VIF	1.201	1.177	1.237	16.244	34.813	1.747	2.422	14.711	14.964	15.76	2.263	1.587	7.592	16.267	29.024

R-Squared	42.20%
Adjusted R-Squared	34.90%
Regression Sig.	0.00%
Breusch-Pagan Test	31.00%

Pearson Correlations

	CovThres	**ICRhat**	**DEbitdahat**	**DTNWRhat**	**INThat**	**CovNumhat**	**CRComp**	**ΘCFO**	**ΘTA**	**AQJones**	**CRAAQ**	**LAmount**	**OpCycle**	**Growth**	**Leverage**	**SIC2**
CovThres	1.000	.054	-.005	.133	-.097	.050	.397	-.185	-.151	-.096	.041	-.202	.401	-.052	-.309	-.096
ICRhat		1.000	.158	.087	-.186	.110	-.034	.137	-.055	.004	.017	.138	-.100	-.068	.037	-.018
DEbitdahat			1.000	-.212	-.230	.123	.098	.114	.007	.032	.066	.117	-.083	.069	.031	.045
DTNWRhat				1.000	.294	-.079	-.070	.092	.051	.038	.026	.090	.014	.076	.090	-.023
INThat					1.000	-.425	-.061	-.001	.122	-.050	-.076	-.020	.230	.169	.051	-.174
CovNumhat						1.000	-.003	-.116	-.521	.004	-.168	-.044	-.338	.211	-.226	-.404
CRComp							1.000	-.084	-.044	-.009	.071	-.127	.270	.038	-.351	-.059
ΘCFO								1.000	.290	.203	.023	.499	-.026	-.031	.400	.384
ΘTA									1.000	.416	.203	.091	-.015	-.013	.072	.007
AQJones										1.000	.748	-.019	-.031	.001	.052	-.048
CRAAQ											1.000	-.020	.158	-.009	.114	.006
LAmount												1.000	-.122	-.077	.552	.275
OpCycle													1.000	-.174	-.078	.067
Growth														1.000	-.244	-.029
Leverage															1.000	.642
SIC2																1.000

Dependent Variable	Interest												
	ICRhat	**DEbitdahat**	**DTNWRhat**	**CRhat**	**CovNumhat**	**CRComp**	**ΘCFO**	**ΘTA**	**AQJones**	**CRAAQ**	**SIC1**	**SIC2**	**SIC5**
Beta Values	-6.691	-0.272	7.741	-51.783	-131.232	3.424	146.813	-200.475	75.39	-156.941	0	0	0
T Values	-0.901	-0.076	1.954	-0.772	-2.725	0.408	0.772	-2.033	1.206	-1.411	0.325	-2.28	0.979
Significance	0.37	0.94	0.053	0.441	0.007	0.684	0.442	0.044	0.23	0.161	0.746	0.024	0.33
VIF	1.158	1.176	1.114	3.147	4.821	2.103	1.534	3.284	4.754	4.044	2.208	2.367	1.354

Table 4.2.2.1d

R-Squared	17.20%
Adjusted R Squared	8.20%
Regression Sig.	3.50%

Table 4.2.2.1e

Dependent Variable	CovNum															
	ICRhat	**DEbitdahat**	**DTNWRhat**	**CRhat**	**Inthat**	**CRComp**	**ΘCFO**	**ΘTA**	**AQJones**	**CRAAQ**	**LAmount**	**FirmSize**	**Leverage**	**Growth**	**SIC1**	**SIC5**

R-Squared	44.90%

Beta Values	0.302	0.169	0.253	0.498	0	-0.01	-2.008	-1.048	1.052	-2.328	0	0.111	0.013	0.008	0	0
T Values	3.866	4.643	5.86	0.6	-0.038	-0.119	-0.964	-1.518	1.932	-2.336	0.106	1	0.052	0.183	-0.15	2.123
Significance	0	0	0	0.55	0.97	0.906	0.337	0.132	0.056	0.021	0.916	0.319	0.959	0.855	0.881	0.036
VIF	1.236	1.179	1.279	4.656	4.158	2.146	1.779	1.555	3.483	3.135	3.275	4.753	2.792	1.389	2.362	1.162

Adjusted R Squared	37.40%
Regression Sig.	0.00%

Dependent Variable DEbitda

Table 4.2.2.1f

	ICRhat	DTNWRhat	CRhat	Inthat	CovNumhat	CRComp	ϬCFO	ϬTA	AQJones	CRAAQ	LAmount	Leverage	SIC2
Beta Values	0.274	0.137	-4.528	-0.015	-1.095	0.758	-3.426	10.206	-2.082	0.678	0	5.392	0
T Values	1.115	0.437	-2.126	-1.742	-0.681	2.489	-0.493	1.781	-0.926	0.168	-3.548	4.622	0.021
Significance	0.271	0.664	0.04	0.089	0.5	0.017	0.624	0.082	0.36	0.868	0.001	0	0.983
VIF	1.391	1.496	2.923	2.038	3.56	2.475	2.406	2.029	5.895	5.537	3.242	2.784	2.399

R-Squared	52.20%
Adjusted R Squared	37.00%
Regression Sig.	0.01%

Dependent Variable DTNWR

Table 4.2.2.1g

	ICRhat	DEbitdahat	CRhat	Inthat	CovNumhat	CRComp	ϬCFO	ϬTA	AQJones	Leverage	Growth
Beta Values	0.08	0.112	6.364	-0.03	-7.735	-0.761	2.679	26.143	8.593	4.313	1.01
T Values	0.135	0.303	1.132	-1.225	-1.856	-0.735	0.169	1.857	2.414	1.781	2.116
Significance	0.894	0.765	0.269	0.233	0.076	0.47	0.867	0.076	0.024	0.088	0.045
VIF	1.738	1.544	3.426	4.509	5.229	2.458	2.423	1.884	2.063	4.09	3.641

R-Squared	51.90%
Adjusted R Squared	28.90%
Regression Sig.	4.80%

Dependent Variable ICR

Table 4.2.2.1h

	DEbitdahat	DTNWRhat	CRhat	Inthat	CovNumhat	CRComp	ϬCFO	ϬTA	AQJones	CRAAQ	LAmount	Leverage	Growth
Beta Values	0.024	0.019	-1.443	0	1.7	0.069	-4.08	2.102	-0.794	1.843	0	-1.936	0.056
T Values	0.336	0.262	-1.229	0.061	1.595	0.339	-1.087	0.555	-0.569	0.79	2.027	-2.045	0.444
Significance	0.74	0.795	0.229	0.952	0.122	0.737	0.286	0.583	0.574	0.436	0.052	0.05	0.661
VIF	1.964	1.824	2.787	2.728	4.432	1.886	2.344	1.741	5.698	4.616	3.217	6.092	1.658

R-Squared	29.40%
Adjusted R Squared	0.00%
Regression Sig.	56.40%

CURRENT RATIO FINANCIAL COVENANT – MODIFIED JONES MODEL ANALYSIS

Current Ratio Covenant - Modified Jones Model - Descriptives - Table 4.2.2.2a

		CovThres	CRComp	ϬCFO	ϬTA	AQModJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	134	134	134	134	134	134	134	134	134	134	134	134	134	134
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.35	2.037	0.079	0.083	0.212	0.081	637,828	119.361	5.22	0.614	1.979	0.03	239.832	3.246
Median		1.25	1.835	0.068	0.058	0.109	0.015	396,141	104.499	5.327	0.514	1.557	0	200	3
Std. Deviation		0.312	1.251	0.047	0.133	0.255	0.134	1,359,755	61.12	1.445	0.476	2.014	0.171	87.065	1.072
Skewness		0.521	2.82	2.123	7.871	1.224	2.256	9	0.918	-0.085	5.518	2.033	5.588	1.863	0.645
Std. Error of Skewness		0.209	0.209	0.209	0.209	0.209	0.209	0	0.209	0.209	0.209	0.209	0.209	0.209	0.209
Kurtosis		-0.384	12.187	6.62	73.316	0.666	5.167	87	0.449	0.568	41.464	5.571	29.671	4.479	2.161
Std. Error of Kurtosis		0.416	0.416	0.416	0.416	0.416	0.416	0	0.416	0.416	0.416	0.416	0.416	0.416	0.416
Minimum		0.6	0.212	0.011	0.01	0	0	57,908	14.103	0.382	0.046	-1.579	0	100	1
Maximum		2	9.376	0.29	1.392	0.99	0.682	14,675,768	321.122	9.591	4.666	11.476	1	600	7
Percentiles	25	1.1	1.36	0.048	0.035	0	0	232,281	70.028	4.184	0.394	0.866	0	200	3
	50	1.25	1.835	0.068	0.058	0.109	0.015	396,141	104.499	5.327	0.514	1.557	0	200	3
	75	1.5	2.315	0.095	0.088	0.362	0.091	628,590	157.271	6.363	0.679	2.416	0	300	4

Current Ratio Covenant - Tests of Normality - Modified Jones Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.164	134	0	0.934	134	0
CRComp	0.172	134	0	0.763	134	0
ϬCFO	0.13	134	0	0.825	134	0
ϬTA	0.294	134	0	0.347	134	0
AQModJones	0.203	134	0	0.815	134	0
CRAAQ	0.271	134	0	0.665	134	0
LAmount	0.335	134	0	0.281	134	0
OpCycle	0.141	134	0	0.934	134	0
FirmSize	0.056	134	.200*	0.981	134	0.06
Leverage	0.234	134	0	0.54	134	0

Growth	0.175	134	0	0.822	134	0
Recession	0.54	134	0	0.16	134	0
Interest	0.37	134	0	0.709	134	0
CovNum	0.277	134	0	0.854	134	0

CR - Stage 1 of Two Stage Least Squares - Modified Jones Model

Dependent Variable: CovThres

	CRComp	ΔCFO	ΔTA	AQModJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.046	-0.31	-0.147	-0.058	0.033	0	0.002	-0.014	-0.202	-0.017	-0.299	0	0	0
T Values	2.173	-0.477	-0.706	-0.351	0.112	0.307	3.484	-0.679	-2.318	-1.349	-2.151	-2.472	0.718	1.144
Significance	0.032	0.634	0.482	0.726	0.911	0.759	0.001	0.499	0.022	0.18	0.034	0.015	0.474	0.255
VIF	1.398	1.85	1.5	3.49	3.149	2.264	1.387	1.673	3.373	1.279	1.111	1.229	2.382	1.2

R-Squared	37.70%
Adjusted R Squared	30.40%
Regression Sig.	0.00%
Breusch-Pagan Test	34.70%

Dependent Variable: Interest

	CRComp	ΔCFO	ΔTA	AQModJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	-2.745	47.44	-27.71	-4.98	-25.822	0	0.096	-24.351	69.165	6.525	58.624	0	0	0
T Values	-0.419	0.237	-0.434	-0.098	-0.28	-2.673	0.717	-3.922	2.582	1.675	1.37	1.969	-2.868	-0.977
Significance	0.676	0.813	0.665	0.922	0.78	0.009	0.475	0	0.011	0.097	0.173	0.051	0.005	0.33
VIF	1.398	1.85	1.5	3.49	3.149	2.264	1.387	1.673	3.373	1.279	1.111	1.229	2.382	1.2

R-Squared	24.50%
Adjusted R Squared	15.60%
Regression Sig.	0.01%

Dependent Variable: CovNum

	CRComp	ΔCFO	ΔTA	AQModJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	CRComp
Beta Values	0.035	0.94	-1.256	0.593	-1.468	0	0	0.095	0.072	0.032	-0.449	0	0	-0.115
T Values	0.393	0.348	-1.458	0.865	-1.183	0.599	-0.151	1.138	0.199	0.61	-0.778	-0.972	-1.022	-0.487
Significance	0.695	0.728	0.148	0.389	0.239	0.55	0.881	0.257	0.842	0.543	0.438	0.333	0.309	0.421
VIF	1.398	1.85	1.5	3.49	3.149	2.264	1.387	1.673	3.373	1.279	1.111	1.229	2.382	1.794

R-Squared	9.40%
Adjusted R Squared	0.00%
Regression Sig.	57.90%

Dependent Variable: ICR

	CRComp	ΔCFO	ΔTA	AQModJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0.11	-4.492	0.914	1.233	-0.837	0	-0.003	0.156	-1.332	0.109	-0.806
T Values	0.668	-1.176	0.262	1.076	-0.432	2.761	-1.165	1.257	-2.149	1.034	-0.913
Significance	0.509	0.249	0.795	0.291	0.669	0.01	0.253	0.218	0.04	0.309	0.369
VIF	1.345	2.661	1.613	4.174	3.7	4.167	1.836	2.26	2.854	1.242	1.134

R-Squared	30.90%
Adjusted R Squared	5.60%
Regression Sig.	31.50%

Dependent Variable: DEbitda

	CRComp	ΔCFO	ΔTA	AQModJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.724	-1.72	11.219	-3.146	3.426	0	-0.013	0.324	4.997	-0.141	-1.721	0
T Values	2.786	-0.275	2.208	-1.727	1.086	-2.325	-2.539	1.583	4.392	-1.34	-0.939	1.725
Significance	0.008	0.785	0.033	0.091	0.284	0.025	0.015	0.121	0	0.187	0.353	0.092
VIF	1.875	2.035	1.661	4.324	3.89	3.649	1.725	1.99	2.755	1.365	1.146	1.286

R-Squared	52.90%
Adjusted R Squared	39.40%
Regression Sig.	0.00%

Dependent Variable: DTNWR

	CRComp	ΔCFO	ΔTA	AQModJones	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	-0.492	6.301	34.585	-3.187	22.187	0	0.002	0.446	2.621	0.441	3.872	0
T Values	-0.447	0.338	2.532	-0.849	2.333	-0.384	0.185	0.696	0.905	1.438	1.303	1.163
Significance	0.659	0.738	0.019	0.405	0.029	0.704	0.855	0.494	0.375	0.165	0.206	0.257
VIF	3.016	3.627	1.928	2.565	2.696	8.62	1.616	2.889	6.362	1.634	1.183	1.373

R-Squared	57.70%
Adjusted R Squared	34.60%
Regression Sig.	3.00%

CR - Stage 2 of Two Stage Least Squares - Modified Jones Model

Dependent Variable: CovThres

Table 4.2.2.2b

	ICRhat	DEbitdaht	DTNWRhat	INThat	CovNumhat	CRComp	ϬCFO	ϬTA	AQModJones	CRAAQ	LAmount	OpCycle	Leverage	Growth	SIC2
Beta Values	0.032	0.003	0.032	0.005	1.309	0.019	-2.021	1.68	-0.788	2.01	0	0.001	-0.681	-0.096	0
T Values	1.422	0.237	2.508	2.276	3.056	0.781	-2.525	2.684	-2.799	2.856	1.306	3.251	-3.291	-2.926	2.969
Significance	0.158	0.813	0.014	0.025	0.003	0.436	0.013	0.008	0.006	0.005	0.194	0.001	0.001	0.004	0.004
VIF	1.213	1.174	1.236	20.353	41.87	1.892	2.998	14.589	10.848	18.676	2.662	1.605	20.433	9.218	38.23

R-Squared	42.40%
Adjusted R-Squared	35.00%
Regression Sig.	0.00%
Breusch-Pagan Test	28.40%

Pearson Correlations

	CovThres	ICRhat	DEbitdaht	DTNWRhat	INThat	CovNumhat	CRComp	ϬCFO	ϬTA	AQModJones	CRAAQ	LAmount	OpCycle	Leverage	Growth	SIC2
CovThres	1.000	.056	-.011	.135	-.094	.056	.397	-.185	-.151	-.057	.059	-.202	.401	-.309	-.052	-.096
ICRhat		1.000	.157	.096	-.184	.105	-.033	.136	-.054	-.008	.021	.137	-.100	.037	-.068	-.019
DEbitdahat			1.000	-.214	-.218	.122	.098	.113	.007	.017	.045	.117	-.082	.030	.069	.045
DTNWRhat				1.000	.295	-.093	-.071	.094	.052	.046	.037	.091	.014	.091	.077	-.023
INThat					1.000	-.433	-.060	-.001	.122	-.102	-.089	-.020	.230	.051	.169	-.174
CovNumhat						1.000	-.003	-.116	-.522	-.098	-.250	-.044	-.339	-.227	.212	-.405
CRComp							1.000	-.084	-.044	.015	.088	-.127	.270	-.351	.038	-.059
ϬCFO								1.000	.290	.204	.015	.499	-.026	.400	-.031	.384
ϬTA									1.000	.421	.202	.091	-.015	.072	-.013	.007
AQModJones										1.000	.766	-.044	.017	.042	.029	-.039
CRAAQ											1.000	-.040	.188	.086	.008	-.009
LAmount												1.000	-.122	.552	-.077	.275
OpCycle													1.000	-.078	-.174	.067
Leverage														1.000	-.244	.642
Growth															1.000	-.029
SIC2																1.000

Dependent Variable	Interest

Table 4.2.2.2c

	ICRhat	DEbitdaht	DTNWRhat	CRhat	CovNumhat	CRComp	ϬCFO	ϬTA	AQModJones	CRAAQ	SIC1	SIC2	SIC5
Beta Values	-7.068	-0.391	7.733	-53.644	-130.41	3.7	167.516	-180.31	46.926	-152.082	0	0	0
T Values	-0.953	-0.11	1.922	-0.806	-2.727	0.442	0.878	-1.897	0.781	-1.329	0.286	-2.35	1.013
Significance	0.342	0.913	0.057	0.422	0.007	0.659	0.382	0.06	0.437	0.186	0.776	0.02	0.313
VIF	1.168	1.172	1.124	3.117	4.748	2.105	1.551	3.066	4.504	4.496	2.233	2.428	1.39

R-Squared	17.60%
Adjusted R Squared	8.60%
Regression Sig.	2.90%

Dependent Variable	CovNum

Table 4.2.2.2d

	ICRhat	DEbitdaht	DTNWRhat	CRhat	Inthat	CRComp	ϬCFO	ϬTA	AQModJones	CRAAQ	Leverage	FirmSize	SIC1	SIC2	SIC5
Beta Values	0.304	0.169	0.255	0.432	0	-0.004	-1.894	-0.999	0.979	-2.477	0.029	0.104	0	0	0
T Values	3.912	4.715	5.819	0.582	-0.12	-0.045	-0.931	-1.47	1.79	-2.532	0.111	1.12	-0.199	-0.19	2.088
Significance	0	0	0	0.562	0.904	0.965	0.354	0.144	0.076	0.013	0.912	0.265	0.842	0.849	0.039
VIF	1.243	1.151	1.29	3.771	3.273	2.055	1.715	1.52	3.625	3.189	2.927	3.338	1.933	2.706	1.24

R-Squared	44.90%
Adjusted R-Squared	37.90%
Regression Sig.	0.00%

Dependent Variable	DEbitda

Table 4.2.2.2e

	ICRhat	DTNWRhat	CRhat	Inthat	CovNumhat	CRComp	ϬCFO	ϬTA	AQModJones	CRAAQ	OpCycle	FirmSize	Leverage	SIC2
Beta Values	0.258	0.181	11.156	0.028	-3.186	0.273	2.935	10.612	-0.452	-0.965	-0.032	1.339	5.802	0
T Values	1.028	0.592	2.503	2.222	-1.709	0.877	0.378	1.839	-0.211	-0.242	-3.175	3.793	5.004	1.131
Significance	0.31	0.557	0.016	0.032	0.095	0.386	0.708	0.073	0.834	0.81	0.003	0	0	0.265
VIF	1.486	1.494	13.157	4.645	5.042	2.655	3.09	2.113	5.892	6.157	6.837	5.844	2.823	3.141

R-Squared	54.50%
Adjusted R-Squared	38.60%
Regression Sig.	0.01%

Dependent Variable	DTNWR

Table 4.2.2.2f

	ICRhat	DEbitdaht	CRhat	Inthat	CovNumhat	CRComp	ϬCFO	ϬTA	AQModJones	CRAAQ	Leverage	SIC2
Beta Values	0.166	0.133	-0.508	0.026	4.853	-0.404	-4.453	37.355	-4.368	26.886	-0.644	0
T Values	0.276	0.348	-0.1	0.982	1.029	-0.408	-0.294	2.775	-0.889	2.201	-0.27	1.353
Significance	0.785	0.731	0.921	0.337	0.315	0.687	0.772	0.011	0.383	0.039	0.79	0.19
VIF	1.816	1.594	2.749	5.221	6.367	2.189	2.151	1.678	3.939	3.987	3.856	2.927

R-Squared	52.80%
Adjusted R Squared	27.00%
Regression Sig.	7.00%

Dependent Variable	ICR

Table 4.2.2.2g

	DEbitdahat	DTNWRhat	CRhat	Inthat	CovNumhat	CRComp	ΘCFO	ΘTA	AQModJones	CRAAQ	LAmount
Beta Values	-0.019	0.006	-1.51	-0.001	1.443	0.124	-1.753	2.235	-0.581	1.615	-0.871
T Values	-0.266	0.079	-1.351	-0.258	1.506	0.582	-0.489	0.579	-0.44	0.683	-1.187
Significance	0.792	0.937	0.187	0.799	0.142	0.565	0.628	0.567	0.663	0.5	0.245
VIF	1.794	1.651	2.353	2.248	3.318	1.895	1.99	1.683	4.709	4.683	3.405

R-Squared	18.80%
Adjusted R Squared	0.00%
Regression Sig.	78.90%

CURRENT RATIO FINANCIAL COVENANT – PEASNELL MODEL ANALYSIS

Current Ratio Covenant - Peasnell Model - Descriptives - Table 4.2.2.3a

		CovThres	CRComp	ΘCFO	ΘWCA	AQPeasnell	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	134	134	134	134	134	134	134	134	134	134	134	134	134	134
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.35	2.037	0.079	0.089	0.295	0.102	637,828	119.361	5.22	0.614	1.979	0.03	239.832	3.246
Median		1.25	1.835	0.068	0.056	0.251	0.052	396,141	104.499	5.327	0.514	1.557	0	200	3
Std. Deviation		0.312	1.251	0.047	0.128	0.288	0.134	1,359,755	61.12	1.445	0.476	2.014	0.171	87.065	1.072
Skewness		0.521	2.82	2.123	6.386	0.572	1.636	9	0.918	-0.085	5.518	2.033	5.588	1.863	0.645
Std. Error of Skewness		0.209	0.209	0.209	0.209	0.209	0.209	0	0.209	0.209	0.209	0.209	0.209	0.209	0.209
Kurtosis		-0.384	12.187	6.62	53.231	-0.881	2.397	87	0.449	0.568	41.464	5.571	29.671	4.479	2.161
Std. Error of Kurtosis		0.416	0.416	0.416	0.416	0.416	0.416	0	0.416	0.416	0.416	0.416	0.416	0.416	0.416
Minimum		0.6	0.212	0.011	0.013	0	0	57,908	14.103	0.382	0.046	-1.579	0	100	1
Maximum		2	9.376	0.29	1.258	0.984	0.587	14,675,768	321.122	9.591	4.666	11.476	1	600	7
Percentiles	25	1.1	1.36	0.048	0.035	0	0	232,281	70.028	4.184	0.394	0.866	0	200	3
	50	1.25	1.835	0.068	0.056	0.251	0.052	396,141	104.499	5.327	0.514	1.557	0	200	3
	75	1.5	2.315	0.095	0.105	0.545	0.169	628,590	157.271	6.363	0.679	2.416	0	300	4

Current Ratio Covenant - Tests of Normality - Peasnell Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.164	134	0	0.934	134	0
CRComp	0.172	134	0	0.763	134	0
ΘCFO	0.13	134	0	0.825	134	0
ΘWCA	0.276	134	0	0.45	134	0
AQPeasnell	0.182	134	0	0.881	134	0
CRAAQ	0.222	134	0	0.777	134	0
LAmount	0.335	134	0	0.281	134	0
OpCycle	0.141	134	0	0.934	134	0
FirmSize	0.056	134	.200*	0.981	134	0.06
Leverage	0.234	134	0	0.54	134	0
Growth	0.175	134	0	0.822	134	0
Recession	0.54	134	0	0.16	134	0
Interest	0.37	134	0	0.709	134	0
CovNum	0.277	134	0	0.854	134	0

CR - Stage 1 of Two Stage Least Squares - Peasnell Model

Dependent Variable: CovThres

	CRComp	ΘCFO	ΘWCA	AQPeasnell	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.046	-0.524	-0.188	-0.064	0.469	0	0.001	-0.01	-0.207	-0.019	-0.273	0	0	0
T Values	2.243	-0.856	-0.958	-0.535	1.911	0.586	3.349	-0.502	-2.471	-1.556	-2.01	-2.949	0.949	1.441
Significance	0.027	0.394	0.34	0.594	0.058	0.559	0.001	0.617	0.015	0.122	0.047	0.004	0.344	0.152
VIF	1.372	1.699	1.293	2.381	2.199	2.185	1.299	1.617	3.236	1.279	1.098	1.201	2.331	1.185

R-Squared	40.00%
Adjusted R Squared	32.90%
Regression Sig.	0.00%
Breusch-Pagan Test	39.90%

Dependent Variable: Interest

	CRComp	ΘCFO	ΘWCA	AQPeasnell	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5

R-Squared	24.50%

Beta Values	-3.177	35.756	-31.251	22.657	3.494	0	0.075	-24.134	65.872	6.404	63.026	0	0	0
T Values	-0.489	0.186	-0.507	0.609	0.045	-2.574	0.577	-3.955	2.512	1.644	1.481	1.946	-2.764	-0.934
Significance	0.626	0.852	0.613	0.544	0.964	0.011	0.565	0	0.013	0.103	0.141	0.054	0.007	0.352
VIF	1.372	1.699	1.293	2.381	2.199	2.185	1.299	1.617	3.236	1.279	1.098	1.201	2.331	1.185

Adjusted R Squared	15.60%
Regression Sig.	0.01%

Dependent Variable: CovNum

	CRComp	ΔCFO	ΔWCA	AQPeasnell	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.03	-0.421	0.519	-0.186	1.749	0	-0.001	0.132	0.003	0.025	-0.333	0	0	0
T Values	0.34	-0.164	0.627	-0.373	1.697	1.023	-0.684	1.613	0.007	0.487	-0.584	-1.551	-0.724	0.767
Significance	0.734	0.87	0.532	0.71	0.092	0.309	0.495	0.109	0.994	0.627	0.56	0.123	0.471	0.444
VIF	1.372	1.699	1.293	2.381	2.199	2.185	1.299	1.617	3.236	1.279	1.098	1.201	2.331	1.185

R-Squared	10.40%
Adjusted R Squared	0.00%
Regression Sig.	46.80%

Dependent Variable: ICR

	CRComp	ΔCFO	ΔWCA	AQPeasnell	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0.036	-3.844	1.674	-1.719	0.983	0	-0.004	0.175	-1.247	-0.007	-0.343
T Values	0.236	-1.295	1.014	-2.396	0.625	2.44	-1.801	1.6	-2.143	-0.069	-0.419
Significance	0.815	0.205	0.318	0.023	0.537	0.021	0.082	0.12	0.04	0.945	0.678
VIF	1.326	1.884	1.442	2.686	2.42	3.919	1.409	2.054	2.953	1.446	1.141

R-Squared	41.10%
Adjusted R Squared	19.60%
Regression Sig.	7.90%

Dependent Variable: DEbitda

	CRComp	ΔCFO	ΔWCA	AQPeasnell	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.931	-4.815	2.54	-1.439	1.528	0	-0.013	0.332	4.853	-0.15	-2.024	0
T Values	3.342	-0.78	0.638	-1.007	0.616	-1.918	-2.51	1.475	3.98	-1.332	-1.038	1.258
Significance	0.002	0.44	0.527	0.32	0.541	0.062	0.016	0.148	0	0.19	0.305	0.215
VIF	1.886	1.733	1.419	2.729	2.441	3.252	1.65	2.102	2.77	1.361	1.136	1.244

R-Squared	46.20%
Adjusted R Squared	30.80%
Regression Sig.	0.04%

Dependent Variable: DTNWR

	CRComp	ΔCFO	ΔWCA	AQPeasnell	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	1.552	31.423	-0.919	4.424	-4.592	0	-0.003	-0.242	8.94	0.25	2.039	0
T Values	1.162	1.304	-0.096	1.143	-0.671	-2.589	-0.224	-0.341	2.847	0.626	0.541	-0.187
Significance	0.258	0.206	0.924	0.265	0.509	0.017	0.825	0.737	0.009	0.538	0.594	0.854
VIF	2.926	3.997	2.082	3.461	2.887	5.76	1.728	2.34	4.924	1.829	1.256	1.205

R-Squared	35.80%
Adjusted R Squared	0.07%
Regression Sig.	46.50%

CR - Stage 2 of Two Stage Least Squares - Peasnell Model

Table 4.2.2.3b

Dependent Variable: CovThres

	ICRhat	DEbitdahat	DTNWRhat	INThat	CovNumhat	CRComp	ΔCFO	ΔWCA	AQPeasnell	CRAAQ	Recession	SIC1	SIC2
Beta Values	0.032	-0.002	0.031	-0.002	-0.47	0.076	-0.834	-0.027	-0.115	1.33	-0.262	0	0
T Values	1.329	-0.167	2.046	-2.234	-3.194	3.985	-1.472	-0.134	-0.94	3.924	-1.767	-3.982	-2.58
Significance	0.186	0.867	0.043	0.027	0.002	0	0.144	0.894	0.349	0	0.08	0	0.011
VIF	1.306	1.275	1.357	3.395	5.153	1.117	1.415	1.372	2.452	4.086	1.272	1.878	2.537

R-Squared	37.70%
Adjusted R Squared	31.00%
Regression Sig.	0.00%
Breusch-Pagan Test	8.50%

Pearson Correlations

	CovThres	ICRhat	DEbitdahat	DTNWRhat	INThat	CovNumhat	CRComp	ΔCFO	ΔWCA	AQPeasnell	CRAAQ	Recession	SIC1	SIC2
CovThres	1.000	.045	.004	.146	-.089	.098	.397	-.185	-.101	.108	.179	-.106	-.236	-.096
ICRhat		1.000	.181	.072	-.214	.012	-.033	.135	-.005	-.232	-.185	-.056	.095	-.021
DEbitdahat			1.000	-.202	-.188	.268	.099	.115	.037	.148	.169	-.081	-.057	.046
DTNWRhat				1.000	.353	-.070	-.078	.103	.054	.063	.133	.004	.020	-.026
INThat					1.000	-.430	-.060	-.001	.064	.163	.257	.246	.468	-.174
CovNumhat						1.000	-.003	-.110	.172	.320	.433	-.252	-.337	-.385
CRComp							1.000	-.084	.000	.067	.075	-.028	-.061	-.059
ΔCFO								1.000	.232	-.101	.006	.144	-.002	.384
ΔWCA									1.000	.338	.189	.111	.045	-.007
AQPeasnell										1.000	.702	.048	.000	-.076

CRAAQ											1.000	.030	.127	-.063
Recession												1.000	-.049	.070
SIC1													1.000	-.151
SIC2														1.000

Dependent Variable	**Interest**

Table 4.2.2.3c

	ICRhat	**DEbitdahat**	**DTNWRhat**	**CRhat**	**CovNumhat**	**CRComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**CRAAQ**	**OpCycle**	**SIC1**	**SIC2**	**SIC5**
Beta Values	-3.459	0.605	11.41	-206.139	-115.99	11.917	-137.684	-6.767	-19.919	297.959	0.227	0	0	0
T Values	-0.468	0.168	2.599	-2.011	-2.748	1.293	-0.734	-0.104	-0.518	2.534	1.07	-1.088	-2.406	1.797
Significance	0.641	0.867	0.011	0.047	0.007	0.198	0.464	0.917	0.605	0.013	0.287	0.279	0.018	0.075
VIF	1.292	1.267	1.21	8.548	4.476	2.783	1.637	1.447	2.558	5.187	3.515	3.355	1.988	1.48

R-Squared	25.10%
Adjusted R Squared	16.30%
Regression Sig.	0.01%

Dependent Variable	**CovNum**

Table 4.2.2.3d

	ICRhat	**DEbitdahat**	**DTNWRhat**	**CRhat**	**Inthat**	**CRComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**CRAAQ**	**Leverage**	**FirmSize**	**SIC1**	**SIC2**
Beta Values	0.324	0.137	0.253	-0.363	-0.005	0.006	-2.851	0.174	0.116	1.347	0.014	0	0	0
T Values	3.998	3.554	5.086	-0.507	-2.033	0.071	-1.457	0.259	0.281	1.414	0.347	-0.891	-1.066	1.949
Significance	0	0.001	0	0.613	0.044	0.943	0.148	0.796	0.779	0.16	0.73	0.374	0.289	0.054
VIF	1.331	1.255	1.323	3.562	1.839	2.191	1.522	1.331	2.504	2.909	1.164	1.994	1.327	1.226

R-Squared	42.20%
Adjusted R Squared	35.40%
Regression Sig.	0.00%

Dependent Variable	**DEbitda**

Table 4.2.2.3e

	ICRhat	**DTNWRhat**	**CRhat**	**Inthat**	**CovNumhat**	**CRComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**CRAAQ**	**LAmount**	**Growth**	**SIC2**
Beta Values	0.301	0.092	-6.84	0.032	6.626	0.904	-5.076	-2.069	-0.234	-7.641	0	-0.656	0
T Values	0.995	0.296	-2.937	2.19	3.488	2.662	-0.753	-0.465	-0.152	-2.009	-2.064	-3.74	2.974
Significance	0.326	0.768	0.005	0.034	0.001	0.011	0.456	0.644	0.88	0.051	0.045	0.001	0.005
VIF	1.686	1.439	3.138	4.866	6.05	2.444	1.806	1.551	2.764	5.016	2.095	2.893	3.796

R-Squared	39.90%
Adjusted R Squared	20.80%
Regression Sig.	3.60%

Dependent Variable	**DTNWR**

Table 4.2.2.3f

	ICRhat	**DEbitdahat**	**CRhat**	**Inthat**	**CovNumhat**	**CRComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**CRAAQ**	**SIC2**
Beta Values	0.908	-0.338	7.601	0.085	10.376	0.488	12.713	-4.106	4.464	-21.244	0
T Values	1.192	-0.754	1.114	2.101	2.018	0.51	0.749	-0.472	1.128	-1.646	1.343
Significance	0.245	0.459	0.277	0.047	0.055	0.615	0.461	0.641	0.271	0.113	0.192
VIF	2.062	1.775	3.193	9.403	6.988	1.487	1.966	1.707	3.588	10.199	2.798

R-Squared	32.30%
Adjusted R Squared	0.00%
Regression Sig.	47.90%

Dependent Variable	**ICR**

Table 4.2.2.3g

	DEbitdahat	**DTNWRhat**	**CRhat**	**Inthat**	**CovNumhat**	**CRComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**CRAAQ**	**Growth**
Beta Values	-0.065	-0.04	-1.597	-0.006	0.437	0.172	-4.122	1.569	-2.011	2.179	-0.024
T Values	-1.144	-0.55	-1.676	-1.309	0.683	0.926	-1.442	0.916	-2.775	1.152	-0.212
Significance	0.262	0.586	0.104	0.201	0.5	0.362	0.16	0.367	0.009	0.259	0.833
VIF	1.448	1.278	2.27	2.715	2.244	1.793	1.568	1.393	2.46	3.143	1.534

R-Squared	34.40%
Adjusted R Squared	10.30%
Regression Sig.	21.10%

CURRENT RATIO FINANCIAL COVENANT – DECHOW AND DICHEV (DD) MODEL ANALYSIS

Current Ratio Covenant - Dechow and Dichev (DD) Model - Descriptives - Table 4.2.2.4a

		CovThres	**CRComp**	**ϬCFO**	**ϬWC**	**AQDD**	**CRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	134	134	134	134	134	134	134	134	134	134	134	134	134	134
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.35	2.037	0.079	0.076	0.297	0.115	637,828	119.361	5.22	0.614	1.979	0.03	239.832	3.246
Median		1.25	1.835	0.068	0.058	0.197	0.033	396,141	104.499	5.327	0.514	1.557	0	200	3
Std. Deviation		0.312	1.251	0.047	0.065	0.308	0.161	1,359,755	61.12	1.445	0.476	2.014	0.171	87.065	1.072
Skewness		0.521	2.82	2.123	2.863	0.576	1.481	9	0.918	-0.085	5.518	2.033	5.588	1.863	0.645
Std. Error of Skewness		0.209	0.209	0.209	0.209	0.209	0.209	0	0.209	0.209	0.209	0.209	0.209	0.209	0.209
Kurtosis		-0.384	12.187	6.62	11.041	-1.063	1.257	87	0.449	0.568	41.464	5.571	29.671	4.479	2.161
Std. Error of Kurtosis		0.416	0.416	0.416	0.416	0.416	0.416	0	0.416	0.416	0.416	0.416	0.416	0.416	0.416
Minimum		0.6	0.212	0.011	0.014	0	0	57,908	14.103	0.382	0.046	-1.579	0	100	1
Maximum		2	9.376	0.29	0.446	0.984	0.607	14,675,768	321.122	9.591	4.666	11.476	1	600	7
	25	1.1	1.36	0.048	0.035	0	0	232,281	70.028	4.184	0.394	0.866	0	200	3

Percentiles	50	1.25	1.835	0.068	0.058	0.197	0.033	396,141	104.499	5.327	0.514	1.557	0	200	3
	75	1.5	2.315	0.095	0.095	0.563	0.188	628,590	157.271	6.363	0.679	2.416	0	300	4

Current Ratio Covenant - Tests of Normality - Dechow and Dichev Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.164	134	0	0.934	134	0
CRComp	0.172	134	0	0.763	134	0
ƃCFO	0.13	134	0	0.825	134	0
ƃWC	0.171	134	0	0.726	134	0
AQDD	0.198	134	0	0.851	134	0
CRAAQ	0.238	134	0	0.746	134	0
LAmount	0.335	134	0	0.281	134	0
OpCycle	0.141	134	0	0.934	134	0
FirmSize	0.056	134	.200*	0.981	134	0.06
Leverage	0.234	134	0	0.54	134	0
Growth	0.175	134	0	0.822	134	0
Recession	0.54	134	0	0.16	134	0
Interest	0.37	134	0	0.709	134	0
CovNum	0.277	134	0	0.854	134	0

CR - Stage 1 of Two Stage Least Squares - DD Model

Dependent Variable	CovThres													
	CRComp	ƃCFO	ƃWC	AQDD	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.047	-0.412	-0.242	-0.021	0.15	0	0.001	-0.013	-0.211	-0.017	-0.295	0	0	0
T Values	2.212	-0.64	-0.615	-0.163	0.608	0.412	3.515	-0.632	-2.452	-1.374	-2.103	-2.51	0.816	1.166
Significance	0.029	0.523	0.54	0.871	0.545	0.681	0.001	0.529	0.016	0.172	0.038	0.013	0.416	0.246
VIF	1.375	1.814	1.297	3.194	3.125	2.309	1.309	1.632	3.292	1.276	1.128	1.202	2.375	1.234

R-Squared	37.70%
Adjusted R Squared	30.40%
Regression Sig.	0.00%
Breusch-Pagan Test	20.90%

Dependent Variable	Interest													
	CRComp	ƃCFO	ƃWC	AQDD	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	-2.533	89.811	-131.469	-47.329	52.203	0	0.091	-24.399	69.233	6.283	61.743	0	0	0
T Values	-0.392	0.456	-1.093	-1.183	0.691	-2.626	0.703	-4.009	2.636	1.627	1.442	2.126	-2.95	-0.688
Significance	0.695	0.649	0.277	0.239	0.491	0.01	0.483	0	0.01	0.106	0.152	0.036	0.004	0.493
VIF	1.375	1.814	1.297	3.194	3.125	2.309	1.309	1.632	3.292	1.276	1.128	1.202	2.375	1.234

R-Squared	25.60%
Adjusted R Squared	16.80%
Regression Sig.	0.01%

Dependent Variable	CovNum													
	CRComp	ƃCFO	ƃWC	AQDD	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.024	-0.961	2.044	-0.139	-0.01	0	-0.001	0.131	-0.055	0.03	-0.19	0	0	0
T Values	0.277	-0.357	1.241	-0.255	-0.009	1.124	-0.442	1.574	-0.152	0.574	-0.324	-1.465	-0.677	0.469
Significance	0.782	0.722	0.217	0.799	0.992	0.263	0.659	0.118	0.88	0.567	0.747	0.146	0.5	0.64
VIF	1.375	1.814	1.297	3.194	3.125	2.309	1.309	1.632	3.292	1.276	1.128	1.202	2.375	1.234

R-Squared	8.10%
Adjusted R Squared	0.00%
Regression Sig.	72.20%

Dependent Variable	ICR										
	CRComp	ƃCFO	ƃWC	AQDD	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0.094	-2.124	-0.186	-0.408	-0.348	0	-0.003	0.186	-1.246	0.13	-0.518
T Values	0.554	-0.684	-0.09	-0.531	-0.259	2.587	-1.079	1.56	-2.032	1.205	-0.575
Significance	0.584	0.499	0.929	0.599	0.798	0.015	0.289	0.129	0.051	0.238	0.57
VIF	1.422	1.75	1.328	3.478	3.305	4.254	1.483	2.085	2.783	1.306	1.176

R-Squared	30.60%
Adjusted R Squared	5.10%
Regression Sig.	32.80%

Dependent Variable	DEbitda											
	CRComp	ƃCFO	ƃWC	AQDD	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.766	-7.607	12.199	0.23	1.51	0	-0.013	0.404	4.045	-0.164	-1.832	0
T Values	2.922	-1.359	2.444	0.166	0.552	-1.093	-2.486	1.934	3.618	-1.57	-0.994	2.112
Significance	0.006	0.181	0.019	0.869	0.584	0.281	0.017	0.06	0.001	0.124	0.326	0.041
VIF	1.908	1.629	1.508	3.409	3.432	3.659	1.933	2.08	2.664	1.347	1.162	1.365

R-Squared	53.00%
Adjusted R Squared	39.50%
Regression Sig.	0.00%

Dependent Variable	DTNWR

	CRComp	ΔCFO	ΔWC	AQDD	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	1.172	10.389	6.274	4.75	-3.688	0	-0.008	-0.698	7.904	0.323	1.163	0
T Values	0.991	0.408	0.66	1.317	-0.61	-2.338	-0.613	-0.976	2.585	0.844	0.325	-0.027
Significance	0.332	0.687	0.516	0.202	0.548	0.029	0.546	0.34	0.017	0.408	0.748	0.979
VIF	2.391	4.65	1.531	3.825	3.527	6.339	1.825	2.472	4.867	1.753	1.175	1.256

R-Squared	38.40%
Adjusted R-Squared	4.70%
Regression Sig.	37.90%

CR - Stage 2 of Two Stage Least Squares - DD Model

Dependent Variable	CovThres

Table 4.2.2.4b

	ICRhat	DEbitdahat	DTNWRhat	INThat	CovNumhat	CRComp	ΔCFO	ΔWC	AQDD	CRAAQ	OpCycle	Growth	SIC1	SIC2	SIC5
Beta Values	0.036	0.01	0.044	-0.004	-0.641	0.059	-0.732	0.33	-0.319	0.378	0.001	0.023	0	0	0
T Values	1.557	0.921	3.087	-3.147	-2.602	3.109	-1.323	0.654	-2.11	1.528	3.135	1.552	-2.424	-2.744	2.541
Significance	0.122	0.359	0.003	0.002	0.01	0.002	0.188	0.514	0.037	0.129	0.002	0.123	0.017	0.007	0.012
VIF	1.229	1.282	1.339	6.202	11.967	1.207	1.438	2.285	4.592	3.371	1.64	1.927	2.358	4.802	1.407

R-Squared	42.60%
Adjusted R-Squared	35.30%
Regression Sig.	0.00%
Breusch-Pagan Test	22.20%

Pearson Correlations

	CovThres	ICRhat	DEbitdahat	DTNWRhat	INThat	CovNumhat	CRComp	ΔCFO	ΔWC	AQDD	CRAAQ	OpCycle	Growth	SIC1	SIC2	SIC5
CovThres	1.000	.055	.007	.127	-.097	.008	.397	-.185	-.063	.051	.104	.401	-.052	-.236	-.096	.090
ICRhat		1.000	.178	.041	-.172	.167	-.033	.136	.088	-.137	-.097	-.100	-.068	.089	-.013	-.140
DEbitdahat			1.000	-.218	-.236	.276	.098	.113	.241	-.035	-.018	-.082	.069	-.045	.045	-.017
DTNWRhat				1.000	.293	-.114	-.077	.102	.151	.085	.078	.016	.083	.001	-.025	-.089
INThat					1.000	-.559	-.059	-.001	.054	-.151	-.026	.225	.165	.458	-.170	-.044
CovNumhat						1.000	-.004	-.125	.247	-.132	-.149	-.365	.228	-.383	-.437	.290
CRComp							1.000	-.084	.039	-.006	.022	.270	.038	-.061	-.059	.001
ΔCFO								1.000	.317	.050	.025	-.026	-.031	-.002	.384	-.104
ΔWC									1.000	-.027	.036	.061	.033	.150	-.011	.046
AQDD										1.000	.805	.069	-.040	-.032	.018	.172
CRAAQ											1.000	.163	-.018	-.048	.052	.044
OpCycle												1.000	-.174	-.065	.067	-.075
Growth													1.000	.033	-.029	.165
SIC1														1.000	-.151	-.098
SIC2															1.000	-.189
SIC5																1.000

Dependent Variable	Interest

Table 4.2.2.4c

	ICRhat	DEbitdahat	DTNWRhat	CRhat	CovNumhat	CRComp	ΔCFO	ΔWC	AQDD	CRAAQ	OpCycle	Growth	SIC1	SIC2	SIC5
Beta Values	-3.012	1.032	12.681	-188.308	-134.06	10.8	-91.996	63.475	-84.34	93.903	0.282	5.041	0	0	0
T Values	-0.424	0.297	2.926	-1.948	-2.991	1.2	-0.503	0.454	-2.136	1.247	1.38	1.359	-0.933	-2.805	1.652
Significance	0.672	0.767	0.004	0.054	0.003	0.232	0.616	0.651	0.035	0.215	0.17	0.177	0.353	0.006	0.101
VIF	1.223	1.278	1.267	7.514	4.107	2.783	1.634	1.825	3.242	3.238	3.428	1.227	3.092	2.255	1.374

R-Squared	29.20%
Adjusted R-Squared	20.20%
Regression Sig.	0.00%

Dependent Variable	CovNum

Table 4.2.2.4d

	ICRhat	DEbitdahat	DTNWRhat	CRhat	Inthat	CRComp	ΔCFO	ΔWC	AQDD	CRAAQ	SIC1	SIC2	SIC5
Beta Values	0.315	0.159	0.271	-0.114	-0.004	0.001	-1.893	-1.229	-0.349	0.266	0	0	0
T Values	3.97	4.155	5.483	-0.171	-1.689	0.006	-0.956	-0.918	-0.745	0.307	-0.489	-1.244	1.988
Significance	0	0	0	0.864	0.094	0.995	0.341	0.36	0.458	0.759	0.626	0.216	0.049
VIF	1.215	1.243	1.312	2.828	1.827	2.058	1.522	1.333	3.637	3.413	1.839	1.342	1.19

R-Squared	40.40%
Adjusted R-Squared	33.90%
Regression Sig.	0.00%

Dependent Variable	DEbitda

Table 4.2.2.4e

	ICRhat	DTNWRhat	CRhat	Inthat	CovNumhat	CRComp	ΔCFO	ΔWC	AQDD	CRAAQ	LAmount	Leverage	SIC2
Beta Values	0.141	0.193	-4.376	-0.022	-1.024	0.816	-8.664	11.9	-0.863	2.518	0	4.851	0
T Values	0.568	0.689	-2.169	-2.274	-0.711	2.736	-1.49	2.191	-0.572	0.894	-2.736	4.152	0.139

R-Squared	52.10%
Adjusted R-Squared	36.90%
Regression Sig.	0.01%

Significance	0.573	0.495	0.036	0.028	0.481	0.009	0.144	0.034	0.571	0.377	0.009	0	0.89
VIF	1.458	1.337	2.762	2.69	3.468	2.369	1.685	1.711	3.857	3.485	2.958	2.789	2.131

Dependent Variable **DTNWR**

Table 4.2.2.4f

	ICRhat	**DEbitdahat**	**CRhat**	**Inthat**	**CovNumhat**	**CRComp**	**ϭCFO**	**ϭWC**	**AQDD**	**CRAAQ**	**SIC2**
Beta Values	0.959	-0.108	4.049	0.083	8.981	0.22	-5.396	3.431	11.373	-10.895	0
T Values	1.357	-0.265	0.655	2.203	1.567	0.247	-0.319	0.308	2.392	-1.54	1.526
Significance	0.188	0.794	0.519	0.038	0.131	0.807	0.752	0.761	0.025	0.137	0.141
VIF	1.789	1.32	3.002	8.851	8.173	1.336	2.008	2.057	6.515	4.745	3.126

R-Squared	34.30%
Adjusted R Squared	2.90%
Regression Sig.	40.90%

Dependent Variable **ICR**

Table 4.2.2.4g

	DEbitdahat	**DTNWRhat**	**CRhat**	**Inthat**	**CovNumhat**	**CRComp**	**ϭCFO**	**ϭWC**	**AQDD**	**CRAAQ**	**LAmount**	**Leverage**	**Growth**
Beta Values	0.001	-0.001	-0.911	0.003	1.615	0.053	-1.446	-2.789	-0.138	-0.677	0	-1.882	0.094
T Values	0.013	-0.014	-0.882	0.516	1.687	0.251	-0.449	-1.05	-0.154	-0.444	2.194	-2.114	0.77
Significance	0.99	0.989	0.385	0.61	0.103	0.804	0.657	0.302	0.879	0.661	0.037	0.044	0.448
VIF	1.926	1.764	2.377	4.48	5.035	2.132	1.82	2.12	4.588	4.121	3.113	5.68	1.624

R-Squared	33.20%
Adjusted R Squared	2.10%
Regression Sig.	42.20%

CURRENT RATIO FINANCIAL COVENANT – MCNICHOLS MODEL ANALYSIS

Current Ratio Covenant - McNichols Model - Descriptives - Table 4.2.2.5a

		CovThres	**CRComp**	**ϭCFO**	**ϭWC**	**AQMcNichols**	**CRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	134	134	134	134	134	134	134	134	134	134	134	134	134	134
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.35	2.037	0.079	0.076	0.525	0.189	637,828	119.361	5.22	0.614	1.979	0.03	239.832	3.246
Median		1.25	1.835	0.068	0.058	0.556	0.118	396,141	104.499	5.327	0.514	1.557	0	200	3
Std. Deviation		0.312	1.251	0.047	0.065	0.361	0.196	1,359,755	61.12	1.445	0.476	2.014	0.171	87.065	1.072
Skewness		0.521	2.82	2.123	2.863	-0.247	1	9	0.918	-0.085	5.518	2.033	5.588	1.863	0.645
Std. Error of Skewness		0.209	0.209	0.209	0.209	0.209	0.209	0	0.209	0.209	0.209	0.209	0.209	0.209	0.209
Kurtosis		-0.384	12.187	6.62	11.041	-1.439	0.173	87	0.449	0.568	41.464	5.571	29.671	4.479	2.161
Std. Error of Kurtosis		0.416	0.416	0.416	0.416	0.416	0.416	0	0.416	0.416	0.416	0.416	0.416	0.416	0.416
Minimum		0.6	0.212	0.011	0.014	0	0	57,908	14.103	0.382	0.046	-1.579	0	100	1
Maximum		2	9.376	0.29	0.446	0.998	0.768	14,675,768	321.122	9.591	4.666	11.476	1	600	7
Percentiles	25	1.1	1.36	0.048	0.035	0.188	0.017	232,281	70.028	4.184	0.394	0.866	0	200	3
	50	1.25	1.835	0.068	0.058	0.556	0.118	396,141	104.499	5.327	0.514	1.557	0	200	3
	75	1.5	2.315	0.095	0.095	0.868	0.309	628,590	157.271	6.363	0.679	2.416	0	300	4

Current Ratio Covenant - Tests of Normality - McNichols Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.164	134	0	0.934	134	0
CRComp	0.172	134	0	0.763	134	0
ϭCFO	0.13	134	0	0.825	134	0
ϭWC	0.171	134	0	0.726	134	0
AQMcNichols	0.142	134	0	0.883	134	0
CRAAQ	0.167	134	0	0.869	134	0
LAmount	0.335	134	0	0.281	134	0
OpCycle	0.141	134	0	0.934	134	0
FirmSize	0.056	134	.200*	0.981	134	0.06
Leverage	0.234	134	0	0.54	134	0
Growth	0.175	134	0	0.822	134	0
Recession	0.54	134	0	0.16	134	0
Interest	0.37	134	0	0.709	134	0
CovNum	0.277	134	0	0.854	134	0

CR - Stage 1 of Two Stage Least Squares - McNichols Model

Dependent Variable	CovThres													
	CRComp	ΔCFO	ΔWC	AQMcNichols	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.046	-0.417	-0.231	0.039	-0.031	0	0.002	-0.013	-0.204	-0.017	-0.296	0	0	0
T Values	2.139	-0.644	-0.58	0.461	-0.198	0.389	3.692	-0.662	-2.378	-1.334	-2.114	-2.563	0.805	1.198
Significance	0.034	0.521	0.563	0.645	0.844	0.698	0	0.51	0.019	0.185	0.037	0.012	0.422	0.233
VIF	1.4	1.827	1.323	1.846	1.899	2.288	1.299	1.631	3.266	1.279	1.12	1.235	2.384	1.168

R-Squared	37.40%
Adjusted R Squared	30.10%
Regression Sig.	0.00%
Breusch-Pagan Test	21.30%

Dependent Variable	Interest													
	CRComp	ΔCFO	ΔWC	AQMcNichols	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	-2.276	74.51	-113.337	-15.28	5.952	0	0.088	-24.678	68.136	6.602	56.453	0	0	0
T Values	-0.348	0.375	-0.928	-0.586	0.122	-2.731	0.682	-4.037	2.592	1.699	1.317	2.113	-2.923	-1.051
Significance	0.729	0.708	0.355	0.559	0.903	0.007	0.497	0	0.011	0.092	0.19	0.037	0.004	0.295
VIF	1.4	1.827	1.323	1.846	1.899	2.288	1.299	1.631	3.266	1.279	1.12	1.235	2.384	1.168

R-Squared	24.90%
Adjusted R Squared	16.00%
Regression Sig.	0.01%

Dependent Variable	CovNum													
	CRComp	ΔCFO	ΔWC	AQMcNichols	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.004	-0.876	2.012	0.574	-0.419	0	-0.001	0.123	-0.07	0.028	-0.202	0	0	0
T Values	0.046	-0.328	1.224	1.635	-0.639	1.095	-0.404	1.493	-0.197	0.54	-0.35	-1.642	-0.583	0.456
Significance	0.964	0.743	0.223	0.105	0.524	0.276	0.687	0.138	0.844	0.59	0.727	0.103	0.561	0.649
VIF	1.4	1.827	1.323	1.846	1.899	2.288	1.299	1.631	3.266	1.279	1.12	1.235	2.384	1.168

R-Squared	10.20%
Adjusted R Squared	0.00%
Regression Sig.	49.20%

Dependent Variable	ICR										
	CRComp	ΔCFO	ΔWC	AQMcNichols	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0.098	-2.032	-0.052	0.041	0.373	0	-0.003	0.179	-1.232	0.089	-0.782
T Values	0.553	-0.636	-0.025	0.09	0.41	2.399	-1.403	1.511	-1.937	0.812	-0.867
Significance	0.584	0.529	0.981	0.929	0.684	0.023	0.171	0.141	0.062	0.423	0.393
VIF	1.49	1.772	1.315	1.613	1.596	3.931	1.422	1.961	2.868	1.278	1.127

R-Squared	27.60%
Adjusted R Squared	1.10%
Regression Sig.	43.90%

Dependent Variable	DEbitda											
	CRComp	ΔCFO	ΔWC	AQMcNichols	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.739	-7.246	11.973	-0.41	0.608	0	-0.011	0.398	4.214	-0.148	-1.604	0
T Values	2.795	-1.278	2.352	-0.5	0.412	-1.1	-2.188	1.888	3.726	-1.409	-0.864	1.964
Significance	0.008	0.208	0.023	0.62	0.682	0.277	0.034	0.066	0.001	0.166	0.392	0.056
VIF	1.896	1.631	1.53	1.779	1.971	3.66	1.694	2.064	2.658	1.33	1.147	1.4

R-Squared	51.80%
Adjusted R Squared	38.00%
Regression Sig.	0.01%

Dependent Variable	DTNWR											
	CRComp	ΔCFO	ΔWC	AQMcNichols	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	1.276	20.427	3.285	1.418	0.69	0	-0.004	-0.513	8.413	0.178	1.92	0
T Values	1.029	0.823	0.344	0.623	0.155	-2.322	-0.329	-0.696	2.605	0.423	0.528	-0.296
Significance	0.315	0.42	0.734	0.539	0.878	0.03	0.746	0.494	0.016	0.677	0.603	0.77
VIF	2.464	4.151	1.448	2.097	2.251	6.341	1.782	2.459	5.092	1.987	1.144	1.237

R-Squared	34.30%
Adjusted R Squared	0.00%
Regression Sig.	51.40%

CR - Stage 2 of Two Stage Least Squares - McNichols Model

Table 4.2.2.5b

Dependent Variable	CovThres														
	ICRhat	DEbitdahat	DTNWRhat	INThat	CovNumhat	CRComp	ΔCFO	ΔWC	AQMcNichols	CRAAQ	OpCycle	Leverage	LAmount	SIC1	SIC5
Beta Values	0.035	0.007	0.042	-0.001	-0.182	0.052	-0.828	-0.12	0.085	-0.06	0.002	-0.15	0	0	0
T Values	1.51	0.616	2.752	-1.793	-1.203	2.48	-1.281	-0.247	0.706	-0.364	3.69	-2.177	0.328	-1.663	1.904

R-Squared	40.90%
Adjusted R Squared	33.40%
Regression Sig.	0.00%

Significance	0.134	0.539	0.007	0.076	0.231	0.015	0.203	0.805	0.482	0.716	0	0.032	0.744	0.099	0.059
VIF	1.201	1.316	1.393	2.406	5.536	1.402	1.909	2.064	3.858	2.144	1.537	2.195	2.301	2.608	1.235

Breusch-Pagan Test	36.90%

Pearson Correlations

	CovThres	ICRhat	DEbitdahat	DTNWRhat	INThat	CovNumhat	CRComp	ΘCFO	ΘWC	AQMcNichols	CRAAQ	OpCycle	Leverage	LAmount	SIC1	SIC5
CovThres	1.000	.055	.001	.117	-.100	.029	.397	-.185	-.063	.057	.066	.401	-.309	-.202	-.236	.090
ICRhat		1.000	.177	.057	-.202	.146	-.034	.137	.089	.016	-.035	-.100	.037	.138	.083	-.128
DEbitdahat			1.000	-.221	-.261	.293	.098	.114	.241	.153	.137	-.083	.031	.117	-.050	-.014
DTNWRhat				1.000	.315	-.043	-.079	.104	.154	.099	.080	.016	.101	.101	.013	-.077
INThat					1.000	-.576	-.060	-.001	.054	-.082	-.021	.228	.051	-.020	.465	-.044
CovNumhat						1.000	-.003	-.112	.220	.492	.228	-.325	-.218	-.042	-.341	.258
CRComp							1.000	-.084	.039	.106	.034	.270	-.351	-.127	-.061	.001
ΘCFO								1.000	.317	-.076	-.065	-.026	.400	.499	-.002	-.104
ΘWC									1.000	.080	.151	.061	.046	.035	.150	.046
AQMcNichols										1.000	.652	.007	-.103	-.044	.081	-.032
CRAAQ											1.000	.117	-.051	-.056	-.040	-.041
OpCycle												1.000	-.078	-.122	-.065	-.075
Leverage													1.000	.552	-.015	-.052
LAmount														1.000	.187	-.015
SIC1															1.000	-.098
SIC5																1.000

Dependent Variable | **Interest**

Table 4.2.2.5c

	ICRhat	DEbitdahat	DTNWRhat	CRhat	CovNumhat	CRComp	ΘCFO	ΘWC	AQMcNichols	CRAAQ	OpCycle	SIC1	SIC2	SIC5
Beta Values	-3.971	1.846	14.119	-172.132	-126.01	8.831	-122.948	77.983	52.206	-38.807	0.261	0	0	0
T Values	-0.563	0.515	3.205	-1.743	-2.759	0.974	-0.663	0.555	1.384	-0.753	1.224	-0.844	-2.556	1.323
Significance	0.575	0.608	0.002	0.084	0.007	0.332	0.508	0.58	0.169	0.453	0.223	0.4	0.012	0.188
VIF	1.169	1.318	1.225	7.583	5.229	2.749	1.63	1.796	3.959	2.176	3.633	3.397	2.077	1.282

R-Squared	26.60%
Adjusted R Squared	17.90%
Regression Sig.	0.00%

Dependent Variable | **CovNum**

Table 4.2.2.5d

	ICRhat	DEbitdahat	DTNWRhat	CRhat	Inthat	CRComp	ΘCFO	ΘWC	AQMcNichols	CRAAQ	LAmount	Leverage	Growth	SIC1	SIC2	SIC5
Beta Values	0.3	0.163	0.281	-0.014	-0.005	-0.013	-0.928	-1.38	0.192	-0.234	0	0.061	0.017	0	0	0
T Values	3.778	4.08	5.408	-0.017	-1.71	-0.147	-0.409	-0.99	0.65	-0.438	-0.929	0.165	0.339	-0.161	-0.84	1.536
Significance	0	0	0	0.986	0.09	0.883	0.683	0.324	0.517	0.662	0.355	0.869	0.735	0.872	0.403	0.127
VIF	1.204	1.332	1.383	4.038	2.325	2.104	1.979	1.432	1.977	1.893	2.303	5.352	1.691	2.524	3.046	1.322

R-Squared	41.30%
Adjusted R Squared	33.30%
Regression Sig.	0.00%

Dependent Variable | **DEbitda**

Table 4.2.2.5e

	ICRhat	DTNWRhat	CRhat	Inthat	CovNumhat	CRComp	ΘCFO	ΘWC	AQMcNichols	CRAAQ	OpCycle	Leverage	SIC2
Beta Values	0.126	-0.027	-1.732	-0.019	-1.167	0.563	-14.621	15.488	0.16	0.138	-0.005	3.235	0
T Values	0.438	-0.088	-0.494	-1.699	-0.691	1.705	-2.486	2.546	0.133	0.077	-0.572	2.977	0.117
Significance	0.664	0.93	0.624	0.097	0.494	0.096	0.017	0.015	0.895	0.939	0.571	0.005	0.908
VIF	1.57	1.292	6.718	2.801	4.855	2.414	1.432	1.782	3.141	2.382	4.747	2.003	2.19

R-Squared	42.30%
Adjusted R Squared	24.00%
Regression Sig.	2.10%

Dependent Variable | **DTNWR**

Table 4.2.2.5f

	ICRhat	DEbitdahat	CRhat	Inthat	CovNumhat	CRComp	ΘCFO	ΘWC	AQMcNichols	CRAAQ	OpCycle	Leverage
Beta Values	0.987	-0.263	14.363	0.056	2.765	0.722	-7.001	12.818	2.092	-0.273	-0.028	4.699
T Values	1.312	-0.573	1.411	1.727	0.614	0.642	-0.383	1.201	0.635	-0.063	-1.337	1.489
Significance	0.203	0.573	0.172	0.098	0.545	0.527	0.705	0.243	0.532	0.95	0.195	0.151
VIF	1.818	1.523	7.663	6.019	7.035	1.972	2.189	1.76	4.29	2.071	4.449	4.732

R-Squared	32.50%
Adjusted R Squared	0.00%
Regression Sig.	57.60%

Dependent Variable | **ICR**

Table 4.2.2.5g

	DEbitdahat	DTNWRhat	CRhat	Inthat	CovNumhat	CRComp	ΘCFO	ΘWC	AQMcNichols	CRAAQ	LAmount	Growth
Beta Values	-0.047	-0.058	-0.961	-0.006	-0.057	0.218	-2.748	-0.16	0.212	0.292	0	0.138
T Values	-0.702	-0.646	-0.918	-1.076	-0.067	0.982	-0.787	-0.06	0.371	0.292	1.034	1.075
Significance	0.488	0.523	0.366	0.291	0.947	0.334	0.437	0.953	0.713	0.772	0.31	0.291

R-Squared	18.30%
Adjusted R Squared	0.00%
Regression Sig.	86.80%

VIF	1.563	1.448	2.004	3.254	4.215	1.999	1.815	1.834	2.213	1.654	2.072	1.513

CURRENT RATIO FINANCIAL COVENANT – FRANCIS MODEL

Current Ratio Covenant - Francis Model - Descriptives - Table 4.2.2.6a

		CovThres	CRComp	ϬCFO	ϬTCA	AQFrancis	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	134	134	134	134	134	134	134	134	134	134	134	134	134	134
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.35	2.037	0.079	0.066	0.439	0.142	637,828	119.361	5.22	0.614	1.979	0.03	239.832	3.246
Median		1.25	1.835	0.068	0.051	0.47	0.05	396,141	104.499	5.327	0.514	1.557	0	200	3
Std. Deviation		0.312	1.251	0.047	0.047	0.376	0.179	1,359,755	61.12	1.445	0.476	2.014	0.171	87.065	1.072
Skewness		0.521	2.82	2.123	1.467	0.054	1.294	9	0.918	-0.085	5.518	2.033	5.588	1.863	0.645
Std. Error of Skewness		0.209	0.209	0.209	0.209	0.209	0.209	0	0.209	0.209	0.209	0.209	0.209	0.209	0.209
Kurtosis		-0.384	12.187	6.62	1.985	-1.608	0.982	87	0.449	0.568	41.464	5.571	29.671	4.479	2.161
Std. Error of Kurtosis		0.416	0.416	0.416	0.416	0.416	0.416	0	0.416	0.416	0.416	0.416	0.416	0.416	0.416
Minimum		0.6	0.212	0.011	0.011	0	0	57,908	14.103	0.382	0.046	-1.579	0	100	1
Maximum		2	9.376	0.29	0.23	0.999	0.8	14,675,768	321.122	9.591	4.666	11.476	1	600	7
Percentiles	25	1.1	1.36	0.048	0.034	0	0	232,281	70.028	4.184	0.394	0.866	0	200	3
	50	1.25	1.835	0.068	0.051	0.47	0.05	396,141	104.499	5.327	0.514	1.557	0	200	3
	75	1.5	2.315	0.095	0.09	0.816	0.261	628,590	157.271	6.363	0.679	2.416	0	300	4

Current Ratio Covenant - Tests of Normality - Francis Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.164	134	0	0.934	134	0
CRComp	0.172	134	0	0.763	134	0
ϬCFO	0.13	134	0	0.825	134	0
ϬTCA	0.173	134	0	0.856	134	0
AQFrancis	0.195	134	0	0.854	134	0
CRAAQ	0.214	134	0	0.797	134	0
LAmount	0.335	134	0	0.281	134	0
OpCycle	0.141	134	0	0.934	134	0
FirmSize	0.056	134	.200*	0.981	134	0.06
Leverage	0.234	134	0	0.54	134	0
Growth	0.175	134	0	0.822	134	0
Recession	0.54	134	0	0.16	134	0
Interest	0.37	134	0	0.709	134	0
CovNum	0.277	134	0	0.854	134	0

CR - Stage 1 of Two Stage Least Squares - Francis Model

Dependent Variable	CovThres													
	CRComp	ϬCFO	ϬTCA	AQFrancis	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.047	-0.313	-0.369	-0.124	0.092	1.36E-08	0.002	-0.013	-0.205	-0.017	-0.27	-1.59E-07	3.68E-08	1.45E-07
T Values	2.243	-0.475	-0.659	-1.452	0.494	0.558	3.535	-0.684	-2.386	-1.367	-1.967	-2.621	0.595	1.094
Significance	0.027	0.636	0.511	0.149	0.622	0.578	0.001	0.495	0.019	0.174	0.051	0.01	0.553	0.276
VIF	1.39	1.93	1.407	2.07	2.25	2.188	1.366	1.617	3.333	1.315	1.101	1.196	2.384	1.161

R-Squared	38.80%
Adjusted R-Squared	31.60%
Regression Sig.	0.00%
Breusch-Pagan Test	36.40%

Dependent Variable	Interest													
	CRComp	ϬCFO	ϬTCA	AQFrancis	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	-3.075	-3.948	9.259	15.427	-21.763	-1.96E-05	0.097	-23.971	65.652	6.592	62.183	3.67E-05	-5.10E-05	-4.31E-05
T Values	-0.469	-0.019	0.053	0.58	-0.374	-2.586	0.728	-3.921	2.461	1.665	1.457	1.938	-2.647	-1.044
Significance	0.64	0.985	0.958	0.563	0.709	0.011	0.468	0	0.015	0.098	0.148	0.055	0.009	0.299
VIF	1.39	1.93	1.407	2.07	2.25	2.188	1.366	1.617	3.333	1.315	1.101	1.196	2.384	1.161

R-Squared	24.20%
Adjusted R-Squared	15.30%
Regression Sig.	0.02%

Dependent Variable	CovNum

	CRComp	ΔCFO	ΔTCA	AQFrancis	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC2	SIC5
Beta Values	0.039	-1.068	3.11	-0.117	-0.124	9.13E-08	-0.001	0.118	0.029	0.038	-0.288	-3.73E-07	-2.32E-07	2.23E-07
T Values	0.441	-0.385	1.319	-0.324	-0.158	0.891	-0.592	1.419	0.081	0.717	-0.498	-1.454	-0.89	0.399
Significance	0.66	0.701	0.19	0.747	0.875	0.375	0.555	0.159	0.936	0.475	0.619	0.149	0.375	0.691
VIF	1.39	1.93	1.407	2.07	2.25	2.188	1.366	1.617	3.333	1.315	1.101	1.196	2.384	1.161

R-Squared	8.20%
Adjusted R Squared	0.00%
Regression Sig.	71.20%

Dependent Variable	ICR

	CRComp	ΔCFO	ΔTCA	AQFrancis	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0.051	-1.277	-2.21	-0.535	1.983	2.93E-07	-0.004	0.211	-1.288	0.096	-0.571
T Values	0.317	-0.419	-0.771	-1.012	1.513	2.686	-1.515	1.703	-2.139	0.928	-0.648
Significance	0.753	0.678	0.447	0.319	0.141	0.012	0.14	0.099	0.041	0.361	0.522
VIF	1.308	1.746	1.253	2.328	2.434	3.741	1.413	2.332	2.782	1.243	1.166

R-Squared	33.20%
Adjusted R Squared	8.70%
Regression Sig.	24.50%

Dependent Variable	DEbitda

	CRComp	ΔCFO	ΔTCA	AQFrancis	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.707	-4.119	5.845	1.32	0.374	-4.77E-07	-0.015	0.305	4.28	-0.204	-1.732	1.26E-06
T Values	2.667	-0.756	0.975	1.357	0.177	-2.154	-2.924	1.446	3.712	-1.845	-0.93	1.905
Significance	0.011	0.454	0.335	0.182	0.86	0.037	0.006	0.156	0.001	0.072	0.357	0.064
VIF	1.873	1.481	1.296	2.555	2.684	3.374	1.608	2.037	2.722	1.452	1.137	1.367

R-Squared	51.00%
Adjusted R Squared	37.00%
Regression Sig.	0.01%

Dependent Variable	DTNWR

	CRComp	ΔCFO	ΔTCA	AQFrancis	CRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	1.185	38.932	1.641	3.515	-2.192	-1.85E-06	0.002	-0.03	10.439	0.393	1.992	-3.43E-07
T Values	0.929	1.271	0.074	1.298	-0.457	-2.908	0.135	-0.041	3.091	0.95	0.534	-0.136
Significance	0.363	0.217	0.942	0.208	0.652	0.008	0.894	0.967	0.005	0.353	0.599	0.893
VIF	2.732	6.626	2.848	2.924	2.406	7.452	2.263	2.451	5.838	2.009	1.261	1.189

R-Squared	37.30%
Adjusted R Squared	3.10%
Regression Sig.	41.30%

CR - Stage 2 of Two Stage Least Squares - Francis Model

Dependent Variable	CovThres

Table 4.2.2.6b

	ICRhat	DEbitdahat	DTNWRhat	INThat	CovNumhat	CRComp	ΔCFO	ΔTCA	AQFrancis	CRAAQ	LAmount	OpCycle	Leverage	SIC1	SIC5
Beta Values	0.026	0.006	0.045	-0.001	-0.135	0.056	-0.737	-0.096	-0.089	-0.001	9.23E-09	0.002	-0.146	-1.26E-07	2.39E-07
T Values	1.133	0.522	3.172	-1.824	-1.061	2.838	-1.101	-0.146	-1.071	-0.005	0.403	3.635	-2.228	-1.613	1.823
Significance	0.26	0.603	0.002	0.071	0.291	0.005	0.273	0.884	0.286	0.996	0.688	0	0.028	0.109	0.071
VIF	1.226	1.151	1.312	2.299	3.222	1.297	2.117	2.056	2.087	2.201	2.065	1.696	2.067	2.087	1.204

R-Squared	42.90%
Adjusted R Squared	35.60%
Regression Sig.	0.00%
Breusch-Pagan Test	38.90%

Pearson Correlations

	CovThres	ICRhat	DEbitdahat	DTNWRhat	INThat	CovNumhat	CRComp	ΔCFO	ΔTCA	AQFrancis	CRAAQ	LAmount	OpCycle	Leverage	SIC1	SIC5
CovThres	1.000	.056	.003	.135	-.115	.026	.397	-.185	-.091	-.153	-.045	-.202	.401	-.309	-.236	.090
ICRhat		1.000	.150	.078	-.200	.166	-.033	.136	.072	-.151	-.112	.137	-.100	.037	.081	-.126
DEbitdahat			1.000	-.174	-.209	.199	.098	.114	.091	.045	.044	.117	-.083	.031	-.055	-.015
DTNWRhat				1.000	.344	-.112	-.078	.102	.121	.054	.097	.100	.016	.100	.021	-.099
INThat					1.000	-.538	-.061	-.001	.154	.194	.219	-.020	.231	.052	.471	-.045
CovNumhat						1.000	-.004	-.125	.159	-.142	-.252	-.047	-.363	-.243	-.380	.288
CRComp							1.000	-.084	-.017	.031	.086	-.127	.270	-.351	-.061	.001
ΔCFO								1.000	.462	.138	.215	.499	-.026	.400	-.002	-.104
ΔTCA									1.000	.175	.222	.175	.139	.088	.132	-.031
AQFrancis										1.000	.687	.114	-.014	.043	.036	-.019
CRAAQ											1.000	.107	.175	.122	.033	.000
LAmount												1.000	-.122	.552	.187	-.015
OpCycle													1.000	-.078	-.065	-.075
Leverage														1.000	-.015	-.052
SIC1															1.000	-.098
SIC5																1.000

Dependent Variable	Interest

Table 4.2.2.6c

	ICRhat	DEbitdahat	DTNWRhat	CRhat	CovNumhat	CRComp	ΘCFO	ΘTCA	AQFrancis	CRAAQ	LAmount	FirmSize	Leverage	SIC1	SIC5
Beta Values	-1.708	-0.048	10.889	-10.18	26.43	-4.181	-10.665	-80.294	18.756	-2.228	-1.84E-05	-22.047	16.292	5.31E-05	-1.25E-05
T Values	-0.23	-0.014	2.339	-0.126	0.442	-0.47	-0.045	-0.338	0.603	-0.038	-1.713	-2.069	0.582	1.58	-0.245
Significance	0.819	0.989	0.021	0.9	0.659	0.639	0.964	0.736	0.547	0.97	0.089	0.041	0.562	0.117	0.807
VIF	1.237	1.15	1.328	4.963	6.776	2.499	2.482	2.559	2.75	2.228	4.301	4.781	3.579	3.675	1.722

R-Squared	22.80%
Adjusted R-Squared	13.00%
Regression Sig.	0.06%

Dependent Variable: CovNum

Table 4.2.2.6d

	ICRhat	DEbitdahat	DTNWRhat	CRhat	Inthat	CRComp	ΘCFO	ΘTCA	AQFrancis	CRAAQ	LAmount	Growth	SIC1	SIC2	SIC5
Beta Values	0.282	0.16	0.267	-0.174	-0.005	-0.001	-2.288	1.128	0.148	-0.423	-5.62E-08	0.016	-1.11E-07	-1.45E-07	7.65E-07
T Values	3.508	4.285	5.354	-0.248	-1.856	-0.016	-1.001	0.594	0.462	-0.665	-0.799	0.389	-0.416	-0.883	1.68
Significance	0.001	0	0	0.805	0.066	0.987	0.319	0.553	0.645	0.507	0.426	0.698	0.678	0.379	0.096
VIF	1.229	1.153	1.298	3.208	1.9	2.181	1.993	1.389	2.487	2.227	1.572	1.169	1.967	1.445	1.169

R-Squared	40.30%
Adjusted R-Squared	32.70%
Regression Sig.	0.00%

Dependent Variable: DEbitda

Table 4.2.2.6e

	ICRhat	DTNWRhat	CRhat	Inthat	CovNumhat	CRComp	ΘCFO	ΘTCA	AQFrancis	CRAAQ	OpCycle	Leverage
Beta Values	0.444	-0.55	-1.141	-0.014	-1.255	0.564	-14.89	6.09	1.963	-0.364	-0.012	2.928
T Values	1.614	-1.906	-0.33	-1.449	-1.007	1.657	-2.458	0.794	1.617	-0.155	-1.341	2.82
Significance	0.114	0.064	0.743	0.155	0.32	0.105	0.018	0.432	0.113	0.877	0.187	0.007
VIF	1.403	1.342	6.469	2.002	2.207	2.536	1.501	1.742	3.26	2.705	4.011	1.808

R-Squared	40.20%
Adjusted R-Squared	23.10%
Regression Sig.	2.00%

Dependent Variable: DTNWR

Table 4.2.2.6f

	ICRhat	DEbitdahat	CRhat	Inthat	CovNumhat	CRComp	ΘCFO	ΘTCA	AQFrancis	CRAAQ	OpCycle	Leverage
Beta Values	0.744	-0.373	10.372	0.038	1.945	0.788	-14.651	16.157	1.513	2.161	-0.026	4.257
T Values	0.948	-0.764	0.875	1.116	0.457	0.596	-0.523	0.603	0.531	0.411	-1.072	1.268
Significance	0.353	0.453	0.391	0.277	0.652	0.557	0.606	0.553	0.601	0.685	0.295	0.218
VIF	1.732	2.135	8.78	5.326	3.329	2.428	4.575	3.446	2.677	2.39	5.162	4.773

R-Squared	24.20%
Adjusted R-Squared	0.00%
Regression Sig.	83.10%

Dependent Variable: ICR

Table 4.2.2.6g

	DEbitdahat	DTNWRhat	CRhat	Inthat	CovNumhat	CRComp	ΘCFO	ΘTCA	AQFrancis	CRAAQ	LAmount	Leverage
Beta Values	0.032	0.022	-1.598	0.001	1.341	0.03	-0.71	-7.2	-0.799	2.26	2.27E-07	-2.03
T Values	0.49	0.298	-1.609	0.125	1.546	0.148	-0.207	-1.892	-1.431	1.6	2.127	-2.335
Significance	0.628	0.768	0.118	0.901	0.133	0.883	0.838	0.068	0.163	0.121	0.042	0.027
VIF	1.674	1.384	2.26	4.333	3.593	1.95	2.135	2.127	2.503	2.722	3.451	5.587

R-Squared	32.90%
Adjusted R-Squared	5.10%
Regression Sig.	34.00%

INTEREST COVERAGE RATIO FINANCIAL COVENANT – JONES MODEL ANALYSIS

Interest Coverage Ratio Covenant - Jones Model - Descriptives - Table 4.2.3.1a

		CovThres	ICRComp	ΘCFO	ΘTA	AQJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	567	567	567	567	567	567	567	567	567	567	567	567	567	567
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.456	3.267	0.054	0.065	0.236	0.092	754,185	125.681	6.768	0.685	3.512	0.039	205.864	2.679
Median		2.25	2.066	0.044	0.043	0.123	0.019	395,439	106.987	6.831	0.658	1.81	0	200	3
Std. Deviation		0.981	55.098	0.047	0.12	0.276	0.145	3,364,593	94.039	1.659	0.285	23.716	0.193	61.253	0.949
Skewness		1.062	6.706	6.64	14.003	0.966	1.993	16	4.999	-0.222	1.511	20.038	4.789	9.139	0.655
Std. Error of Skewness		0.103	0.103	0.103	0.103	0.103	0.103	0	0.103	0.103	0.103	0.103	0.103	0.103	0.103
Kurtosis		2.426	164.847	79.775	250.858	-0.213	3.489	265	50.261	0.125	5.53	453.975	21.008	129.744	0.641
Std. Error of Kurtosis		0.205	0.205	0.205	0.205	0.205	0.205	0	0.205	0.205	0.205	0.205	0.205	0.205	0.205
Minimum		-0.3	-556.642	0.006	0.007	0	0	5,791	0.713	0.382	0.066	-97.094	0	100	1
Maximum		7	921.279	0.726	2.373	0.995	0.734	61,631,003	1316.473	11.322	2.412	536.733	1	1200	7
Percentiles	25	1.75	0.481	0.029	0.028	0	0	216,185	71.315	5.583	0.509	0.965	0	200	2
	50	2.25	2.066	0.044	0.043	0.123	0.019	395,439	106.987	6.831	0.658	1.81	0	200	3
	75	3	4.654	0.068	0.07	0.421	0.109	663,520	158.979	7.845	0.795	3.229	0	200	3

Interest Coverage Ratio Covenant - Tests of Normality - Francis Model - Table 4.2.3.1b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.122	567	0	0.935	567	0
ICRComp	0.373	567	0	0.211	567	0
ΔCFO	0.166	567	0	0.601	567	0
ΔTA	0.32	567	0	0.269	567	0
AQJones	0.196	567	0	0.823	567	0
ICRAAQ	0.263	567	0	0.687	567	0
LAmount	0.412	567	0	0.103	567	0
OpCycle	0.12	567	0	0.697	567	0
FirmSize	0.038	567	0.046	0.993	567	0.015
Leverage	0.105	567	0	0.909	567	0
Growth	0.367	567	0	0.132	567	0
Recession	0.541	567	0	0.189	567	0
Interest	0.482	567	0	0.268	567	0
CovNum	0.255	567	0	0.872	567	0

ICR - Stage 1 of Two Stage Least Squares - Jones Model

Dependent Variable: CovThres

	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-0.107	-0.181	-0.134	-0.194	0	0	0.11	-0.92	0	-0.011	0	0	0	0
T Values	-0.04	-0.109	-0.516	-0.577	-0.437	-1.35	-0.025	3.959	-6.179	-0.059	-0.055	1.667	-2.431	-0.46	2.484
Significance	0.968	0.914	0.606	0.564	0.662	0.178	0.98	0	0	0.953	0.956	0.096	0.015	0.645	0.013
VIF	1.022	1.392	1.151	2.654	2.691	1.073	1.099	1.387	1.172	1.03	1.01	1.023	1.101	1.071	1.238

R-Squared	12.10%
Adjusted R Squared	9.70%
Regression Sig.	0.00%
Breusch-Pagan Test	6.20%

Dependent Variable: Interest

	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	-0.003	80.904	-16.863	-6.591	-3.885	0	0.078	-6.663	13.821	-0.014	8.481	0	0	0	0
T Values	-0.064	1.279	-0.752	-0.445	-0.137	-0.913	2.787	-3.743	1.45	-0.133	0.651	2.461	-0.622	0.202	-0.697
Significance	0.949	0.201	0.452	0.656	0.891	0.362	0.006	0	0.148	0.894	0.516	0.014	0.534	0.84	0.486
VIF	1.022	1.392	1.151	2.654	2.691	1.073	1.099	1.387	1.172	1.03	1.01	1.023	1.101	1.071	1.238

R-Squared	7.60%
Adjusted R Squared	5.10%
Regression Sig.	0.00%

Dependent Variable: CovNum

	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-0.543	-0.072	-0.201	0.883	0	0	-0.249	0.196	0.001	-0.157	0	0	0	0
T Values	0.101	-0.593	-0.223	-0.937	2.145	-0.956	-1.07	-9.637	1.417	0.835	-0.83	-0.826	2.592	0.386	-0.36
Significance	0.919	0.554	0.824	0.349	0.032	0.339	0.285	0	0.157	0.404	0.407	0.409	0.01	0.699	0.719
VIF	1.022	1.392	1.151	2.654	2.691	1.073	1.099	1.387	1.172	1.03	1.01	1.023	1.101	1.071	1.238

R-Squared	19.10%
Adjusted R Squared	16.90%
Regression Sig.	0.00%

Dependent Variable: CR

	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4
Beta Values	-0.003	-0.91	-1.454	-0.151	0.253	0	-0.001	-0.152	-0.052	-0.021	-0.33	0
T Values	-0.815	-0.59	-0.829	-0.352	0.288	-1.577	-0.966	-2.703	-0.205	-0.451	-0.798	-1.017
Significance	0.42	0.559	0.412	0.727	0.775	0.124	0.341	0.01	0.839	0.655	0.43	0.316
VIF	1.163	2.152	1.849	2.843	2.97	3.52	1.615	2.52	2.309	1.241	1.09	1.422

R-Squared	29.40%
Adjusted R Squared	5.80%
Regression Sig.	29.10%

Dependent Variable: LR

	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0	0.011	-0.044	-0.055	0.098	0	0	-0.001	0.318	-0.01	-0.07
T Values	-0.581	0.018	-0.082	-0.759	0.735	-1.501	-0.393	-0.077	3.606	-3.931	-1.181
Significance	0.563	0.986	0.935	0.45	0.465	0.137	0.695	0.939	0.001	0	0.241
VIF	1.351	2.355	2.493	2.625	2.482	1.127	1.213	1.345	1.474	1.103	1.068

R-Squared	30.90%
Adjusted R Squared	21.80%
Regression Sig.	0.01%

Dependent Variable: DEbitda

	ICRComb	ΔCFO	ΔTA	AQJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5	SIC7
Beta Values	-0.002	-1.845	0.222	0.328	0.178	0	0	-0.035	1.381	-0.006	-0.438	0	0	0
T Values	-1.713	-1.119	0.423	0.626	0.174	1.312	0.33	-0.528	4.642	-0.744	-1.027	2.673	1.888	-2.1
Significance	0.088	0.264	0.673	0.532	0.862	0.191	0.742	0.598	0	0.457	0.306	0.008	0.06	0.037
VIF	1.046	1.391	1.16	3.323	3.35	4.772	1.103	1.68	1.363	1.055	1.015	1.289	1.136	4.155

R-Squared	17.30%
Adjusted R-Squared	13.00%
Regression Sig.	0.00%

ICR - Stage 2 of TWO STAGE LEAST SQUARES - Jones Model

Table 4.2.3.1c

Dependent Variable	CovThres

	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	Growth	Leverage	SIC1	SIC4	SIC5	SIC7
Beta Values	-0.299	0.48	0.029	0	-0.373	0	0.057	-0.275	-0.178	0.119	0.001	-0.806	0	0	0	0
T Values	-2.955	2.516	1.514	0.04	-2.28	-0.049	0.052	-0.769	-0.766	0.251	0.325	-5.457	1.396	-1.444	-0.534	2.048
Significance	0.003	0.012	0.131	0.968	0.023	0.961	0.959	0.442	0.444	0.802	0.745	0	0.163	0.149	0.593	0.041
VIF	1.156	1.192	1.201	3.99	3.07	1.024	1.774	1.227	2.726	3.118	1.055	1.178	1.631	1.613	1.092	1.273

R-Squared	14.00%
Adjusted R-Squared	11.50%
Regression Sig.	0.00%
Breusch-Pagan Test	5.46%

Pearson Correlations

	CovThres	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	Growth	Leverage	SIC1	SIC4	SIC5	SIC7
CovThres	1.000	-.116	.148	-.021	-.079	-.220	.005	-.078	-.077	-.080	-.100	-.018	-.237	.070	-.144	-.036	-.002
CRhat		1.000	.032	-.057	.317	.193	.007	.213	.009	-.034	-.061	-.024	-.066	.166	-.070	-.032	.063
LRhat			1.000	-.360	-.113	-.182	.042	-.066	-.069	.015	-.013	-.019	-.142	.049	-.062	-.067	-.055
DEbitdahat				1.000	.095	.160	-.018	.078	.079	-.062	-.025	-.051	.102	-.063	.032	.126	.048
Inthat					1.000	.531	-.022	.459	.030	-.211	-.226	-.033	.019	.404	-.148	.065	.088
CovNumhat						1.000	-.003	.326	.187	.098	.201	.093	.072	-.011	.308	.083	.185
ICRComp							1.000	-.023	-.013	.055	-.024	-.009	-.041	.002	.003	.065	-.017
ΔCFO								1.000	.267	.022	-.073	-.009	.023	.017	.070	.155	.242
ΔTA									1.000	.178	.135	-.025	.034	.007	-.007	-.001	.025
AQJones										1.000	.775	-.049	.054	.017	.096	.010	-.043
ICRAAQ											1.000	-.044	.142	-.017	.122	-.026	-.039
Growth												1.000	.019	-.009	.153	-.014	-.013
Leverage													1.000	-.068	.091	.014	.242
SIC1														1.000	-.041	-.040	-.025
SIC4															1.000	-.064	-.040
SIC5																1.000	-.039
SIC7																	1.000

Table 4.2.3.1d

Dependent Variable	Interest

	CRhat	LRhat	DEbitdahat	ICRhat	CovNumhat	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	Growth	SIC1	SIC4	SIC5	SIC7
Beta Values	30.011	-6.495	-1.022	-10.878	14.873	-0.006	67.771	-13.732	-7.262	-19.979	-0.029	0	0	0	0
T Values	4.646	-0.533	-0.847	-1.005	1.73	-0.124	1.094	-0.615	-0.49	-0.694	-0.274	2.007	-1.591	0.05	-0.534
Significance	0	0.595	0.397	0.315	0.084	0.901	0.274	0.539	0.624	0.488	0.784	0.045	0.112	0.96	0.594
VIF	1.151	1.19	1.199	2.207	2.067	1.024	1.364	1.166	2.713	2.822	1.043	1.107	1.299	1.084	1.126

R-Squared	9.50%
Adjusted R-Squared	7.00%
Regression Sig.	0.00%

Table 4.2.3.1e

Dependent Variable	CovNum

	CRhat	LRhat	DEbitdahat	ICRhat	Inthat	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	OpCycle	Growth	SIC4	SIC5	SIC7
Beta Values	0.848	0.334	0.096	-0.364	0.011	0	-1.833	0.309	-0.115	0.751	-0.001	0.002	0	0	0
T Values	9.611	1.999	5.847	-2.711	3.534	0.173	-1.958	1.002	-0.571	1.93	-2.491	1.394	2.591	0.377	1.457
Significance	0	0.046	0	0.007	0	0.863	0.051	0.317	0.569	0.054	0.013	0.164	0.01	0.707	0.146
VIF	1.15	1.192	1.195	1.819	2.593	1.023	1.663	1.186	2.682	2.757	1.616	1.037	1.428	1.099	1.095

R-Squared	29.50%
Adjusted R-Squared	27.50%
Regression Sig.	0.00%

Table 4.2.3.1f

Dependent Variable	CR

	LRhat	DEbitdahat	ICRhat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	LAmount	OpCycle	Growth	SIC4
Beta Values	-0.081	0.066	0.271	-0.007	1.101	-0.002	-1.536	-1.145	0.128	-0.581	0	0	-0.013	0

R-Squared	50.80%
Adjusted R-Squared	30.50%

T Values	-0.355	2.417	1.052	-1.986	4.166	-0.785	-1.152	-0.769	0.345	-0.797	-2.81	0.607	-0.324	-2.13
Significance	0.725	0.021	0.3	0.055	0	0.438	0.257	0.447	0.732	0.431	0.008	0.548	0.748	0.04
VIF	1.347	1.461	2.213	2.506	3.426	1.196	2.187	1.812	2.902	2.762	2.244	1.813	1.267	1.517

Regression Sig.	1.40%

Table 4.2.3.1g

Dependent Variable	LR

	CRhat	DEbitdahat	ICRhat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	FirmSize	Growth
Beta Values	0.049	-0.008	-0.157	0.004	0.44	0	-0.341	0.07	0.045	-0.284	0.155	-0.013
T Values	1.831	-0.853	-2.19	2.696	3.482	-0.756	-0.535	0.137	0.619	-1.722	4.871	-4.795
Significance	0.071	0.396	0.031	0.008	0.001	0.452	0.594	0.891	0.538	0.089	0	0
VIF	1.187	1.371	2.78	3.685	16.586	1.415	2.756	2.498	2.92	4.178	17.298	1.629

R-Squared	38.10%
Adjusted R-Squared	29.10%
Regression Sig.	0.00%

Table 4.2.3.1h

Dependent Variable	DEbitda

	CRhat	LRhat	ICRhat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTA	AQJones	ICRAAQ	Leverage	SIC4	SIC5
Beta Values	0.231	0.137	-1.324	0	-0.311	-0.002	-2.384	0.059	0.143	0.066	0.246	0	0
T Values	1.035	0.179	-2.079	-0.032	-0.873	-1.784	-1.363	0.105	0.262	0.062	0.475	1.73	1.836
Significance	0.301	0.858	0.039	0.975	0.383	0.076	0.174	0.916	0.794	0.951	0.635	0.085	0.067
VIF	1.132	1.044	7.241	2.071	2.988	1.07	1.562	1.33	3.577	3.683	4.108	1.786	1.147

R-Squared	16.80%
Adjusted R-Squared	12.80%
Regression Sig.	0.00%

INTEREST COVERAGE RATIO FINANCIAL COVENANT – MODIFIED JONES MODEL ANALYSIS

Interest Coverage Ratio Covenant- Modified Jones Model - Descriptives - Table 4.2.3.2a

		CovThres	ICRComp	ΔCFO	ΔTA	AQModJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	567	567	567	567	567	567	567	567	567	567	567	567	567	567
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.456	3.267	0.054	0.065	0.221	0.086	754,185	125.681	6.768	0.685	3.512	0.039	205.864	2.679
Median		2.25	2.066	0.044	0.043	0.098	0.012	395,439	106.987	6.831	0.658	1.81	0	200	3
Std. Deviation		0.981	55.098	0.047	0.12	0.271	0.142	3,364,593	94.039	1.659	0.285	23.716	0.193	61.253	0.949
Skewness		1.062	6.706	6.64	14.003	1.089	2.18	16	4.999	-0.222	1.511	20.038	4.789	9.139	0.655
Std. Error of Skewness		0.103	0.103	0.103	0.103	0.103	0.103	0	0.103	0.103	0.103	0.103	0.103	0.103	0.103
Kurtosis		2.426	164.847	79.775	250.858	0.11	4.648	265	50.261	0.125	5.53	453.975	21.008	129.744	0.641
Std. Error of Kurtosis		0.205	0.205	0.205	0.205	0.205	0.205	0	0.205	0.205	0.205	0.205	0.205	0.205	0.205
Minimum		-0.3	-556.642	0.006	0.007	0	0	5,791	0.713	0.382	0.066	-97.094	0	100	1
Maximum		7	921.279	0.726	2.373	0.995	0.755	61,631,003	1316.473	11.322	2.412	536.733	1	1200	7
Percentiles	25	1.75	0.481	0.029	0.028	0	0	216,185	71.315	5.583	0.509	0.965	0	200	2
	50	2.25	2.066	0.044	0.043	0.098	0.012	395,439	106.987	6.831	0.658	1.81	0	200	3
	75	3	4.654	0.068	0.07	0.397	0.105	663,520	158.979	7.845	0.795	3.229	0	200	3

Interest Coverage Ratio Covenant - Tests of Normality - Modified Jones Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.122	567	0	0.935	567	0
ICRComp	0.373	567	0	0.211	567	0
ΔCFO	0.166	567	0	0.601	567	0
ΔTA	0.32	567	0	0.269	567	0
AQModJones	0.207	567	0	0.805	567	0
ICRAAQ	0.273	567	0	0.664	567	0
LAmount	0.412	567	0	0.103	567	0
OpCycle	0.12	567	0	0.697	567	0
FirmSize	0.038	567	0.046	0.993	567	0.015
Leverage	0.105	567	0	0.909	567	0
Growth	0.367	567	0	0.132	567	0
Recession	0.541	567	0	0.189	567	0
Interest	0.482	567	0	0.268	567	0
CovNum	0.255	567	0	0.872	567	0

ICR - Stage 1 of Two Stage Least Squares - Modified Jones Model

Dependent Variable	CovThres

	ICRComp	ΔCFO	ΔTA	AQModJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-0.133	-0.147	-0.143	-0.348	0	0	0.11	-0.905	0	-0.009	0	0	0	0

R-Squared	12.40%
Adjusted R-Squared	10.00%

T Values	-0.008	-0.135	-0.419	-0.607	-0.77	-1.34	-0.081	3.968	-6.087	-0.101	-0.046	1.555	-2.382	-0.495	2.442
Significance	0.994	0.893	0.676	0.544	0.442	0.181	0.936	0	0	0.92	0.964	0.121	0.018	0.621	0.015
VIF	1.021	1.391	1.154	2.673	2.697	1.072	1.099	1.386	1.172	1.031	1.01	1.023	1.099	1.071	1.239

Regression Sig.	0.00%
Breusch-Pagan Test	17.70%

Dependent Variable: Interest

	ICRCom	ΔCFO	ΔTA	AQModJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	-0.002	82.716	-16.913	-8.016	-0.086	0	0.078	-6.661	13.798	-0.014	8.392	0	0	0	0
T Values	-0.039	1.308	-0.753	-0.53	-0.003	-0.9	2.792	-3.742	1.447	-0.131	0.644	2.405	-0.639	0.194	-0.704
Significance	0.969	0.191	0.452	0.596	0.998	0.368	0.005	0	0.148	0.896	0.52	0.016	0.523	0.847	0.482
VIF	1.021	1.391	1.154	2.673	2.697	1.072	1.099	1.386	1.172	1.031	1.01	1.023	1.099	1.071	1.239

R-Squared	7.60%
Adjusted R-Squared	5.10%
Regression Sig.	0.00%

Dependent Variable: CovNum

	ICRCom	ΔCFO	ΔTA	AQModJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-0.588	-0.094	-0.122	0.825	0	0	-0.249	0.194	0.001	-0.157	0	0	0	0
T Values	0.009	-0.642	-0.288	-0.559	1.962	-0.976	-1.045	-9.663	1.408	0.854	-0.832	-0.789	2.58	0.4	-0.334
Significance	0.992	0.521	0.773	0.576	0.05	0.329	0.297	0	0.16	0.394	0.406	0.43	0.01	0.689	0.739
VIF	1.021	1.391	1.154	2.673	2.697	1.072	1.099	1.386	1.172	1.031	1.01	1.023	1.099	1.071	1.239

R-Squared	19.20%
Adjusted R-Squared	17.00%
Regression Sig.	0.00%

Dependent Variable: CR

	ICRCom	ΔCFO	ΔTA	AQModJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4
Beta Values	-0.002	-1.33	-1.38	0.032	0.258	0	0	-0.157	-0.062	-0.021	-0.327	0
T Values	-0.711	-0.828	-0.788	0.076	0.291	-1.429	-0.93	-2.771	-0.246	-0.452	-0.793	-0.946
Significance	0.482	0.413	0.436	0.94	0.773	0.162	0.359	0.009	0.807	0.654	0.433	0.35
VIF	1.169	2.343	1.852	2.72	2.936	3.637	1.577	2.59	2.333	1.259	1.089	1.42

R-Squared	29.60%
Adjusted R-Squared	6.20%
Regression Sig.	28.20%

Dependent Variable: LR

	ICRCom	ΔCFO	ΔTA	AQModJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0	0.072	-0.112	-0.125	0.236	0	0	-0.001	0.34	-0.01	-0.072
T Values	-0.134	0.117	-0.211	-1.65	1.652	-1.56	-0.339	-0.068	3.868	-4.139	-1.227
Significance	0.894	0.907	0.833	0.103	0.102	0.123	0.736	0.946	0	0	0.223
VIF	1.419	2.348	2.525	2.72	2.541	1.127	1.203	1.343	1.511	1.116	1.065

R-Squared	32.80%
Adjusted R-Squared	24.10%
Regression Sig.	0.00%

Dependent Variable: DEbitda

	ICRCom	ΔCFO	ΔTA	AQModJones	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5	SIC7
Beta Values	-0.002	-1.888	0.195	0.393	0.187	0	0	-0.036	1.368	-0.006	-0.425	0	0	0
T Values	-1.776	-1.143	0.371	0.722	0.178	1.342	0.333	-0.547	4.59	-0.742	-0.997	2.697	1.895	-2.112
Significance	0.077	0.254	0.711	0.471	0.859	0.181	0.739	0.585	0	0.459	0.32	0.007	0.059	0.036
VIF	1.046	1.4	1.164	3.398	3.403	4.772	1.1	1.68	1.369	1.054	1.015	1.288	1.134	4.152

R-Squared	17.40%
Adjusted R-Squared	13.20%
Regression Sig.	0.00%

ICR - Stage 2 of Two Stage Least Squares - Modified Jones Model

Dependent Variable: CovThres

Table 4.2.3.2b

	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTA	AQModJones	ICRAAQ	Growth	Leverage	SIC1	SIC4	SIC5	SIC7
Beta Values	-0.297	0.478	0.029	0	-0.367	0	0.027	-0.253	-0.146	-0.097	0	-0.789	0	0	0	0
T Values	-2.94	2.51	1.546	-0.015	-2.242	-0.057	0.024	-0.708	-0.615	-0.204	0.283	-5.342	1.385	-1.42	-0.569	2.001
Significance	0.003	0.012	0.123	0.988	0.025	0.955	0.981	0.479	0.539	0.838	0.777	0	0.167	0.156	0.57	0.046
VIF	1.157	1.192	1.197	4.009	3.081	1.023	1.794	1.223	2.75	3.011	1.056	1.181	1.596	1.617	1.093	1.279

R-Squared	14.30%
Adjusted R-Squared	11.80%
Regression Sig.	0.00%
Breusch-Pagan Test	13.50%

Pearson Correlations

	CovThres	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTA	AQModJones	ICRAAQ	Growth	Leverage	SIC1	SIC4	SIC5	SIC7
CovThres	1.000	-.115	.148	-.021	-.077	-.226	.005	-.078	-.077	-.108	-.129	-.018	-.237	.070	-.144	-.036	-.002
CRhat		1.000	.032	-.057	.317	.192	.007	.213	.009	-.034	-.063	-.024	-.066	.169	-.070	-.032	.063

LRhat			1.000	-.359	-.112	-.181	.042	-.066	-.069	-.005	-.019	-.019	-.142	.048	-.062	-.066	-.055
DEbitdahat				1.000	.091	.161	-.018	.078	.079	-.029	.000	-.051	.102	-.065	.032	.126	.048
Inthat					1.000	.531	-.022	.459	.030	-.228	-.219	-.033	.019	.404	-.148	.066	.088
CovNumhat						1.000	-.003	.326	.187	.135	.220	.093	.072	-.011	.308	.083	.185
ICRComp							1.000	-.023	-.013	.068	-.005	-.009	-.041	.002	.003	.065	-.017
ϬCFO								1.000	.267	.031	-.064	-.009	.023	.017	.070	.155	.242
ϬTA									1.000	.189	.142	-.025	.034	.007	-.007	-.001	.025
AQModJones										1.000	.777	-.053	.076	-.052	.098	.003	-.043
ICRAAQ											1.000	-.046	.155	-.052	.122	-.032	-.037
Growth												1.000	.019	-.009	.153	-.014	-.013
Leverage													1.000	-.068	.091	.014	.242
SIC1														1.000	-.041	-.040	-.025
SIC4															1.000	-.064	-.040
SIC5																1.000	-.039
SIC7																	1.000

Table 4.2.3.2c

Dependent Variable	**Interest**

	CRhat	**LRhat**	**DEbitdahat**	**ICRhat**	**CovNumhat**	**ICRComp**	**ϬCFO**	**ϬTA**	**AQModJones**	**ICRAAQ**	**Growth**	**SIC1**	**SIC4**	**SIC5**	**SIC7**
Beta Values	29.44	-6.535	-1.01	-11.296	14.823	-0.003	71.094	-13.152	-11.044	-15.781	-0.031	0	0	0	0
T Values	4.553	-0.536	-0.837	-1.025	1.718	-0.058	1.148	-0.589	-0.734	-0.535	-0.287	1.92	-1.62	0.02	-0.549
Significance	0	0.592	0.403	0.306	0.086	0.953	0.251	0.556	0.464	0.593	0.774	0.055	0.106	0.984	0.583
VIF	1.152	1.189	1.195	2.341	2.082	1.023	1.361	1.163	2.702	2.845	1.043	1.103	1.292	1.084	1.127

R-Squared	9.40%
Adjusted R-Squared	6.90%
Regression Sig.	0.00%

Table 4.2.3.2d

Dependent Variable	**CovNum**

	CRhat	**LRhat**	**DEbitdahat**	**ICRhat**	**Inthat**	**ICRComp**	**ϬCFO**	**ϬTA**	**AQModJones**	**ICRAAQ**	**Growth**	**SIC1**	**SIC4**	**SIC7**
Beta Values	0.87	0.352	0.096	-0.319	0.011	0	-1.863	0.381	-0.03	0.66	0.002	0	0	0
T Values	9.898	2.109	5.875	-2.165	3.308	0.095	-1.99	1.231	-0.143	1.641	1.315	-2.189	2.876	1.64
Significance	0	0.035	0	0.031	0.001	0.924	0.047	0.219	0.886	0.101	0.189	0.029	0.004	0.102
VIF	1.14	1.191	1.181	2.241	2.612	1.017	1.665	1.197	2.776	2.828	1.036	1.604	1.51	1.078

R-Squared	29.30%
Adjusted R-Squared	27.50%
Regression Sig.	0.00%

Table 4.2.3.2e

Dependent Variable	**CR**

	LRhat	**DEbitdahat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ϬCFO**	**ϬTA**	**AQModJones**	**ICRAAQ**	**LAmount**	**OpCycle**	**Growth**	**SIC4**
Beta Values	-0.083	0.065	0.28	-0.007	1.108	-0.002	-1.551	-1.099	0.064	-0.443	0	0	-0.014	0
T Values	-0.369	2.407	1.058	-2.036	4.176	-0.743	-1.137	-0.738	0.176	-0.603	-2.828	0.622	-0.343	-2.129
Significance	0.714	0.022	0.298	0.05	0	0.463	0.263	0.466	0.861	0.551	0.008	0.538	0.734	0.041
VIF	1.341	1.451	2.364	2.391	3.443	1.19	2.287	1.813	2.745	2.719	2.248	1.722	1.286	1.514

R-Squared	50.80%
Adjusted R-Squared	30.60%
Regression Sig.	1.40%

Table 4.2.3.2f

Dependent Variable	**LR**

	CRhat	**DEbitdahat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ϬCFO**	**ϬTA**	**AQModJones**	**ICRAAQ**	**Growth**	**FirmSize**
Beta Values	0.05	-0.009	-0.174	0.004	0.457	0	-0.305	0.034	-0.057	-0.175	-0.014	0.163
T Values	1.894	-0.997	-2.434	2.869	3.71	-0.098	-0.485	0.067	-0.781	-1.097	-5.032	5.18
Significance	0.062	0.322	0.017	0.005	0	0.922	0.629	0.947	0.437	0.276	0	0
VIF	1.189	1.355	3.013	3.669	16.579	1.445	2.775	2.514	2.825	3.539	1.661	17.545

R-Squared	40.30%
Adjusted R-Squared	31.70%
Regression Sig.	0.00%

Table 4.2.3.2g

Dependent Variable	**DEbitda**

	CRhat	**LRhat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ϬCFO**	**ϬTA**	**AQModJones**	**ICRAAQ**	**LAmount**	**SIC4**	**SIC5**
Beta Values	0.241	0.102	-1.636	0	-0.529	-0.002	-2.873	0.004	0.13	-0.042	0	0	0
T Values	1.093	0.135	-4.875	-0.025	-1.67	-1.809	-1.594	0.007	0.239	-0.039	1.113	1.666	1.786
Significance	0.275	0.893	0	0.98	0.096	0.072	0.112	0.994	0.811	0.969	0.267	0.097	0.075
VIF	1.116	1.045	2.054	2.115	2.364	1.066	1.667	1.205	3.4	3.648	1.36	1.551	1.109
R-Squared	17.20%												
Adjusted R-Squared	13.30%												
Regression Sig.	0.00%												

INTEREST COVERAGE RATIO FINANCIAL COVENANT – PEASNELL MODEL ANALYSIS

Interest Coverage Ratio Covenant - Peasnell Model - Descriptives - Table 4.2.3.3a

	CovThres	**ICRComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**ICRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**

N	Valid	567	567	567	567	567	567	567	567	567	567	567	567	567	567
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.456	3.267	0.054	0.081	0.305	0.103	754,185	125.681	6.768	0.685	3.512	0.039	205.864	2.679
Median		2.25	2.066	0.044	0.046	0.185	0.036	395,439	106.987	6.831	0.658	1.81	0	200	3
Std. Deviation		0.981	55.098	0.047	0.249	0.323	0.15	3,364,593	94.039	1.659	0.285	23.716	0.193	61.253	0.949
Skewness		1.062	6.706	6.64	18.318	0.645	2.061	16	4.999	-0.222	1.511	20.038	4.789	9.139	0.655
Std. Error of Skewness		0.103	0.103	0.103	0.103	0.103	0.103	0	0.103	0.103	0.103	0.103	0.103	0.103	0.103
Kurtosis		2.426	164.847	79.775	384.718	-0.996	5.139	265	50.261	0.125	5.53	453.975	21.008	129.744	0.641
Std. Error of Kurtosis		0.205	0.205	0.205	0.205	0.205	0.205	0	0.205	0.205	0.205	0.205	0.205	0.205	0.205
Minimum		-0.3	-556.642	0.006	0.004	0	0	5,791	0.713	0.382	0.066	-97.094	0	100	1
Maximum		7	921.279	0.726	5.438	1	0.916	61,631,003	1316.473	11.322	2.412	536.733	1	1200	7
Percentiles	25	1.75	0.481	0.029	0.027	0	0	216,185	71.315	5.583	0.509	0.965	0	200	2
	50	2.25	2.066	0.044	0.046	0.185	0.036	395,439	106.987	6.831	0.658	1.81	0	200	3
	75	3	4.654	0.068	0.082	0.568	0.155	663,520	158.979	7.845	0.795	3.229	0	200	3

Interest Coverage Ratio - Tests of Normality - Peasnell Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.122	567	0	0.935	567	0
ICRComp	0.373	567	0	0.211	567	0
ϭCFO	0.166	567	0	0.601	567	0
ϭWCA	0.38	567	0	0.16	567	0
AQPeasnell	0.185	567	0	0.843	567	0
ICRAAQ	0.245	567	0	0.728	567	0
LAmount	0.412	567	0	0.103	567	0
OpCycle	0.12	567	0	0.697	567	0
FirmSize	0.038	567	0.046	0.993	567	0.015
Leverage	0.105	567	0	0.909	567	0
Growth	0.367	567	0	0.132	567	0
Recession	0.541	567	0	0.189	567	0
Interest	0.482	567	0	0.268	567	0
CovNum	0.255	567	0	0.872	567	0

ICR - Stage 1 of Two Stage Least Squares - Peasnell Model

Dependent Variable: CovThres

	ICRComp	ϭCFO	ϭWCA	AQPeasnell	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-0.034	-0.097	-0.385	0.808	0	0	0.113	-0.954	0	-0.005	0	0	0	0
T Values	0.09	-0.035	-0.581	-2.127	2.069	-1.498	0.355	4.063	-6.503	-0.019	-0.022	1.586	-2.557	-0.379	2.585
Significance	0.928	0.972	0.561	0.034	0.039	0.135	0.723	0	0	0.985	0.982	0.113	0.011	0.705	0.01
VIF	1.015	1.347	1.14	2.239	2.236	1.107	1.09	1.384	1.145	1.028	1.021	1.023	1.092	1.07	1.243

R-Squared	12.50%
Adjusted R-Squared	10.10%
Regression Sig.	0.00%
Breusch-Pagan Test	37.30%

Dependent Variable: Interest

	ICRComp	ϭCFO	ϭWCA	AQPeasnell	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	-0.001	76.977	-1.775	-3.129	-23.503	0	0.084	-6.522	12.495	-0.012	10.331	0	0	0	0
T Values	-0.028	1.239	-0.165	-0.27	-0.939	-0.578	3.005	-3.67	1.328	-0.111	0.789	2.509	-0.812	0.181	-0.747
Significance	0.978	0.216	0.869	0.787	0.348	0.564	0.003	0	0.185	0.911	0.43	0.012	0.417	0.856	0.455
VIF	1.015	1.347	1.14	2.239	2.236	1.107	1.09	1.384	1.145	1.028	1.021	1.023	1.092	1.07	1.243

R-Squared	7.90%
Adjusted R-Squared	5.40%
Regression Sig.	0.00%

Dependent Variable: CovNum

	ICRComp	ϭCFO	ϭWCA	AQPeasnell	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-0.833	0.034	0.014	-0.227	0	-0.001	-0.249	0.242	0.001	-0.132	0	0	0	0
T Values	-0.045	-0.92	0.217	0.085	-0.623	-0.841	-1.245	-9.615	1.767	0.695	-0.691	-0.843	2.79	0.303	-0.488
Significance	0.964	0.358	0.828	0.932	0.534	0.401	0.214	0	0.078	0.487	0.49	0.399	0.005	0.762	0.626
VIF	1.015	1.347	1.14	2.239	2.236	1.107	1.09	1.384	1.145	1.028	1.021	1.023	1.092	1.07	1.243

R-Squared	18.40%
Adjusted R-Squared	16.20%
Regression Sig.	0.00%

Dependent Variable: CR

	ICRComp	ϭCFO	ϭWCA	AQPeasnell	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4
Beta Values	-0.003	-0.535	-1.261	0.262	-0.192	0	0	-0.137	-0.081	-0.015	-0.382	0
T Values	-0.903	-0.382	-1.413	0.735	-0.161	-1.502	-0.82	-2.752	-0.326	-0.325	-0.919	-1.349

R-Squared	32.20%
Adjusted R-Squared	9.60%
Regression Sig.	20.00%

Significance	0.373	0.705	0.166	0.467	0.873	0.142	0.418	0.009	0.746	0.747	0.364	0.186
VIF	1.161	1.855	1.713	3.181	2.719	3.505	1.451	2.072	2.333	1.274	1.149	1.105

Dependent Variable	LR										
	ICRCom	ΔCFO	ΔWCA	AQPeasnell	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0	0.007	-0.125	-0.039	0.11	0	0	0	0.322	-0.01	-0.066
T Values	-0.785	0.015	-0.377	-0.636	0.978	-1.31	-0.201	0.052	3.681	-4.006	-1.111
Significance	0.435	0.988	0.707	0.527	0.331	0.194	0.841	0.958	0	0	0.27
VIF	1.222	1.445	1.57	2.957	2.601	1.164	1.311	1.393	1.457	1.097	1.091

R-Squared	31.20%
Adjusted R-Squared	22.20%
Regression Sig.	0.01%

Dependent Variable	DEbitda													
	ICRCom	ΔCFO	ΔWCA	AQPeasnell	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5	SIC7
Beta Values	-0.002	-1.426	-0.054	0.21	-1.025	0	0	-0.039	1.418	-0.007	-0.394	0	0	0
T Values	-1.591	-0.879	-0.216	0.57	-1.203	1.499	0.05	-0.592	4.831	-0.86	-0.907	2.472	1.691	-2.39
Significance	0.113	0.38	0.829	0.569	0.23	0.135	0.96	0.554	0	0.39	0.365	0.014	0.092	0.018
VIF	1.032	1.343	1.209	2.374	2.283	4.858	1.145	1.678	1.324	1.054	1.052	1.301	1.136	4.268

R-Squared	17.10%
Adjusted R-Squared	12.80%
Regression Sig.	0.00%

ICR - Stage 2 of Two Stage Least Squares - Peasnell Model

Table 4.2.3.3b

Dependent Variable	CovThres												
	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔWCA	AQPeasnell	ICRAAQ	Leverage	Growth	SIC5
Beta Values	-0.262	0.476	0.032	0.005	-0.518	0	-0.036	-0.093	-0.349	0.608	-0.778	0	0
T Values	-2.58	2.485	1.668	1.499	-4.255	0.052	-0.037	-0.557	-1.945	1.563	-5.584	0.204	-0.575
Significance	0.01	0.013	0.096	0.134	0	0.958	0.971	0.578	0.052	0.119	0	0.838	0.566
VIF	1.158	1.195	1.199	1.847	1.618	1.017	1.383	1.138	2.215	2.23	1.04	1.031	1.052

R-Squared	12.80%
Adjusted R-Squared	10.80%
Regression Sig.	0.00%
Breusch-Pagan Test	23.70%

Pearson Correlations

	CovThres	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔWCA	AQPeasnell	ICRAAQ	Leverage	Growth	SIC5
CovThres	1.000	-.118	.148	-.020	-.092	-.219	.005	-.078	-.059	-.023	.028	-.237	-.018	-.036
CRhat		1.000	.029	-.055	.327	.206	.007	.213	.008	-.038	-.089	-.066	-.024	-.032
LRhat			1.000	-.362	-.116	-.189	.042	-.066	-.055	.000	.038	-.142	-.019	-.068
DEbitdahat				1.000	.102	.172	-.018	.079	.047	-.033	-.073	.102	-.051	.126
Inthat					1.000	.568	-.022	.452	.087	-.150	-.192	.018	-.032	.065
CovNumhat						1.000	-.003	.333	.176	-.100	-.087	.073	.095	.085
ICRComp							1.000	-.023	.014	.073	.024	-.041	-.009	.065
ΔCFO								1.000	.236	.040	.027	.023	-.009	.155
ΔWCA									1.000	.205	.194	-.024	-.014	.005
AQPeasnell										1.000	.730	-.078	-.055	-.015
ICRAAQ											1.000	-.051	-.035	-.032
Leverage												1.000	.019	.014
Growth													1.000	-.014
SIC5														1.000

Table 4.2.3.3c

Dependent Variable	Interest													
	CRhat	LRhat	DEbitdahat	ICRhat	CovNumhat	ICRComp	ΔCFO	ΔWCA	AQPeasnell	ICRAAQ	Growth	Leverage	SIC4	SIC5
Beta Values	30.658	-6.12	-1.086	-0.406	18.184	-0.004	65.168	-1.131	-2.248	-9.518	-0.022	2.648	0	0
T Values	4.749	-0.498	-0.894	-0.02	1.57	-0.094	1.099	-0.103	-0.161	-0.343	-0.205	0.146	-1.41	0.106
Significance	0	0.619	0.372	0.984	0.117	0.925	0.272	0.918	0.872	0.732	0.838	0.884	0.159	0.916
VIF	1.14	1.195	1.199	8.267	3.565	1.018	1.235	1.191	3.27	2.772	1.042	4.28	1.53	1.093

R-Squared	8.30%
Adjusted R-Squared	6.00%
Regression Sig.	0.00%

Table 4.2.3.3d

Dependent Variable	CovNum													
	CRhat	LRhat	DEbitdahat	ICRhat	Inthat	ICRComp	ΔCFO	ΔWCA	AQPeasnell	ICRAAQ	Growth	Leverage	SIC4	SIC5
Beta Values	0.851	0.309	0.096	-1.071	0.002	0	-1.021	0.032	-0.525	1.082	0.002	-0.754	0	0
T Values	9.629	1.848	5.843	-5.485	0.888	0.065	-1.179	0.213	-3.102	3.074	1.102	-3.893	0.47	-0.07

R-Squared	29.40%
Adjusted R-Squared	27.70%
Regression Sig.	0.00%

Significance	0	0.065	0	0	0.375	0.948	0.239	0.832	0.002	0.002	0.271	0	0.639	0.944
VIF	1.156	1.194	1.194	3.981	1.845	1.017	1.428	1.197	2.606	2.409	1.031	2.641	1.774	1.095

Dependent Variable **CR**

Table 4.2.3.3e

	LRhat	**DEbitdahat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ϭCFO**	**ϭWCA**	**AQPeasnell**	**ICRAAQ**	**LAmount**	**OpCycle**	**Growth**	**SIC4**
Beta Values	-0.068	0.078	0.311	-0.006	1.088	-0.003	-0.743	-0.829	-0.066	0.816	0	0	-0.005	0
T Values	-0.297	2.909	1.244	-2.056	4.535	-1.08	-0.622	-1.081	-0.195	0.758	-3.128	0.991	-0.131	-2.881
Significance	0.768	0.006	0.222	0.047	0	0.288	0.538	0.287	0.846	0.453	0.004	0.329	0.897	0.007
VIF	1.427	1.537	2.488	2.371	3.103	1.188	1.867	1.747	3.951	3.077	2.29	1.63	1.286	1.251

R-Squared	53.70%
Adjusted R Squared	34.70%
Regression Sig.	0.07%

Dependent Variable **LR**

Table 4.2.3.3f

	CRhat	**DEbitdahat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ϭCFO**	**ϭWCA**	**AQPeasnell**	**ICRAAQ**	**Growth**
Beta Values	0.066	0.01	-0.124	-0.001	-0.087	0	0.127	-0.289	-0.092	0.255	-0.009
T Values	2.158	0.939	-1.588	-0.545	-1.271	-1.381	0.219	-0.823	-1.202	1.756	-3.25
Significance	0.034	0.35	0.116	0.587	0.207	0.171	0.827	0.413	0.233	0.083	0.002
VIF	1.21	1.434	3.087	2.631	3.657	1.192	1.83	1.555	4.09	3.834	1.371

R-Squared	22.20%
Adjusted R Squared	12.10%
Regression Sig.	2.30%

Dependent Variable **DEbitda**

Table 4.2.3.3g

	CRhat	**LRhat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ϭCFO**	**ϭWCA**	**AQPeasnell**	**ICRAAQ**	**Leverage**	**SIC4**	**SIC5**
Beta Values	0.198	0.102	-1.454	0.001	-0.377	-0.002	-2.003	-0.113	-0.381	0.178	0.13	0	0
T Values	0.886	0.129	-2.219	0.077	-1.005	-1.546	-1.172	-0.431	-0.834	0.179	0.24	1.511	1.716
Significance	0.376	0.897	0.027	0.939	0.316	0.123	0.242	0.667	0.405	0.858	0.81	0.132	0.087
VIF	1.142	1.052	7.978	1.946	3.193	1.054	1.483	1.301	3.645	3.088	4.451	1.85	1.138

R-Squared	16.40%
Adjusted R Squared	12.40%
Regression Sig.	0.00%

INTEREST COVERAGE RATIO FINANCIAL COVENANT – DECHOW AND DICHEV (DD) MODEL ANALYSIS

Interest Coverage Ratio Covenant - Dechow and Dechow (DD) Model - Descriptives - Table 4.2.3.4a

		CovThres	**ICRComp**	**ϭCFO**	**ϭWC**	**AQDD**	**ICRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	567	567	567	567	567	567	567	567	567	567	567	567	567	567
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.456	3.267	0.054	0.068	0.242	0.084	754,185	125.681	6.768	0.685	3.512	0.039	205.864	2.679
Median		2.25	2.066	0.044	0.05	0.122	0.017	395,439	106.987	6.831	0.658	1.81	0	200	3
Std. Deviation		0.981	55.098	0.047	0.058	0.282	0.13	3,364,593	94.039	1.659	0.285	23.716	0.193	61.253	0.949
Skewness		1.062	6.706	6.64	1.92	0.834	2.073	16	4.999	-0.222	1.511	20.038	4.789	9.139	0.655
Std. Error of Skewness		0.103	0.103	0.103	0.103	0.103	0.103	0	0.103	0.103	0.103	0.103	0.103	0.103	0.103
Kurtosis		2.426	164.847	79.775	4.465	-0.655	4.564	265	50.261	0.125	5.53	453.975	21.008	129.744	0.641
Std. Error of Kurtosis		0.205	0.205	0.205	0.205	0.205	0.205	0	0.205	0.205	0.205	0.205	0.205	0.205	0.205
Minimum		-0.3	-556.642	0.006	0.004	0	0	5,791	0.713	0.382	0.066	-97.094	0	100	1
Maximum		7	921.279	0.726	0.384	0.975	0.692	61,631,003	1316.473	11.322	2.412	536.733	1	1200	7
Percentiles	25	1.75	0.481	0.029	0.027	0	0	216,185	71.315	5.583	0.509	0.965	0	200	2
	50	2.25	2.066	0.044	0.05	0.122	0.017	395,439	106.987	6.831	0.658	1.81	0	200	3
	75	3	4.654	0.068	0.088	0.463	0.116	663,520	158.979	7.845	0.795	3.229	0	200	3

Interest Coverage Ratio - Tests of Normality - DD Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.122	567	0	0.935	567	0
ICRComp	0.373	567	0	0.211	567	0
ϭCFO	0.166	567	0	0.601	567	0
ϭWC	0.149	567	0	0.813	567	0

AQDD	0.221	567	0	0.815	567	0
ICRAAQ	0.259	567	0	0.7	567	0
LAmount	0.412	567	0	0.103	567	0
OpCycle	0.12	567	0	0.697	567	0
FirmSize	0.038	567	0.046	0.993	567	0.015
Leverage	0.105	567	0	0.909	567	0
Growth	0.367	567	0	0.132	567	0
Recession	0.541	567	0	0.189	567	0
Interest	0.482	567	0	0.268	567	0
CovNum	0.255	567	0	0.872	567	0

ICR - Stage 1 of Two Stage Least Squares - DD Model

Dependent Variable	CovThres														
	ICRCom	ΔCFO	ΔWC	AQDD	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-0.095	-0.334	-0.021	0.149	0	0	0.11	-0.94	0	-0.021	0	0	0	0
T Values	-0.101	-0.096	-0.459	-0.09	0.302	-1.262	0.258	3.979	-6.372	0.068	-0.1	1.669	-2.616	-0.436	2.53
Significance	0.92	0.923	0.646	0.928	0.763	0.207	0.797	0	0	0.946	0.92	0.096	0.009	0.663	0.012
VIF	1.013	1.388	1.16	2.672	2.674	1.073	1.087	1.373	1.145	1.027	1.012	1.022	1.105	1.076	1.245

R-Squared	11.70%
Adjusted R-Squared	9.30%
Regression Sig.	0.00%
Breusch-Pagan Test	15.50%

Dependent Variable	Interest														
	ICRCom	ΔCFO	ΔWC	AQDD	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	-0.002	74.378	-15.507	7.498	-20.343	0	0.084	-6.601	13.188	-0.005	8.763	0	0	0	0
T Values	-0.052	1.177	-0.334	0.516	-0.646	-0.857	3.003	-3.722	1.399	-0.048	0.671	2.461	-0.697	0.221	-0.585
Significance	0.958	0.24	0.739	0.606	0.518	0.392	0.003	0	0.163	0.961	0.503	0.014	0.486	0.825	0.559
VIF	1.013	1.388	1.16	2.672	2.674	1.073	1.087	1.373	1.145	1.027	1.012	1.022	1.105	1.076	1.245

R-Squared	7.50%
Adjusted R-Squared	4.90%
Regression Sig.	0.00%

Dependent Variable	CovNum														
	ICRCom	ΔCFO	ΔWC	AQDD	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-1.052	0.697	0.133	-0.065	0	-0.001	-0.247	0.24	0.001	-0.147	0	0	0	0
T Values	-0.027	-1.145	1.032	0.631	-0.142	-0.982	-1.332	-9.588	1.752	0.696	-0.773	-0.842	2.97	0.329	-0.422
Significance	0.979	0.253	0.303	0.528	0.887	0.326	0.184	0	0.08	0.486	0.44	0.4	0.003	0.742	0.673
VIF	1.013	1.388	1.16	2.672	2.674	1.073	1.087	1.373	1.145	1.027	1.012	1.022	1.105	1.076	1.245

R-Squared	18.60%
Adjusted R-Squared	16.30%
Regression Sig.	0.00%

Dependent Variable	CR											
	ICRCom	ΔCFO	ΔWC	AQDD	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4
Beta Values	-0.003	-1.311	0.142	-0.338	1.118	0	0	-0.142	-0.09	-0.033	-0.336	0
T Values	-0.716	-0.905	0.141	-0.767	1.108	-1.584	-0.745	-2.83	-0.35	-0.685	-0.804	-1.555
Significance	0.479	0.371	0.888	0.448	0.275	0.122	0.461	0.008	0.729	0.497	0.427	0.129
VIF	1.426	1.936	1.535	6.124	5.725	3.634	1.416	2.061	2.435	1.351	1.136	1.312

R-Squared	30.60%
Adjusted R-Squared	7.40%
Regression Sig.	25.00%

Dependent Variable	LR										
	ICRCom	ΔCFO	ΔWC	AQDD	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0	-0.105	0.09	-0.019	-0.016	0	0	-0.001	0.322	-0.009	-0.067
T Values	-0.886	-0.234	0.261	-0.27	-0.114	-1.488	-0.428	-0.144	3.602	-3.894	-1.136
Significance	0.378	0.816	0.795	0.788	0.91	0.141	0.67	0.886	0.001	0	0.259
VIF	1.144	1.24	1.263	2.736	2.765	1.132	1.36	1.398	1.511	1.075	1.063

R-Squared	30.60%
Adjusted R-Squared	21.60%
Regression Sig.	0.01%

Dependent Variable	DEbitda													
	ICRCom	ΔCFO	ΔWC	AQDD	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5	SIC7
Beta Values	-0.002	-2.076	1.661	-0.161	-0.611	0	0	-0.033	1.371	-0.006	-0.357	0	0	0
T Values	-1.562	-1.278	1.226	-0.358	-0.578	1.233	0.053	-0.507	4.663	-0.718	-0.833	2.802	2.038	-1.908
Significance	0.119	0.202	0.221	0.72	0.564	0.219	0.958	0.612	0	0.474	0.406	0.005	0.042	0.057
VIF	1.034	1.355	1.143	2.553	2.61	4.739	1.082	1.681	1.335	1.06	1.03	1.294	1.133	4.198

R-Squared	17.60%
Adjusted R-Squared	13.30%
Regression Sig.	0.00%

ICR - Stage 2 of Two Stage Least Squares - DD Model

Table 4.2.3.4b

Dependent Variable	CovThres

	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ϬCFO	ϬWC	AQDD	ICRAAQ	Growth	Leverage	SIC1	SIC4
Beta Values	-0.29	0.481	0.032	0.007	-0.51	0	-0.338	-0.014	0.028	0.312	-0.001	-0.79	0	0
T Values	-2.86	2.508	1.665	1.315	-2.994	-0.121	-0.317	-0.019	0.125	0.625	-1.08	-5.511	-1.052	-0.896
Significance	0.004	0.012	0.096	0.189	0.003	0.904	0.751	0.985	0.9	0.532	0.28	0	0.293	0.371
VIF	1.149	1.193	1.204	4.889	3.189	1.015	1.631	1.247	2.679	2.779	2.417	1.096	1.65	1.085

R-Squared	12.70%
Adjusted R Squared	10.50%
Regression Sig.	0.00%
Breusch-Pagan Test	11.00%

Pearson Correlations

	CovThres	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ϬCFO	ϬWC	AQDD	ICRAAQ	Growth	Leverage	SIC1	SIC4
CovThres	1.000	-.118	.148	-.020	-.092	-.216	.005	-.078	-.044	.013	.010	.032	-.237	-.144	-.036
CRhat		1.000	.029	-.055	.311	.202	.007	.213	.098	.042	.033	.103	-.066	-.070	-.034
LRhat			1.000	-.360	-.117	-.187	.042	-.066	-.085	.044	.046	-.016	-.142	-.062	-.068
DEbitdahat				1.000	.097	.169	-.018	.078	.099	-.067	-.106	-.013	.102	.032	.126
Inthat					1.000	.561	-.022	.464	.232	-.037	-.080	.527	.019	-.149	.066
CovNumhat						1.000	-.003	.331	.228	.071	.067	-.052	.073	.313	.085
ICRComp							1.000	-.023	-.020	-.005	.040	-.002	-.041	.003	.065
ϬCFO								1.000	.299	-.003	.003	.046	.023	.070	.155
ϬWC									1.000	-.016	-.033	.138	-.010	-.110	-.005
AQDD										1.000	.788	-.042	.017	-.008	.067
ICRAAQ											1.000	-.043	.036	.009	.035
Growth												1.000	-.152	-.127	-.094
Leverage													1.000	.091	.014
SIC1														1.000	-.064
SIC4															1.000

Table 4.2.3.4c

Dependent Variable	Interest

	CRhat	LRhat	DEbitdahat	ICRhat	CovNumhat	ICRComp	ϬCFO	ϬWC	AQDD	ICRAAQ	OpCycle	Growth	SIC1	SIC4	SIC5
Beta Values	28.46	-4.589	-1.031	-10.692	15.279	-0.006	55.18	-25.967	2.746	-17.967	0.085	-0.024	0	0	0
T Values	4.427	-0.378	-0.856	-1.011	1.791	-0.129	0.932	-0.559	0.192	-0.58	3.128	-0.224	2.145	-1.413	0.454
Significance	0	0.705	0.392	0.312	0.074	0.897	0.352	0.576	0.848	0.562	0.002	0.823	0.032	0.158	0.65
VIF	1.155	1.191	1.209	2.063	1.996	1.014	1.262	1.199	2.683	2.679	1.066	1.039	1.11	1.348	1.092

R-Squared	10.60%
Adjusted R Squared	8.20%
Regression Sig.	0.00%

Table 4.2.3.4d

Dependent Variable	CovNum

	CRhat	LRhat	DEbitdahat	ICRhat	Inthat	ICRComp	ϬCFO	ϬWC	AQDD	ICRAAQ	LAmount	OpCycle	Growth	SIC5	SIC7
Beta Values	0.835	0.323	0.096	-0.559	0.009	0	-1.549	0.389	-0.035	0.418	0	-0.001	0.002	0	0
T Values	9.355	1.91	5.722	-4.697	2.808	0.027	-1.69	0.618	-0.175	0.963	0.289	-2.441	1.586	-0.095	1.066
Significance	0	0.057	0	0	0.005	0.978	0.092	0.537	0.861	0.336	0.773	0.015	0.113	0.924	0.287
VIF	1.148	1.194	1.207	1.351	2.33	1.013	1.558	1.139	2.683	2.715	1.107	1.694	1.014	1.085	1.143

R-Squared	27.80%
Adjusted R Squared	25.80%
Regression Sig.	0.00%

Table 4.2.3.4e

Dependent Variable	CR

	LRhat	DEbitdahat	ICRhat	Inthat	CovNumhat	ICRComp	ϬCFO	ϬWC	AQDD	ICRAAQ	LAmount	OpCycle	SIC4
Beta Values	-0.083	0.061	0.326	-0.007	1.047	-0.002	-1.093	-0.319	-0.301	0.487	0	0.001	0
T Values	-0.376	2.241	1.219	-2.154	4.158	-0.746	-0.873	-0.358	-0.76	0.55	-2.61	1.322	-2.9
Significance	0.709	0.031	0.231	0.038	0	0.46	0.389	0.723	0.453	0.586	0.013	0.195	0.006
VIF	1.3	1.499	2.521	2.646	3.408	1.382	1.938	1.627	6.662	5.891	2.405	1.619	1.412

R-Squared	49.60%
Adjusted R Squared	30.90%
Regression Sig.	1.10%

Table 4.2.3.4f

Dependent Variable	LR

	CRhat	DEbitdahat	ICRhat	Inthat	CovNumhat	ICRComp	ϬCFO	ϬWC	AQDD	ICRAAQ	LAmount	OpCycle
Beta Values	0.063	-0.007	-0.257	0.003	-0.204	0	-1.106	0.312	-0.048	0.131	0	0
T Values	2.048	-0.63	-2.711	1.667	-2.692	-1.185	-1.977	0.831	-0.646	0.844	-2.585	-1.633

R-Squared	22.10%
Adjusted R Squared	10.90%
Regression Sig.	3.80%

Significance	0.044	0.53	0.008	0.099	0.009	0.239	0.051	0.408	0.52	0.401	0.011	0.106
VIF	1.192	1.305	3.619	3.568	4.333	1.134	1.688	1.316	2.802	2.916	1.425	1.799

Dependent Variable **DEbitda**

Table 4.2.3.4g

	CRhat	**LRhat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ϬCFO**	**ϬWC**	**AQDD**	**ICRAAQ**	**OpCycle**	**Growth**	**SIC4**	**SIC5**
Beta Values	0.237	0.14	-1.527	-0.003	-0.319	-0.002	-2.376	1.385	-0.131	-0.573	0	-0.004	0	0
T Values	1.071	0.184	-4.759	-0.313	-0.898	-1.743	-1.303	0.993	-0.288	-0.532	0.224	-0.531	1.548	1.942
Significance	0.285	0.854	0	0.755	0.37	0.082	0.194	0.322	0.774	0.595	0.823	0.596	0.123	0.053
VIF	1.145	1.045	1.802	4.596	2.94	1.055	1.699	1.207	2.601	2.694	2.592	1.047	1.731	1.11

R-Squared	17.20%
Adjusted R-Squared	13.00%
Regression Sig.	0.00%

INTEREST COVERAGE RATIO FINANCIAL COVENANT – MCNICHOLS MODEL ANALYSIS

Interest Coverage Ratio Covenant - McNichols Model - Descriptives - Table 4.2.3.5a

		CovThres	**ICRComp**	**ϬCFO**	**ϬWC**	**AQMcNichols**	**ICRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	567	567	567	567	567	567	567	567	567	567	567	567	567	567
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.456	3.267	0.054	0.068	0.515	0.17	754,185	125.681	6.768	0.685	3.512	0.039	205.864	2.679
Median		2.25	2.066	0.044	0.05	0.575	0.115	395,439	106.987	6.831	0.658	1.81	0	200	3
Std. Deviation		0.981	55.098	0.047	0.058	0.367	0.184	3,364,593	94.039	1.659	0.285	23.716	0.193	61.253	0.949
Skewness		1.062	6.706	6.64	1.92	-0.224	1.293	16	4.999	-0.222	1.511	20.038	4.789	9.139	0.655
Std. Error of Skewness		0.103	0.103	0.103	0.103	0.103	0.103	0	0.103	0.103	0.103	0.103	0.103	0.103	0.103
Kurtosis		2.426	164.847	79.775	4.465	-1.472	1.3	265	50.261	0.125	5.53	453.975	21.008	129.744	0.641
Std. Error of Kurtosis		0.205	0.205	0.205	0.205	0.205	0.205	0	0.205	0.205	0.205	0.205	0.205	0.205	0.205
Minimum		-0.3	-556.642	0.006	0.004	0	0	5,791	0.713	0.382	0.066	-97.094	0	100	1
Maximum		7	921.279	0.726	0.384	1	0.95	61,631,003	1316.473	11.322	2.412	536.733	1	1200	7
Percentiles	25	1.75	0.481	0.029	0.027	0.138	0.009	216,185	71.315	5.583	0.509	0.965	0	200	2
	50	2.25	2.066	0.044	0.05	0.575	0.115	395,439	106.987	6.831	0.658	1.81	0	200	3
	75	3	4.654	0.068	0.088	0.868	0.263	663,520	158.979	7.845	0.795	3.229	0	200	3

Interest Coverage Ratio - Tests of Normality - McNichols Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.122	567	0	0.935	567	0
ICRComp	0.373	567	0	0.211	567	0
ϬCFO	0.166	567	0	0.601	567	0
ϬWC	0.149	567	0	0.813	567	0
AQMcNichols	0.141	567	0	0.877	567	0
ICRAAQ	0.177	567	0	0.851	567	0
LAmount	0.412	567	0	0.103	567	0
OpCycle	0.12	567	0	0.697	567	0
FirmSize	0.038	567	0.046	0.993	567	0.015
Leverage	0.105	567	0	0.909	567	0
Growth	0.367	567	0	0.132	567	0
Recession	0.541	567	0	0.189	567	0
Interest	0.482	567	0	0.268	567	0
CovNum	0.255	567	0	0.872	567	0

ICR - Stage 1 of Two Stage Least Squares - McNichols Model

Dependent Variable **CovThres**

	ICRComp	**ϬCFO**	**ϬWC**	**AQMcNichols**	**ICRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC1**	**SIC4**	**SIC5**	**SIC7**
Beta Values	0	-0.087	-0.203	-0.242	0.474	0	0	0.114	-0.935	0	-0.038	0	0	0	0
T Values	-0.086	-0.088	-0.277	-1.663	1.649	-1.229	0.206	4.099	-6.357	0.017	-0.188	1.698	-2.643	-0.404	2.573
Significance	0.931	0.93	0.782	0.097	0.1	0.22	0.837	0	0	0.986	0.851	0.09	0.008	0.686	0.01

R-Squared	12.20%
Adjusted R-Squared	9.80%
Regression Sig.	0.00%
Breusch-Pagan Test	32.80%

VIF	1.008	1.39	1.181	1.858	1.817	1.076	1.09	1.385	1.145	1.031	1.013	1.021	1.105	1.07	1.235

Dependent Variable: Interest

	ICRComb	ΔCFO	ΔWC	AQMcNichols	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	-0.005	75.004	-15.064	2.459	-10.08	0	0.083	-6.582	12.868	-0.006	8.807	0	0	0	0
T Values	-0.107	1.186	-0.321	0.264	-0.547	-0.845	2.992	-3.694	1.365	-0.06	0.674	2.452	-0.694	0.234	-0.6
Significance	0.915	0.236	0.748	0.792	0.585	0.398	0.003	0	0.173	0.952	0.501	0.015	0.488	0.815	0.549
VIF	1.008	1.39	1.181	1.858	1.817	1.076	1.09	1.385	1.145	1.031	1.013	1.021	1.105	1.07	1.235

R-Squared	7.40%
Adjusted R-Squared	4.90%
Regression Sig.	0.00%

Dependent Variable: CovNum

	ICRComb	ΔCFO	ΔWC	AQMcNichols	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-1.099	0.576	0.187	-0.254	0	-0.001	-0.25	0.236	0.001	-0.131	0	0	0	0
T Values	-0.031	-1.197	0.845	1.382	-0.948	-1.075	-1.291	-9.67	1.727	0.742	-0.693	-0.901	2.983	0.383	-0.363
Significance	0.976	0.232	0.398	0.167	0.343	0.283	0.197	0	0.085	0.459	0.489	0.368	0.003	0.702	0.717
VIF	1.008	1.39	1.181	1.858	1.817	1.076	1.09	1.385	1.145	1.031	1.013	1.021	1.105	1.07	1.235

R-Squared	18.70%
Adjusted R-Squared	16.50%
Regression Sig.	0.00%

Dependent Variable: CR

	ICRComb	ΔCFO	ΔWC	AQMcNichols	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4
Beta Values	-0.002	-1.292	0.134	-0.039	0.578	0	0	-0.128	-0.034	-0.03	-0.304	0
T Values	-0.461	-0.883	0.134	-0.183	1.031	-1.508	-0.707	-2.568	-0.133	-0.652	-0.74	-1.373
Significance	0.648	0.383	0.894	0.856	0.309	0.14	0.484	0.015	0.895	0.518	0.464	0.178
VIF	1.241	1.973	1.53	1.991	1.868	3.507	1.397	2.009	2.408	1.255	1.097	1.338

R-Squared	30.60%
Adjusted R-Squared	7.40%
Regression Sig.	24.90%

Dependent Variable: LR

	ICRComb	ΔCFO	ΔWC	AQMcNichols	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0	-0.088	0.125	-0.031	0.025	0	0	0	0.319	-0.01	-0.071
T Values	-0.971	-0.197	0.345	-0.641	0.306	-1.277	-0.449	0.004	3.638	-3.947	-1.202
Significance	0.334	0.844	0.731	0.523	0.76	0.205	0.655	0.997	0	0	0.233
VIF	1.123	1.226	1.393	2.407	2.253	1.175	1.369	1.398	1.457	1.091	1.071

R-Squared	30.70%
Adjusted R-Squared	21.70%
Regression Sig.	0.01%

Dependent Variable: DEbitda

	ICRComb	ΔCFO	ΔWC	AQMcNichols	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5	SIC7
Beta Values	-0.002	-1.791	1.91	-0.308	-0.249	0	0	-0.022	1.374	-0.006	-0.369	0	0	0
T Values	-1.636	-1.101	1.398	-1.044	-0.4	1.324	-0.063	-0.34	4.683	-0.729	-0.865	2.535	1.903	-2.096
Significance	0.103	0.272	0.163	0.297	0.689	0.187	0.95	0.734	0	0.467	0.388	0.012	0.058	0.037
VIF	1.019	1.365	1.167	1.898	1.845	4.726	1.091	1.689	1.335	1.061	1.024	1.32	1.131	4.152

R-Squared	17.90%
Adjusted R-Squared	13.70%
Regression Sig.	0.00%

ICR - Stage 2 of Two Stage Least Squares - McNichols Model

Dependent Variable: CovThres

Table 4.2.3.5b

	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔWC	AQMcNichols	ICRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
Beta Values	-0.232	0.579	0.026	0.001	-0.369	0	0.147	-0.134	-0.113	0.326	0	0	0.001	0	0
T Values	-2.229	2.944	1.339	0.138	-2.104	0.08	0.134	-0.174	-0.759	1.105	-1.183	0.259	0.341	-1.873	-0.725
Significance	0.026	0.003	0.181	0.891	0.036	0.936	0.893	0.862	0.448	0.27	0.238	0.795	0.733	0.062	0.468
VIF	1.153	1.192	1.21	4.914	3.252	1.01	1.645	1.249	1.878	1.843	1.046	2.345	1.053	1.624	1.078

R-Squared	8.50%
Adjusted R-Squared	6.00%
Regression Sig.	0.00%
Breusch-Pagan Test	28.70%

Pearson Correlations

	CovThres	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔWC	AQMcNichols	ICRAAQ	LAmount	OpCycle	Growth	SIC4	SIC5
CovThres	1.000	-.118	.149	-.019	-.096	-.224	.005	-.078	-.044	-.028	.028	-.073	.032	-.018	-.144	-.036
CRhat		1.000	.029	-.055	.318	.206	.007	.213	.098	.042	-.018	-.004	.103	-.024	-.070	-.033
LRhat			1.000	-.361	-.121	-.201	.042	-.066	-.085	-.041	.037	-.015	-.016	-.019	-.062	-.068
DEbitdahat				1.000	.097	.174	-.018	.078	.099	-.055	-.104	-.012	-.013	-.051	.032	.126
Inthat					1.000	.562	-.022	.465	.232	-.078	-.100	-.008	.527	-.033	-.150	.066
CovNumhat						1.000	-.003	.329	.227	.049	-.006	.116	-.052	.094	.311	.084
ICRComp							1.000	-.023	-.020	-.024	-.021	-.002	-.002	-.009	.003	.065

ΔCFO								1.000	.299	.049	.044	.048	.046	-.009	.070	.155
ΔWC									1.000	.120	.044	.032	.138	.007	-.110	-.005
AQMcNichols										1.000	.666	.057	-.059	-.057	.000	-.002
ICRAAQ											1.000	.049	-.044	-.037	.020	-.014
LAmount												1.000	.004	.004	.044	-.001
OpCycle													1.000	.009	-.127	-.094
Growth														1.000	.153	-.014
SIC4															1.000	-.064
SIC5																1.000

Dependent Variable **Interest**

Table 4.2.3.5c

	CRhat	**LRhat**	**DEbitdahat**	**ICRhat**	**CovNumhat**	**ICRComp**	**ΔCFO**	**ΔWC**	**AQMcNichols**	**ICRAAQ**	**LAmount**	**OpCycle**	**Growth**	**SIC1**	**SIC4**	**SIC5**
Beta Values	27.839	-4.691	-1.059	-12.233	14.586	-0.008	57.063	-19.098	-7.494	5.344	0	0.084	-0.028	0	0	0
T Values	4.306	-0.384	-0.877	-1.128	1.707	-0.18	0.962	-0.408	-0.8	0.286	-0.643	3.094	-0.265	2.198	-1.435	0.427
Significance	0	0.701	0.381	0.26	0.088	0.857	0.337	0.683	0.424	0.775	0.521	0.002	0.791	0.028	0.152	0.67
VIF	1.166	1.204	1.212	2.256	2.017	1.009	1.263	1.214	1.933	1.934	1.064	1.071	1.042	1.114	1.353	1.084

R-Squared	10.60%
Adjusted R Squared	8.00%
Regression Sig.	0.00%

Dependent Variable **CovNum**

Table 4.2.3.5d

	CRhat	**LRhat**	**DEbitdahat**	**ICRhat**	**Inthat**	**ICRComp**	**ΔCFO**	**ΔWC**	**AQMcNichols**	**ICRAAQ**	**LAmount**	**Leverage**	**Growth**	**SIC4**	**SIC5**
Beta Values	0.842	0.323	0.095	-1.193	0.002	0	-1.086	0.065	-0.209	0.617	0	-0.826	0.002	0	0
T Values	9.545	1.929	5.766	-5.649	0.658	-0.18	-1.242	0.102	-1.574	2.353	-0.955	-4.133	1.206	0.078	-0.181
Significance	0	0.054	0	0	0.511	0.857	0.215	0.919	0.116	0.019	0.34	0	0.228	0.938	0.857
VIF	1.15	1.203	1.207	4.543	1.874	1.011	1.454	1.196	2.059	2.016	1.187	2.814	1.035	1.877	1.101

R-Squared	29.60%
Adjusted R Squared	27.70%
Regression Sig.	0.00%

Dependent Variable **CR**

Table 4.2.3.5e

	LRhat	**DEbitdahat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ΔCFO**	**ΔWC**	**AQMcNichols**	**ICRAAQ**	**Leverage**	**Growth**	**SIC4**
Beta Values	-0.02	0.057	-0.397	-0.004	0.648	-0.001	-1.844	-0.123	-0.205	0.832	-0.602	-0.026	0
T Values	-0.092	2.156	-1.612	-1.543	3.239	-0.495	-1.653	-0.149	-1.134	1.748	-3.375	-0.685	-2.861
Significance	0.927	0.038	0.116	0.132	0.003	0.623	0.107	0.883	0.264	0.089	0.002	0.498	0.007
VIF	1.362	1.514	2.298	1.871	2.311	1.27	1.689	1.539	2.094	1.983	1.743	1.24	1.463

R-Squared	54.20%
Adjusted R Squared	37.10%
Regression Sig.	0.03%

Dependent Variable **LR**

Table 4.2.3.5f

	CRhat	**DEbitdahat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ΔCFO**	**ΔWC**	**AQMcNichols**	**ICRAAQ**	**Growth**
Beta Values	0.065	0.005	-0.136	0	-0.094	0	-0.269	0.063	-0.055	0.104	-0.008
T Values	2.065	0.435	-1.664	-0.183	-1.312	-1.601	-0.488	0.173	-1.01	1.071	-2.842
Significance	0.042	0.665	0.1	0.855	0.193	0.113	0.627	0.863	0.315	0.287	0.006
VIF	1.223	1.333	2.898	2.448	3.705	1.119	1.612	1.227	2.626	2.687	1.313

R-Squared	20.00%
Adjusted R Squared	9.50%
Regression Sig.	5.00%

Dependent Variable **DEbitda**

Table 4.2.3.5g

	CRhat	**LRhat**	**ICRhat**	**Inthat**	**CovNumhat**	**ICRComp**	**ΔCFO**	**ΔWC**	**AQMcNichols**	**ICRAAQ**	**Leverage**	**SIC4**	**SIC5**
Beta Values	0.24	0.199	-1.228	-0.002	-0.303	-0.002	-2.284	2.042	-0.572	0.224	0.326	0	0
T Values	1.095	0.26	-1.989	-0.293	-0.862	-1.774	-1.345	1.485	-1.795	0.333	0.651	1.598	1.977
Significance	0.275	0.795	0.048	0.77	0.389	0.077	0.18	0.139	0.074	0.739	0.516	0.111	0.049
VIF	1.136	1.044	6.974	1.891	2.888	1.042	1.487	1.183	2.222	2.162	3.882	1.861	1.126

R-Squared	17.60%
Adjusted R Squared	13.70%
Regression Sig.	0.00%

INTEREST COVDERAGE RATIO FINANCIAL COVENANT – FRANCIS MODEL ANALYSIS

Interest Coverage Ratio Covenant - Francis Model - Descriptives - Table 4.2.3.6a

		CovThres	**ICRComp**	**ΔCFO**	**ΔTCA**	**AQFrancis**	**ICRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	567	567	567	567	567	567	567	567	567	567	567	567	567	567
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.456	3.267	0.054	0.053	0.414	0.138	754,185	125.681	6.768	0.685	3.512	0.039	205.864	2.679
Median		2.25	2.066	0.044	0.041	0.406	0.064	395,439	106.987	6.831	0.658	1.81	0	200	3

Std. Deviation		0.981	55.098	0.047	0.045	0.367	0.175	3,364,593	94.039	1.659	0.285	23.716	0.193	61.253	0.949
Skewness		1.062	6.706	6.64	2.494	0.141	1.467	16	4.999	-0.222	1.511	20.038	4.789	9.139	0.655
Std. Error of Skewness		0.103	0.103	0.103	0.103	0.103	0.103	0	0.103	0.103	0.103	0.103	0.103	0.103	0.103
Kurtosis		2.426	164.847	79.775	11.225	-1.563	1.7	265	50.261	0.125	5.53	453.975	21.008	129.744	0.641
Std. Error of Kurtosis		0.205	0.205	0.205	0.205	0.205	0.205	0	0.205	0.205	0.205	0.205	0.205	0.205	0.205
Minimum		-0.3	-556.642	0.006	0.004	0	0	5,791	0.713	0.382	0.066	-97.094	0	100	1
Maximum		7	921.279	0.726	0.437	1	0.862	61,631,003	1316.473	11.322	2.412	536.733	1	1200	7
	25	1.75	0.481	0.029	0.024	0	0	216,185	71.315	5.583	0.509	0.965	0	200	2
Percentiles	50	2.25	2.066	0.044	0.041	0.406	0.064	395,439	106.987	6.831	0.658	1.81	0	200	3
	75	3	4.654	0.068	0.065	0.764	0.236	663,520	158.979	7.845	0.795	3.229	0	200	3

Interest Coverage Ratio - Tests of Normality - Francis Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.122	567	0	0.935	567	0
ICRComp	0.373	567	0	0.211	567	0
ΘCFO	0.166	567	0	0.601	567	0
ΘTCA	0.167	567	0	0.786	567	0
AQFrancis	0.191	567	0	0.856	567	0
ICRAAQ	0.216	567	0	0.793	567	0
LAmount	0.412	567	0	0.103	567	0
OpCycle	0.12	567	0	0.697	567	0
FirmSize	0.038	567	0.046	0.993	567	0.015
Leverage	0.105	567	0	0.909	567	0
Growth	0.367	567	0	0.132	567	0
Recession	0.541	567	0	0.189	567	0
Interest	0.482	567	0	0.268	567	0
CovNum	0.255	567	0	0.872	567	0

ICR - Stage 1 of Two Stage Least Squares - Francis Model

Dependent Variable: CovThres

	ICRComp	ΘCFO	ΘTCA	AQFrancis	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	0.392	-1.82	0.181	-0.205	0	0	0.099	-0.918	0	-0.003	0	0	0	0
T Values	0.033	0.39	-1.805	1.211	-0.648	-1.239	0.209	3.485	-6.232	0.023	-0.013	1.694	-2.697	-0.515	2.483
Significance	0.973	0.697	0.072	0.227	0.517	0.216	0.835	0.001	0	0.982	0.99	0.091	0.007	0.607	0.013
VIF	1.011	1.449	1.339	1.966	1.991	1.091	1.083	1.442	1.15	1.027	1.015	1.025	1.089	1.076	1.234

R-Squared	12.30%
Adjusted R Squared	9.90%
Regression Sig.	0.00%
Breusch-Pagan Test	42.20%

Dependent Variable: Interest

	ICRComp	ΘCFO	ΘTCA	AQFrancis	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	-0.008	47.143	64.106	-8.975	-7.494	0	0.082	-6.086	11.716	-0.008	8.721	0	0	0	0
T Values	-0.173	0.732	0.994	-0.938	-0.371	-0.749	2.974	-3.358	1.243	-0.078	0.669	2.364	-0.604	0.236	-0.441
Significance	0.862	0.464	0.321	0.349	0.711	0.454	0.003	0.001	0.214	0.938	0.504	0.018	0.546	0.813	0.659
VIF	1.011	1.449	1.339	1.966	1.991	1.091	1.083	1.442	1.15	1.027	1.015	1.025	1.089	1.076	1.234

R-Squared	8.00%
Adjusted R Squared	5.50%
Regression Sig.	0.00%

Dependent Variable: CovNum

	ICRComp	ΘCFO	ΘTCA	AQFrancis	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC1	SIC4	SIC5	SIC7
Beta Values	0	-1.963	3.517	-0.019	-0.05	0	-0.001	-0.226	0.2	0.001	-0.153	0	0	0	0
T Values	-0.282	-2.116	3.784	-0.138	-0.17	-0.912	-1.421	-8.639	1.476	0.81	-0.816	-0.959	3.171	0.536	-0.283
Significance	0.778	0.035	0	0.89	0.865	0.362	0.156	0	0.141	0.418	0.415	0.338	0.002	0.592	0.778
VIF	1.011	1.449	1.339	1.966	1.991	1.091	1.083	1.442	1.15	1.027	1.015	1.025	1.089	1.076	1.234

R-Squared	20.40%
Adjusted R Squared	18.20%
Regression Sig.	0.00%

Dependent Variable: CR

	ICRComp	ΘCFO	ΘTCA	AQFrancis	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4
Beta Values	-0.005	-0.044	-2.688	-0.357	0.999	0	0	-0.161	-0.308	-0.032	-0.198	0
T Values	-1.513	-0.033	-2.156	-1.516	1.616	-1.339	-0.482	-3.299	-1.227	-0.768	-0.511	-1.65
Significance	0.139	0.974	0.038	0.138	0.115	0.189	0.633	0.002	0.228	0.447	0.612	0.108
VIF	1.259	1.916	1.561	2.813	2.794	3.418	1.434	2.252	2.733	1.215	1.138	1.21

R-Squared	40.30%
Adjusted R Squared	20.40%
Regression Sig.	5.10%

Dependent Variable	LR										
	ICRCom	ΔCFO	ΔTCA	AQFrancis	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession
Beta Values	0	-0.141	0.227	0.021	-0.037	0	0	-0.001	0.301	-0.009	-0.071
T Values	-1.084	-0.293	0.477	0.416	-0.406	-1.432	-0.553	-0.105	3.417	-3.742	-1.173
Significance	0.282	0.77	0.635	0.679	0.686	0.156	0.581	0.917	0.001	0	0.244
VIF	1.239	1.412	1.825	2.574	2.468	1.133	1.374	1.549	1.468	1.133	1.108

R-Squared	30.70%
Adjusted R-Squared	21.60%
Regression Sig.	0.01%

Dependent Variable	DEbitda													
	ICRCom	ΔCFO	ΔTCA	AQFrancis	ICRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC4	SIC5	SIC7
Beta Values	-0.002	-2.481	3.898	0.314	-0.431	0	0	-0.018	1.332	-0.007	-0.359	0	0	0
T Values	-1.807	-1.473	1.693	1.051	-0.647	1.314	0.132	-0.273	4.496	-0.798	-0.837	2.834	2.004	-2.149
Significance	0.072	0.142	0.092	0.294	0.518	0.19	0.895	0.785	0	0.426	0.404	0.005	0.046	0.033
VIF	1.026	1.46	1.329	2.009	2.023	4.772	1.083	1.777	1.359	1.054	1.035	1.282	1.145	4.077

R-Squared	17.80%
Adjusted R-Squared	13.50%
Regression Sig.	0.00%

ICR - Stage 2 of Two Stage Least Squares - Francis Model

Table 4.2.3.6b

Dependent Variable	CovThres															
	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTCA	AQFrancis	ICRAAQ	OpCycle	Leverage	Growth	SIC4	SIC5	SIC7
Beta Values	-0.286	0.487	0.029	0.009	-0.599	0	-0.922	-0.237	0.292	-0.311	-0.001	-0.876	0.001	0	0	0
T Values	-2.853	2.548	1.528	1.71	-3.236	-0.064	-0.825	-0.2	1.882	-0.995	-1.398	-5.939	0.609	-0.587	-0.578	2.393
Significance	0.004	0.011	0.127	0.088	0.001	0.949	0.41	0.842	0.06	0.32	0.163	0	0.543	0.557	0.563	0.017
VIF	1.147	1.2	1.195	5.727	4.188	1.015	1.821	1.896	2.16	1.986	2.516	1.176	1.059	1.762	1.103	1.221

R-Squared	14.20%
Adjusted R-Squared	11.70%
Regression Sig.	0.00%
Breusch-Pagan Test	23.70%

Pearson Correlations

	CovThres	CRhat	LRhat	DEbitdahat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTCA	AQFrancis	ICRAAQ	OpCycle	Leverage	Growth	SIC4	SIC5	SIC7
CovThres	1.000	-.115	.148	-.019	-.106	-.227	.005	-.078	-.122	.040	-.001	.032	-.237	-.018	-.144	-.036	-.002
CRhat		1.000	.035	-.056	.304	.188	.007	.212	.139	-.028	-.050	.103	-.065	-.024	-.070	-.032	.065
LRhat			1.000	-.360	-.111	-.193	.042	-.066	-.104	-.053	.000	-.016	-.142	-.019	-.062	-.067	-.054
DEbitdahat				1.000	.082	.157	-.018	.078	.056	.040	-.006	-.013	.102	-.051	.032	.126	.047
Inthat					1.000	.567	-.022	.449	.466	-.228	-.219	.509	.018	-.032	-.145	.064	.086
CovNumhat						1.000	-.003	.316	.570	.006	.009	-.050	.070	.090	.299	.081	.179
ICRComp							1.000	-.023	.038	-.011	-.016	-.002	-.041	-.009	.003	.065	-.017
ΔCFO								1.000	.422	-.006	.010	.046	.023	-.009	.070	.155	.242
ΔTCA									1.000	.098	.045	.085	.028	-.039	-.041	.022	.121
AQFrancis										1.000	.691	.029	-.010	-.025	-.017	-.045	.068
ICRAAQ											1.000	-.017	-.007	-.023	.006	-.074	.073
OpCycle												1.000	-.152	.009	-.127	-.094	-.066
Leverage													1.000	.019	.091	.014	.242
Growth														1.000	.153	-.014	-.013
SIC4															1.000	-.064	-.040
SIC5																1.000	-.039
SIC7																	1.000

Table 4.2.3.6c

Dependent Variable	Interest														
	CRhat	LRhat	DEbitdahat	ICRhat	CovNumhat	ICRComp	ΔCFO	ΔTCA	AQFrancis	ICRAAQ	OpCycle	Growth	SIC4	SIC5	SIC7
Beta Values	28.682	-4.833	-0.941	-3.951	17.463	-0.008	52.701	5.171	-8.267	-5.564	0.08	-0.031	0	0	0
T Values	4.514	-0.396	-0.784	-0.379	1.877	-0.181	0.843	0.068	-0.85	-0.278	2.962	-0.291	-1.217	0.314	-0.216
Significance	0	0.693	0.434	0.705	0.061	0.856	0.4	0.946	0.396	0.781	0.003	0.771	0.224	0.754	0.829
VIF	1.13	1.2	1.193	2.104	2.592	1.014	1.398	1.894	2.075	1.998	1.065	1.044	1.399	1.108	1.138

R-Squared	10.00%
Adjusted R-Squared	7.60%
Regression Sig.	0.00%

Table 4.2.3.6d

Dependent Variable	CovNum													
	CRhat	LRhat	DEbitdahat	ICRhat	Inthat	ICRComp	ΔCFO	ΔTCA	AQFrancis	ICRAAQ	Growth	Leverage	SIC4	SIC5
Beta Values	0.85	0.349	0.1	-1.025	0.002	0	-1.741	2.049	0.145	-0.066	0.002	-0.709	0	0

R-Squared	32.20%
Adjusted R-Squared	30.50%

T Values	9.926	2.131	6.215	-4.988	0.691	-0.316	-2.019	2.072	1.074	-0.238	1.332	-3.657	0.712	0.077
Significance	0	0.034	0	0	0.49	0.752	0.044	0.039	0.283	0.812	0.183	0	0.477	0.939
VIF	1.136	1.198	1.187	4.52	2	1.015	1.472	1.783	2.22	2.126	1.03	2.757	1.833	1.118

Regression Sig.	0.00%

Dependent Variable CR

Table 4.2.3.6e

	LRhat	DEbitdahat	ICRhat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTCA	AQFrancis	ICRAAQ	OpCycle	Leverage	Growth	SIC4
Beta Values	-0.172	0.038	-0.696	0.004	0.129	-0.004	0.492	-3.575	0.019	0.456	0	-0.717	-0.027	0
T Values	-0.69	1.351	-2.638	1.238	1.999	-1.167	0.413	-2.535	0.076	0.671	-0.188	-3.408	-0.663	-2.36
Significance	0.495	0.186	0.012	0.224	0.054	0.251	0.682	0.016	0.94	0.507	0.852	0.002	0.512	0.024
VIF	1.637	1.546	2.417	2.399	1.543	1.277	1.741	2.279	3.523	3.844	1.89	2.183	1.286	1.433

R-Squared	50.60%
Adjusted R-Squared	30.30%
Regression Sig.	1.50%

Dependent Variable LR

Table 4.2.3.6f

	CRhat	DEbitdahat	ICRhat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTCA	AQFrancis	ICRAAQ	OpCycle	Leverage	Growth
Beta Values	0.056	0.006	0.021	0.001	-0.014	0	-0.286	0.028	0.031	-0.01	0	0.335	-0.009
T Values	1.748	0.555	0.307	0.525	-0.714	-0.858	-0.547	0.054	0.545	-0.11	-0.71	3.352	-3.222
Significance	0.084	0.58	0.76	0.601	0.477	0.393	0.586	0.957	0.587	0.913	0.48	0.001	0.002
VIF	1.538	1.675	2.285	2.396	2.187	1.291	1.644	2.143	3.153	2.577	1.594	1.854	1.453

R-Squared	31.00%
Adjusted R-Squared	20.10%
Regression Sig.	0.02%

Dependent Variable DEbitda

Table 4.2.3.6g

	CRhat	LRhat	ICRhat	Inthat	CovNumhat	ICRComp	ΔCFO	ΔTCA	AQFrancis	ICRAAQ	FirmSize
Beta Values	-0.143	-0.544	-1.597	0.002	0.495	-0.001	-0.138	-2.127	0.64	-0.963	0.172
T Values	-0.637	-0.719	-6.322	0.279	4.448	-1.313	-0.086	-0.873	2.137	-1.492	2.386
Significance	0.525	0.472	0	0.78	0	0.19	0.931	0.383	0.033	0.137	0.018
VIF	1.265	1.096	1.245	2.59	1.474	1.047	1.403	1.581	2.146	2.019	2.182

R-Squared	21.70%
Adjusted R-Squared	18.60%
Regression Sig.	0.00%

DEBT TO EBITDA (DEBITDA) RATIO FINANCIAL COVENANT – JONES MODEL ANALYSIS

Debt to EBITDA (DEbitda) Ratio Covenant - Jones Model - Descriptives - Table 4.2.4.1a

		CovThres	DEbitdaComp	ΔCFO	ΔTA	AQJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	368	368	368	368	368	368	368	368	368	368	368	368	368	368
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.28	5.15	0.061	0.074	0.209	0.094	658,170	124.046	6.257	0.647	2.516	0.033	202.989	2.935
Median		4	4.381	0.05	0.048	0.073	0.013	467,933	107.254	6.262	0.626	1.926	0	200	3
Std. Deviation		1.516	8.783	0.054	0.145	0.27	0.166	892,488	98.488	1.62	0.293	8.547	0.178	60.012	0.833
Skewness		1.65	-1.334	6.351	12.046	1.161	2.461	11	5.991	-0.038	1.367	-3.957	5.285	0.494	0.949
Std. Error of Skewness		0.127	0.127	0.127	0.127	0.127	0.127	0	0.127	0.127	0.127	0.127	0.127	0.127	0.127
Kurtosis		7.492	66.433	65.227	178.204	0.154	6.441	166	63.528	-0.21	4.758	55.07	26.069	9.631	2.102
Std. Error of Kurtosis		0.254	0.254	0.254	0.254	0.254	0.254	0	0.254	0.254	0.254	0.254	0.254	0.254	0.254
Minimum		0.4	-93.789	0.006	0.01	0	0	5,791	7.639	0.382	0.066	-97.094	0	0	1
Maximum		15	86.57	0.726	2.373	0.975	0.968	14,675,768	1316.473	10.331	2.412	42.614	1	500	7
Percentiles	25	3.5	2.713	0.032	0.032	0	0	264,861	72.667	5.104	0.455	0.982	0	200	2
	50	4	4.381	0.05	0.048	0.073	0.013	467,933	107.254	6.262	0.626	1.926	0	200	3
	75	5	6.851	0.071	0.074	0.361	0.115	795,622	157.281	7.405	0.78	3.442	0	200	3

Debt to EBITDA (DEbitda) Ratio Covenant - Tests of Normality - Jones Model - Table 4.2.4.1b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.127	367	0	0.907	367	0
DEbitdaComp	0.278	367	0	0.473	367	0
ΔCFO	0.184	367	0	0.569	367	0
ΔTA	0.331	367	0	0.26	367	0
AQJones	0.219	367	0	0.78	367	0
DEAAQ	0.286	367	0	0.631	367	0

LAmount	0.238	367	0	0.415	367	0
OpCycle	0.13	367	0	0.639	367	0
FirmSize	0.036	367	.200*	0.995	367	0.239
Leverage	0.081	367	0	0.924	367	0
Growth	0.305	367	0	0.523	367	0
Recession	0.54	367	0	0.169	367	0
Interest	0.438	367	0	0.484	367	0
CovNum	0.257	367	0	0.823	367	0

DEbitda - Stage 1 of Two Stage Least Squares - Jones Model

Dependent Variable	**CovThres**

	DEbitdaComp	**ΔCFO**	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**	**SIC4**	**SIC5**
Beta Values	0.01	-2.349	0.307	0.218	0.005	0	0	0.003	1.693	0.001	-0.498	0	0	0
T Values	1.116	-1.514	0.54	0.455	0.007	-1.162	-0.012	0.059	5.653	0.071	-1.205	2.972	4.43	2.161
Significance	0.265	0.131	0.59	0.65	0.995	0.246	0.99	0.953	0	0.943	0.229	0.003	0	0.031
VIF	1.22	1.343	1.287	3.159	3.462	1.712	1.111	1.626	1.433	1.06	1.019	1.42	1.137	1.133

R-Squared	18.90%
Adjusted R-Squared	15.60%
Regression Sig.	0.00%
Breusch-Pagan Test	51.00%

Dependent Variable	**Interest**

	DEbitdaComp	**ΔCFO**	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**	**SIC4**	**SIC5**
Beta Values	1.013	45.239	-25.439	-17.254	38.763	0	0.02	-3.132	-15.687	0.249	16.068	0	0	0
T Values	2.57	0.677	-1.038	-0.834	1.103	0.77	0.586	-1.268	-1.216	0.659	0.903	-1.161	-0.739	0.687
Significance	0.011	0.499	0.3	0.405	0.271	0.442	0.558	0.205	0.225	0.51	0.367	0.246	0.461	0.493
VIF	1.22	1.343	1.287	3.159	3.462	1.712	1.111	1.626	1.433	1.06	1.019	1.42	1.137	1.133

R-Squared	4.00%
Adjusted R-Squared	0.02%
Regression Sig.	40.10%

Dependent Variable	**CovNum**

	DEbitdaComp	**ΔCFO**	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**	**SIC4**	**SIC5**
Beta Values	0.007	-0.025	-0.103	-0.15	0.358	0	0	-0.178	-0.029	0.002	-0.115	0	0	0
T Values	1.318	-0.028	-0.314	-0.544	0.763	0.107	0.074	-5.394	-0.167	0.367	-0.483	-2.556	-0.031	-0.024
Significance	0.188	0.978	0.754	0.587	0.446	0.915	0.941	0	0.868	0.714	0.629	0.011	0.975	0.981
VIF	1.22	1.343	1.287	3.159	3.462	1.712	1.111	1.626	1.433	1.06	1.019	1.42	1.137	1.133

R-Squared	10.70%
Adjusted R-Squared	7.20%
Regression Sig.	0.00%

Dependent Variable	**CR**

	DEbitdaComp	**ΔCFO**	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	0.003	0.748	-0.249	0.068	-0.237	0	0.003	-0.062	0.11	-0.028	-0.321	0
T Values	1.12	1.01	-0.315	0.26	-0.516	-1.768	4.772	-2.057	0.631	-1.796	-1.101	0.86
Significance	0.268	0.317	0.754	0.796	0.608	0.083	0	0.045	0.531	0.078	0.276	0.394
VIF	1.255	1.553	1.659	3.421	3.602	3.138	1.295	1.826	2.516	1.297	1.093	1.281

R-Squared	51.10%
Adjusted R-Squared	39.60%
Regression Sig.	0.00%

Dependent Variable	**ICR**

	DEbitdaComp	**ΔCFO**	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	-0.008	0.451	-0.268	-0.591	0.595	0	0	0.117	-0.705	0	0.559	0
T Values	-1.14	0.454	-0.78	-1.755	1.073	1.05	0.636	2.937	-3.671	-0.013	2.096	-1.879
Significance	0.255	0.65	0.436	0.08	0.284	0.295	0.525	0.004	0	0.99	0.037	0.061
VIF	1.264	1.304	1.312	3.625	4.013	1.789	1.099	1.684	1.467	1.06	1.016	1.331

R-Squared	12.30%
Adjusted R-Squared	8.50%
Regression Sig.	0.00%

DEbitda - Stage 2 of Two Stage Least Squares - Jones Model

Table 4.2.4.1c

Dependent Variable	**CovThres**

CRhat	**ICRhat**	**Inthat**	**CovNumhat**	**DebitdaComp**	**ΔCFO**	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**Leverage**	**SIC2**	**SIC5**

R-Squared	17.70%

Beta Values	0.158	0.238	-0.05	1.09	0.053	0.4	-0.81	-0.346	1.246	0	0.997	0	0
T Values	0.978	2.713	-3.129	2.451	3.086	0.232	-1.161	-0.637	1.295	0.519	2.495	1.6	2.815
Significance	0.329	0.007	0.002	0.015	0.002	0.817	0.246	0.524	0.196	0.604	0.013	0.111	0.005
VIF	1.421	1.497	6.772	2.739	4.258	1.636	1.915	3.99	4.754	1.927	2.524	1.468	1.377

Adjusted R-Squared	14.70%
Regression Sig.	0.00%
Breusch-Pagan Test	32.40%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DebitdaComp	ϭCFO	ϭTA	AQJones	DEAAQ	LAmount	Leverage	SIC2	SIC5
CovThres	1.000	-.086	.156	-.104	-.090	.156	-.051	.029	.059	.084	.070	.341	.041	.058
CRhat		1.000	-.484	.162	.343	-.128	.219	.004	-.001	-.029	.054	-.153	.002	-.005
ICRhat			1.000	-.116	-.399	.086	-.162	-.085	-.060	.031	-.009	.108	.021	-.033
Inthat				1.000	.563	.517	.278	-.118	.004	.075	.081	-.173	-.176	.329
CovNumhat					1.000	-.010	.339	.122	.039	.002	.230	-.168	-.190	.199
DebitdaComp						1.000	-.083	.010	.066	.092	-.197	.294	-.131	.022
ϭCFO							1.000	.238	.066	.000	.314	-.001	.069	.138
ϭTA								1.000	.235	.339	.102	-.030	.166	-.015
AQJones									1.000	.815	-.019	.037	-.031	.039
DEAAQ										1.000	-.005	.096	.035	.004
LAmount											1.000	.239	.320	.050
Leverage												1.000	-.103	.022
SIC2													1.000	-.214
SIC5														1.000

Dependent Variable | **Interest**

Table 4.2.4.1d

	CRhat	ICRhat	DEbitdahat	CovNumhat	DebitdaComp	ϭCFO	ϭTA	AQJones	DEAAQ
Beta Values	-12.754	-7.343	-7.986	17.148	0.907	63.775	-29.555	-19.87	42.36
T Values	-1.862	-2.001	-1.506	1.281	2.375	1.006	-1.241	-0.977	1.228
Significance	0.063	0.046	0.133	0.201	0.018	0.315	0.215	0.329	0.22
VIF	1.421	1.466	1.267	1.383	1.168	1.236	1.242	3.122	3.406

R-Squared	4.70%
Adjusted R-Squared	2.30%
Regression Sig.	4.30%

Dependent Variable | **CovNum**

Table 4.2.4.1e

	CRhat	ICRhat	DEbitdahat	Inthat	DebitdaComp	ϭCFO	ϭTA	AQJones	DEAAQ	FirmSize	SIC2	SIC5
Beta Values	0.471	0.076	0.058	0.002	0.004	-0.663	0.131	-0.019	0.051	-0.14	0	0
T Values	5.296	1.589	0.519	0.217	0.364	-0.716	0.321	-0.059	0.086	-2.871	-2.352	0.067
Significance	0	0.113	0.604	0.828	0.716	0.474	0.748	0.953	0.931	0.004	0.019	0.946
VIF	1.427	1.481	3.397	9.729	7.185	1.568	2.167	4.439	6.082	3.883	1.357	1.99

R-Squared	17.30%
Adjusted R-Squared	14.50%
Regression Sig.	0.00%

Dependent Variable | **CR**

Table 4.2.4.1f

	ICRhat	DEbitdahat	Inthat	CovNumhat	DebitdaComp	ϭCFO	ϭTA	AQJones	OpCycle	SIC2
Beta Values	0.051	-0.047	-0.013	0.575	0.013	0.683	-0.331	-0.033	0.004	0
T Values	1.581	-0.523	-1.692	2.102	1.731	0.844	-0.431	-0.194	5.836	1.007
Significance	0.12	0.603	0.097	0.04	0.089	0.403	0.668	0.847	0	0.318
VIF	1.153	1.915	11.639	4.382	8.361	1.864	1.564	1.454	1.177	1.237

R-Squared	49.50%
Adjusted R-Squared	40.00%
Regression Sig.	0.00%

Dependent Variable | **ICR**

Table 4.2.4.1g

	CRhat	DEbitdahat	Inthat	CovNumhat	DebitdaComp	ϭCFO	ϭTA	AQJones	DEAAQ	Leverage	SIC2
Beta Values	-0.314	-0.412	0.008	-0.718	-0.008	0.074	-0.099	-0.452	0.554	0.143	0
T Values	-2.468	-3.024	0.879	-2.604	-0.78	0.069	-0.25	-1.311	0.939	0.538	-1.898
Significance	0.014	0.003	0.38	0.01	0.436	0.945	0.803	0.191	0.348	0.591	0.059
VIF	1.097	3.719	4.625	2.333	2.905	1.581	1.849	4.017	4.788	2.966	1.286

R-Squared	16.50%
Adjusted R-Squared	13.20%
Regression Sig.	0.00%

DEBT TO EBITDA RATIO (DEBITDA) FINANCIAL COVENANT – MODIFIED JONES MODEL ANALYSIS

Debt to EBITDA (DEbitda) Ratio Covenant - Modified Jones Model - Descriptives - Table 4.2.4.2a

		CovThres	DEbitdaComp	ϭCFO	ϭTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	368	368	368	368	368	368	368	368	368	368	368	368	368	368
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.28	5.15	0.061	0.074	0.204	0.034	658,170	124.046	6.257	0.647	2.516	0.033	202.989	2.935
Median		4	4.381	0.05	0.048	0.062	0	467,933	107.254	6.262	0.626	1.926	0	200	3
Std. Deviation		1.516	8.783	0.054	0.145	0.266	0.185	892,488	98.488	1.62	0.293	8.547	0.178	60.012	0.833
Skewness		1.65	-1.334	6.351	12.046	1.19	0.818	11	5.991	-0.038	1.367	-3.957	5.285	0.494	0.949
Std. Error of Skewness		0.127	0.127	0.127	0.127	0.127	0.127	0	0.127	0.127	0.127	0.127	0.127	0.127	0.127
Kurtosis		7.492	66.433	65.227	178.204	0.291	6.998	166	63.528	-0.21	4.758	55.07	26.069	9.631	2.102
Std. Error of Kurtosis		0.254	0.254	0.254	0.254	0.254	0.254	0	0.254	0.254	0.254	0.254	0.254	0.254	0.254
Minimum		0.4	-93.789	0.006	0.01	0	-0.968	5,791	7.639	0.382	0.066	-97.094	0	0	1
Maximum		15	86.57	0.726	2.373	0.975	0.804	14,675,768	1316.473	10.331	2.412	42.614	1	500	7
Percentiles	25	3.5	2.713	0.032	0.032	0	0	264,861	72.667	5.104	0.455	0.982	0	200	2
	50	4	4.381	0.05	0.048	0.062	0	467,933	107.254	6.262	0.626	1.926	0	200	3
	75	5	6.851	0.071	0.074	0.347	0.028	795,622	157.281	7.405	0.78	3.442	0	200	3

Debt to EBITDA (DEbitda) Ratio Covenant - Tests of Normality - Modified Jones Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.127	367	0	0.907	367	0
DEbitdaComp	0.278	367	0	0.473	367	0
ϭCFO	0.184	367	0	0.569	367	0
ϭTA	0.331	367	0	0.26	367	0
AQModJones	0.23	367	0	0.776	367	0
DEAAQ	0.268	367	0	0.738	367	0
LAmount	0.238	367	0	0.415	367	0
OpCycle	0.13	367	0	0.639	367	0
FirmSize	0.036	367	.200*	0.995	367	0.239
Leverage	0.081	367	0	0.924	367	0
Growth	0.305	367	0	0.523	367	0
Recession	0.54	367	0	0.169	367	0
Interest	0.438	367	0	0.484	367	0
CovNum	0.257	367	0	0.823	367	0

DEbitda - Stage 1 of Two Stage Least Squares - Modified Jones Model

Dependent Variable	CovThres												
	DEbitdaComp	ϭCFO	ϭTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	0.01	-1.927	0.548	-0.044	0.768	0	0	0.003	1.648	0.002	-0.535	0	0	0
T Values	1.06	-1.241	0.988	-0.144	1.759	-1.191	-0.1	0.053	5.515	0.211	-1.301	2.994	4.503	2.219
Significance	0.29	0.215	0.324	0.885	0.08	0.235	0.92	0.958	0	0.833	0.194	0.003	0	0.027
VIF	1.221	1.355	1.231	1.244	1.243	1.717	1.112	1.601	1.438	1.054	1.02	1.407	1.137	1.134

R-Squared	19.50%
Adjusted R Squared	16.30%
Regression Sig.	0.00%
Breusch-Pagan Test	56.70%

Dependent Variable	Interest												
	DEbitdaComp	ϭCFO	ϭTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	1.013	39.531	-15.838	-0.399	5.59	0	0.02	-2.801	-15.068	0.211	16.944	0	0	0
T Values	2.564	0.588	-0.66	-0.03	0.296	0.796	0.583	-1.141	-1.164	0.561	0.951	-1.057	-0.706	0.711
Significance	0.011	0.557	0.51	0.976	0.768	0.427	0.56	0.255	0.245	0.575	0.342	0.291	0.481	0.478
VIF	1.221	1.355	1.231	1.244	1.243	1.717	1.112	1.601	1.438	1.054	1.02	1.407	1.137	1.134

R-Squared	3.70%
Adjusted R Squared	0.00%
Regression Sig.	48.50%

Dependent Variable	CovNum												
	DEbitdaComp	ϭCFO	ϭTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	0.007	-0.037	0.034	-0.093	0.088	0	0	-0.175	-0.021	0.001	-0.112	0	0	0
T Values	1.331	-0.042	0.106	-0.526	0.348	0.09	0.011	-5.332	-0.122	0.284	-0.471	-2.485	-0.007	0.011
Significance	0.184	0.967	0.916	0.599	0.728	0.929	0.991	0	0.903	0.777	0.638	0.013	0.994	0.991

R-Squared	10.70%
Adjusted R Squared	7.10%
Regression Sig.	0.00%

VIF	1.221	1.355	1.231	1.244	1.243	1.717	1.112	1.601	1.438	1.054	1.02	1.407	1.137	1.134

Dependent Variable	CR											
	DEbitdaComp	ΔCFO	ΔTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.003	0.756	-0.612	0.069	0.089	0	0.003	-0.062	0.063	-0.033	-0.337	0
T Values	1.209	0.971	-0.777	0.418	0.367	-1.559	4.68	-2.066	0.36	-2.033	-1.156	0.879
Significance	0.232	0.336	0.441	0.678	0.715	0.125	0	0.044	0.72	0.047	0.253	0.384
VIF	1.241	1.715	1.642	1.449	1.339	3.223	1.285	1.844	2.524	1.341	1.094	1.321

R-Squared	51.10%
Adjusted R-Squared	39.60%
Regression Sig.	0.00%

Dependent Variable	ICR											
	DEbitdaComp	ΔCFO	ΔTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	-0.008	0.245	-0.206	-0.194	-0.104	0	0	0.126	-0.685	-0.001	0.573	0
T Values	-1.101	0.242	-0.612	-0.961	-0.37	1.107	0.626	3.191	-3.543	-0.165	2.139	-1.709
Significance	0.272	0.809	0.541	0.337	0.712	0.269	0.532	0.002	0	0.869	0.033	0.089
VIF	1.268	1.339	1.25	1.236	1.293	1.789	1.098	1.632	1.478	1.056	1.017	1.315

R-Squared	11.60%
Adjusted R-Squared	7.80%
Regression Sig.	0.00%

DEbitda - Stage 2 of Two Stage Least Squares - Modified Jones Model

Table 4.2.4.2b

Dependent Variable	CovThres													
	CRhat	ICRhat	Inthat	CovNumhat	DebitdaComp	ΔCFO	ΔTA	AQModJones	DEAAQ	Leverage	OpCycle	SIC2	SIC4	SIC5
Beta Values	0.196	0.225	-0.03	0.674	0.036	-0.972	0.12	0.022	0.917	1.176	0	0	0	0
T Values	1.236	2.638	-1.81	1.487	2.244	-0.555	0.191	0.074	2.094	3.577	0.594	2.521	3.376	2.772
Significance	0.217	0.009	0.071	0.138	0.025	0.579	0.848	0.941	0.037	0	0.553	0.012	0.001	0.006
VIF	1.418	1.474	7.083	2.936	3.911	1.754	1.593	1.257	1.275	1.772	1.215	1.24	1.29	1.46

R-Squared	20.90%
Adjusted R-Squared	17.80%
Regression Sig.	0.00%
Breusch-Pagan Test	43.90%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DebitdaComp	ΔCFO	ΔTA	AQModJones	DEAAQ	Leverage	OpCycle	SIC2	SIC4	SIC5
CovThres	1.000	-.088	.156	-.103	-.088	.156	-.051	.029	.054	.122	.341	-.043	.041	.218	.058
CRhat		1.000	-.483	.154	.338	-.128	.219	.004	-.016	-.067	-.153	.042	.002	-.080	-.005
ICRhat			1.000	-.145	-.409	.086	-.162	-.085	-.045	-.002	.108	.009	.021	.053	-.033
Inthat				1.000	.555	.538	.289	-.123	-.020	.056	-.181	.181	-.183	-.181	.342
CovNumhat					1.000	-.010	.340	.123	-.058	-.078	-.168	.014	-.191	.049	.200
DebitdaComp						1.000	-.083	.010	.075	.107	.294	.013	-.131	-.015	.022
ΔCFO							1.000	.238	.063	-.190	-.001	.080	.069	.114	.138
ΔTA								1.000	.240	-.167	-.030	-.040	.166	-.004	-.015
AQModJones									1.000	.294	.053	-.117	-.016	-.005	.037
DEAAQ										1.000	.133	-.026	-.058	-.040	-.031
Leverage											1.000	-.102	-.103	.140	.022
OpCycle												1.000	.189	-.091	-.128
SIC2													1.000	-.156	-.214
SIC4														1.000	-.060
SIC5															1.000

Dependent Variable	Interest									
	CRhat	ICRhat	DEbitdahat	CovNumhat	DebitdaComp	ΔCFO	ΔTA	AQModJones	DEAAQ	LAmount
Beta Values	-11.139	-6.958	-8.838	12.589	1.003	45.617	-18.571	-0.817	7.935	0
T Values	-1.627	-1.881	-1.561	0.898	2.498	0.69	-0.786	-0.063	0.413	0.75
Significance	0.105	0.061	0.119	0.37	0.013	0.491	0.432	0.95	0.68	0.454
VIF	1.409	1.471	1.481	1.494	1.284	1.332	1.213	1.236	1.304	1.344

Table 4.2.4.2c

R-Squared	4.30%
Adjusted R-Squared	1.60%
Regression Sig.	11.00%

Table 4.2.4.2d

Dependent Variable	CovNum											
	CRhat	ICRhat	DEbitdahat	Inthat	DebitdaComp	ΔCFO	ΔTA	AQModJones	DEAAQ	FirmSize	Leverage	Growth	SIC2
Beta Values	0.475	0.079	0.083	0.001	0.006	-0.522	0.161	-0.086	0.055	-0.144	-0.08	0.001	0

R-Squared	17.40%
Adjusted R-Squared	14.30%

T Values	5.355	1.653	0.669	0.126	0.536	-0.554	0.476	-0.511	0.202	-3.129	-0.333	0.225	-2.439
Significance	0	0.099	0.504	0.899	0.592	0.58	0.634	0.61	0.84	0.002	0.74	0.822	0.015
VIF	1.417	1.471	4.261	6.426	5.34	1.623	1.494	1.231	1.562	3.426	3.005	1.285	1.472

Regression Sig.	0.00%

Table 4.2.4.2e

Dependent Variable	**CR**										
	ICRhat	**DEbitdahat**	**Inthat**	**CovNumhat**	**DebitdaComp**	**ϭCFO**	**ϭTA**	**AQModJones**	**DEAAQ**	**OpCycle**	**Growth**
Beta Values	0.039	-0.053	-0.014	0.594	0.013	0.74	-0.85	0.13	0.087	0.004	-0.014
T Values	1.168	-0.537	-1.647	2.092	1.643	0.873	-1.057	0.77	0.343	5.691	-0.926
Significance	0.248	0.594	0.105	0.041	0.106	0.387	0.295	0.445	0.733	0	0.359
VIF	1.23	1.997	12.954	4.577	9.775	1.994	1.678	1.484	1.424	1.182	1.246

R-Squared	49.20%
Adjusted R-Squared	38.40%
Regression Sig.	0.00%

Table 4.2.4.2f

Dependent Variable	**ICR**											
	CRhat	**DEbitdahat**	**Inthat**	**CovNumhat**	**DebitdaComp**	**ϭCFO**	**ϭTA**	**AQModJones**	**DEAAQ**	**Leverage**	**OpCycle**	**Growth**
Beta Values	-0.34	-0.495	0.005	-0.62	-0.004	-0.093	-0.057	-0.232	0.212	0.298	0	0.001
T Values	-2.642	-3.656	0.538	-2.237	-0.328	-0.086	-0.156	-1.167	0.699	1.181	-0.317	0.216
Significance	0.009	0	0.591	0.026	0.743	0.932	0.876	0.244	0.485	0.238	0.752	0.829
VIF	1.105	3.796	5.289	2.306	3.211	1.623	1.511	1.243	1.569	2.622	1.102	1.258

R-Squared	15.10%
Adjusted R-Squared	11.40%
Regression Sig.	0.00%

DEBT TO EBITDA RATIO FINANCIAL COVENANT – PEASNELL MODEL ANALYSIS

Debt to EBITDA (DEbitda) Ratio Covenant - Peasnell Model - Descriptives - Table 4.2.4.3a

		CovThres	**DEbitdaComp**	**ϭCFO**	**ϭWCA**	**AQPeasnell**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	368	368	368	368	368	368	368	368	368	368	368	368	368	368
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.28	5.15	0.061	0.095	0.308	0.128	658,170	124.046	6.257	0.647	2.516	0.033	202.989	2.935
Median		4	4.381	0.05	0.052	0.198	0.035	467,933	107.254	6.262	0.626	1.926	0	200	3
Std. Deviation		1.516	8.783	0.054	0.305	0.32	0.189	892,488	98.488	1.62	0.293	8.547	0.178	60.012	0.833
Skewness		1.65	-1.334	6.351	15.254	0.64	1.985	11	5.991	-0.038	1.367	-3.957	5.285	0.494	0.949
Std. Error of Skewness		0.127	0.127	0.127	0.127	0.127	0.127	0	0.127	0.127	0.127	0.127	0.127	0.127	0.127
Kurtosis		7.492	66.433	65.227	260.793	-0.955	3.868	166	63.528	-0.21	4.758	55.07	26.069	9.631	2.102
Std. Error of Kurtosis		0.254	0.254	0.254	0.254	0.254	0.254	0	0.254	0.254	0.254	0.254	0.254	0.254	0.254
Minimum		0.4	-93.789	0.006	0.004	0	0	5,791	7.639	0.382	0.066	-97.094	0	0	1
Maximum		15	86.57	0.726	5.438	1	0.999	14,675,768	1316.473	10.331	2.412	42.614	1	500	7
Percentiles	25	3.5	2.713	0.032	0.031	0	0	264,861	72.667	5.104	0.455	0.982	0	200	2
	50	4	4.381	0.05	0.052	0.198	0.035	467,933	107.254	6.262	0.626	1.926	0	200	3
	75	5	6.851	0.071	0.089	0.555	0.183	795,622	157.281	7.405	0.78	3.442	0	200	3

Debt to EBITDA (DEbitda) Ratio Covenant - Tests of Normality - Peasnell Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.127	367	0	0.907	367	0
DEbitdaComp	0.278	367	0	0.473	367	0
ϭCFO	0.184	367	0	0.569	367	0
ϭWCA	0.384	367	0	0.157	367	0
AQPeasnell	0.174	367	0	0.854	367	0
DEAAQ	0.249	367	0	0.718	367	0
LAmount	0.238	367	0	0.415	367	0
OpCycle	0.13	367	0	0.639	367	0
FirmSize	0.036	367	.200*	0.995	367	0.239

Leverage	0.081	367	0	0.924	367	0
Growth	0.305	367	0	0.523	367	0
Recession	0.54	367	0	0.169	367	0
Interest	0.438	367	0	0.484	367	0
CovNum	0.257	367	0	0.823	367	0

DEbitda - Stage 1 of Two Stage Least Squares - Peasnell Model

Dependent Variable	CovThres													
	DEbitdaComp	ƟCFO	ƟWCA	AQPeasnell	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	0.011	-1.969	0.021	0.22	-0.513	0	0	0.004	1.704	0	-0.473	0	0	0
T Values	1.228	-1.28	0.077	0.646	-0.855	-1.212	-0.197	0.079	5.695	-0.03	-1.127	3.138	4.43	2.145
Significance	0.22	0.201	0.939	0.518	0.393	0.226	0.844	0.937	0	0.976	0.261	0.002	0	0.033
VIF	1.217	1.316	1.278	2.226	2.43	1.71	1.137	1.619	1.429	1.049	1.051	1.449	1.139	1.131

R-Squared	18.80%
Adjusted R-Squared	15.50%
Regression Sig.	0.00%
Breusch-Pagan Test	65.40%

Dependent Variable	Interest													
	DEbitdaComp	ƟCFO	ƟWCA	AQPeasnell	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	1	28.087	-2.938	-15.028	20.889	0	0.026	-2.792	-15.252	0.205	17.342	0	0	0
T Values	2.536	0.424	-0.253	-1.026	0.808	0.793	0.756	-1.132	-1.183	0.544	0.959	-1.171	-0.748	0.737
Significance	0.012	0.672	0.801	0.306	0.42	0.429	0.45	0.258	0.238	0.586	0.338	0.242	0.455	0.462
VIF	1.217	1.316	1.278	2.226	2.43	1.71	1.137	1.619	1.429	1.049	1.051	1.449	1.139	1.131

R-Squared	3.80%
Adjusted R-Squared	0.00%
Regression Sig.	45.00%

Dependent Variable	CovNum													
	DEbitdaComp	ƟCFO	ƟWCA	AQPeasnell	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	0.007	-0.128	0.066	0.215	-0.351	0	0	-0.171	-0.011	0.001	-0.087	0	0	0
T Values	1.323	-0.145	0.425	1.102	-1.019	0.166	0.002	-5.198	-0.065	0.276	-0.361	-2.449	0.016	-0.012
Significance	0.187	0.885	0.671	0.271	0.309	0.868	0.998	0	0.948	0.783	0.718	0.015	0.987	0.99
VIF	1.217	1.316	1.278	2.226	2.43	1.71	1.137	1.619	1.429	1.049	1.051	1.449	1.139	1.131

R-Squared	10.90%
Adjusted R-Squared	7.40%
Regression Sig.	0.00%

Dependent Variable	CR										
	DEbitdaComp	ƟCFO	ƟWCA	AQPeasnell	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.004	0.92	-0.528	0.293	-0.209	0	0.003	-0.058	0.065	-0.031	-0.317	0
T Values	1.303	1.33	-0.856	1.602	-0.632	-1.568	4.359	-2.021	0.403	-2.012	-1.105	1.286
Significance	0.198	0.189	0.396	0.115	0.53	0.123	0	0.049	0.689	0.05	0.274	0.204
VIF	1.218	1.425	1.608	2.384	2.698	3.045	1.343	1.764	2.323	1.315	1.116	1.279

R-Squared	53.60%
Adjusted R-Squared	42.70%
Regression Sig.	0.00%

Dependent Variable	ICR											
	DEbitdaComp	ƟCFO	ƟWCA	AQPeasnell	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	-0.008	0.199	0.037	0.053	-0.315	0	0	0.135	-0.702	-0.001	0.629	0
T Values	-1.204	0.2	0.224	0.233	-0.788	1.221	0.91	3.378	-3.635	-0.109	2.286	-1.76
Significance	0.23	0.842	0.823	0.816	0.431	0.223	0.363	0.001	0	0.913	0.023	0.079
VIF	1.262	1.289	1.338	2.34	2.606	1.781	1.128	1.654	1.466	1.047	1.068	1.349

R-Squared	11.20%
Adjusted R-Squared	7.40%
Regression Sig.	0.01%

DEbitda - Stage 2 of Two Stage Least Squares - Peasnell Model

Table 4.2.4.3b

Dependent Variable	CovThres											
	CRhat	ICRhat	Inthat	CovNumhat	DEbitdaComp	ƟCFO	ƟWCA	AQPeasnell	DEAAQ	LAmount	Leverage	SIC2	SIC5
Beta Values	0.144	0.249	-0.053	1.188	0.054	0.265	-0.247	-0.846	1.066	0.001	1.052	0	0
T Values	0.895	2.872	-3.386	2.604	3.486	0.166	-0.858	-1.846	1.362	1.044	3.143	1.832	2.978

R-Squared	18.00%
Adjusted R-Squared	15.00%
Regression Sig.	0.00%

Significance	0.371	0.004	0.001	0.01	0.001	0.869	0.392	0.066	0.174	0.297	0.002	0.068	0.003
VIF	1.421	1.463	6.291	2.951	3.506	1.418	1.447	4.02	4.114	1.341	1.778	1.25	1.48

Breusch-Pagan Test	50.30%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DEbitdaComp	ϬCFO	ϬWCA	AQPeasnell	DEAAQ	LAmount	Leverage	SIC2	SIC5
CovThres	1.000	-.087	.162	-.110	-.083	.156	-.051	-.004	-.031	-.031	-.043	.341	.041	.058
CRhat		1.000	-.488	.121	.340	-.128	.219	-.012	.072	.000	.042	-.153	.002	-.009
ICRhat			1.000	-.129	-.408	.086	-.162	-.042	-.045	.006	.009	.109	.022	-.033
Inthat				1.000	.484	.529	.284	-.002	-.106	.050	.178	-.178	-.180	.336
CovNumhat					1.000	-.010	.336	.135	.050	-.131	.014	-.166	-.188	.198
DEbitdaComp						1.000	-.083	.004	.025	.050	.013	.294	-.131	.022
ϬCFO							1.000	.213	.065	.094	.080	-.001	.069	.138
ϬWCA								1.000	.232	.349	-.024	-.030	.227	-.001
AQPeasnell									1.000	.731	.187	-.048	.081	-.039
DEAAQ										1.000	.125	.014	.141	-.054
LAmount											1.000	-.102	.189	-.128
Leverage												1.000	-.103	.022
SIC2													1.000	-.214
SIC5														1.000

Table 4.2.4.3c

Dependent Variable	Interest

	CRhat	ICRhat	DEbitdahat	CovNumhat	DEbitdaComp	ϬCFO	ϬWCA	AQPeasnell	OpCycle	SIC2
Beta Values	-11.172	-7.193	-8.09	11.417	0.944	49.185	-3.11	-6.918	0.019	0
T Values	-1.623	-1.959	-1.517	0.833	2.418	0.781	-0.277	-0.674	0.577	0.025
Significance	0.105	0.051	0.13	0.406	0.016	0.435	0.782	0.501	0.564	0.98
VIF	1.425	1.446	1.265	1.466	1.213	1.206	1.205	1.11	1.113	1.231

R-Squared	4.10%
Adjusted R-Squared	1.50%
Regression Sig.	12.40%

Table 4.2.4.3d

Dependent Variable	CovNum

	CRhat	ICRhat	DEbitdahat	Inthat	DEbitdaComp	ϬCFO	ϬWCA	AQPeasnell	DEAAQ	FirmSize	Leverage	Growth	SIC2
Beta Values	0.48	0.082	0.082	0.002	0.005	-0.607	0.146	0.149	-0.312	-0.139	-0.061	0.001	0
T Values	5.398	1.717	0.65	0.213	0.477	-0.689	0.958	0.695	-0.835	-3.065	-0.246	0.192	-2.318
Significance	0	0.087	0.516	0.832	0.634	0.491	0.339	0.487	0.404	0.002	0.806	0.848	0.021
VIF	1.43	1.469	4.295	6.034	5.015	1.422	1.347	2.895	3.091	3.326	3.175	1.225	1.585

R-Squared	17.70%
Adjusted R-Squared	14.70%
Regression Sig.	0.00%

Table 4.2.4.3e

Dependent Variable	CR

	ICRhat	DEbitdahat	Inthat	CovNumhat	DEbitdaComp	ϬCFO	ϬWCA	AQPeasnell	OpCycle	Growth	SIC2
Beta Values	0.055	-0.037	-0.008	0.436	0.009	0.608	-0.538	0.17	0.003	-0.015	0
T Values	1.684	-0.402	-1.12	1.95	1.258	0.865	-0.941	1.041	5.02	-1.009	1.708
Significance	0.098	0.689	0.268	0.057	0.214	0.391	0.351	0.303	0	0.318	0.094
VIF	1.301	2.103	9.799	3.019	7.756	1.496	1.404	1.924	1.28	1.258	1.262

R-Squared	53.40%
Adjusted R-Squared	43.50%
Regression Sig.	0.00%

Table 4.2.4.3f

Dependent Variable	ICR

	CRhat	DEbitdahat	Inthat	CovNumhat	DEbitdaComp	ϬCFO	ϬWCA	AQPeasnell	DEAAQ	Growth	Leverage	SIC2
Beta Values	-0.335	-0.429	0.008	-0.831	-0.008	0.06	0.09	0.446	-0.998	0.001	0.215	0
T Values	-2.589	-2.999	0.881	-2.909	-0.721	0.059	0.526	1.622	-2.065	0.131	0.798	-1.689
Significance	0.01	0.003	0.379	0.004	0.472	0.953	0.6	0.106	0.04	0.896	0.425	0.092
VIF	1.098	4.048	4.843	2.554	3.145	1.427	1.524	3.617	4.005	1.197	3.008	1.334

R-Squared	15.50%
Adjusted R-Squared	11.90%
Regression Sig.	0.00%

DEBT TO EBITDA (DEBITDA) RATIO FINANCIAL COVENANT – DECHOW AND DICHEV (DD) MODEL ANALYSIS

Debt to EBITDA (DEbitda) Ratio Covenant - Dechow and Dichev (DD) Model - Descriptives - Table 4.2.4.4a

		CovThres	DEbitdaComp	ϬCFO	ϬWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	368	368	368	368	368	368	368	368	368	368	368	368	368	368
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Mean		4.28	5.15	0.061	0.073	0.25	0.1	658,170	124.046	6.257	0.647	2.516	0.033	202.989	2.935
Median		4	4.381	0.05	0.055	0.119	0.022	467,933	107.254	6.262	0.626	1.926	0	200	3
Std. Deviation		1.516	8.783	0.054	0.06	0.284	0.153	892,488	98.488	1.62	0.293	8.547	0.178	60.012	0.833
Skewness		1.65	-1.334	6.351	1.895	0.72	1.834	11	5.991	-0.038	1.367	-3.957	5.285	0.494	0.949
Std. Error of Skewness		0.127	0.127	0.127	0.127	0.127	0.127	0	0.127	0.127	0.127	0.127	0.127	0.127	0.127
Kurtosis		7.492	66.433	65.227	4.611	-0.914	3.009	166	63.528	-0.21	4.758	55.07	26.069	9.631	2.102
Std. Error of Kurtosis		0.254	0.254	0.254	0.254	0.254	0.254	0	0.254	0.254	0.254	0.254	0.254	0.254	0.254
Minimum		0.4	-93.789	0.006	0.008	0	0	5,791	7.639	0.382	0.066	-97.094	0	0	1
Maximum		15	86.57	0.726	0.384	0.97	0.795	14,675,768	1316.473	10.331	2.412	42.614	1	500	7
Percentiles	25	3.5	2.713	0.032	0.032	0	0	264,861	72.667	5.104	0.455	0.982	0	200	2
	50	4	4.381	0.05	0.055	0.119	0.022	467,933	107.254	6.262	0.626	1.926	0	200	3
	75	5	6.851	0.071	0.096	0.491	0.145	795,622	157.281	7.405	0.78	3.442	0	200	3

Debt to EBITDA (DEbitda) Ratio Covenant - Tests of Normality - DD Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.127	367	0	0.907	367	0
DEbitdaComp	0.278	367	0	0.473	367	0
ϬCFO	0.184	367	0	0.569	367	0
ϬWC	0.138	367	0	0.825	367	0
AQDD	0.225	367	0	0.82	367	0
DEAAQ	0.256	367	0	0.711	367	0
LAmount	0.238	367	0	0.415	367	0
OpCycle	0.13	367	0	0.639	367	0
FirmSize	0.036	367	.200*	0.995	367	0.239
Leverage	0.081	367	0	0.924	367	0
Growth	0.305	367	0	0.523	367	0
Recession	0.54	367	0	0.169	367	0
Interest	0.438	367	0	0.484	367	0
CovNum	0.257	367	0	0.823	367	0

DEbitda - Stage 1 of Two Stage Least Squares - DD Model

Dependent Variable	**CovThres**												
	DEbitdaComp	**ϬCFO**	**ϬWC**	**AQDD**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**	**SIC4**	**SIC5**
Beta Values	0.011	-2.349	1.892	0.38	-1.757	0	0	0.011	1.661	0.002	-0.352	0	0	0
T Values	1.227	-1.531	1.473	0.925	-2.296	-1.153	-0.335	0.203	5.607	0.289	-0.856	3.089	4.549	1.978
Significance	0.221	0.127	0.142	0.356	0.022	0.25	0.738	0.839	0	0.773	0.393	0.002	0	0.049
VIF	1.225	1.342	1.129	2.634	2.628	1.715	1.089	1.623	1.434	1.053	1.033	1.405	1.146	1.148

R-Squared	20.60%
Adjusted R-Squared	17.50%
Regression Sig.	0.00%
Breusch-Pagan Test	14.80%

Dependent Variable	**Interest**												
	DEbitdaComp	**ϬCFO**	**ϬWC**	**AQDD**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**	**SIC4**	**SIC5**
Beta Values	0.973	29.277	-37.096	-32.974	65.031	0	0.026	-3.223	-13.141	0.163	15.07	0	0	0
T Values	2.471	0.44	-0.666	-1.847	1.959	0.846	0.77	-1.311	-1.023	0.435	0.845	-1.327	-0.836	0.966
Significance	0.014	0.66	0.506	0.066	0.051	0.398	0.442	0.191	0.307	0.663	0.399	0.185	0.404	0.335
VIF	1.225	1.342	1.129	2.634	2.628	1.715	1.089	1.623	1.434	1.053	1.033	1.405	1.146	1.148

R-Squared	4.70%
Adjusted R-Squared	0.09%
Regression Sig.	24.00%

Dependent Variable	**CovNum**												
	DEbitdaComp	**ϬCFO**	**ϬWC**	**AQDD**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**	**SIC4**	**SIC5**
Beta Values	0.007	-0.1	-0.067	-0.295	0.134	0	0	-0.18	-0.009	0.002	-0.075	0	0	0
T Values	1.315	-0.112	-0.09	-1.235	0.302	0.169	0.067	-5.471	-0.051	0.33	-0.314	-2.662	-0.113	0.092
Significance	0.189	0.911	0.928	0.218	0.762	0.866	0.946	0	0.96	0.741	0.754	0.008	0.91	0.926
VIF	1.225	1.342	1.129	2.634	2.628	1.715	1.089	1.623	1.434	1.053	1.033	1.405	1.146	1.148

R-Squared	11.30%
Adjusted R-Squared	7.70%
Regression Sig.	0.00%

Dependent Variable	**CR**

	DEbitdaComp	ϬCFO	ϬWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.002	0.586	-0.349	-0.331	0.433	0	0.003	-0.075	0.153	-0.03	-0.334	0
T Values	0.708	0.846	-0.474	-1.575	1.388	-1.838	4.874	-2.464	0.899	-1.933	-1.158	0.603
Significance	0.482	0.401	0.637	0.121	0.171	0.072	0	0.017	0.373	0.059	0.252	0.549
VIF	1.316	1.409	1.358	3.579	3.202	3.274	1.427	1.951	2.5	1.275	1.109	1.333

R-Squared	52.80%
Adjusted R-Squared	41.70%
Regression Sig.	0.00%

Dependent Variable	ICR

	DEbitdaComp	ϬCFO	ϬWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	-0.01	-0.073	0.8	0.269	0.104	0	0	0.138	-0.707	0	0.532	0
T Values	-1.429	-0.073	0.948	0.935	0.191	1.2	0.939	3.487	-3.675	-0.023	1.974	-1.919
Significance	0.154	0.942	0.344	0.351	0.848	0.231	0.348	0.001	0	0.981	0.049	0.056
VIF	1.279	1.299	1.137	2.736	2.75	1.809	1.079	1.64	1.47	1.052	1.039	1.323

R-Squared	12.20%
Adjusted R-Squared	8.50%
Regression Sig.	0.00%

DEbitda - Stage 2 of Two Stage Least Squares - DD Model

Table 4.2.4.4b

Dependent Variable	CovThres

	CRhat	ICRhat	Inthat	CovNumhat	DebitdaComp	ϬCFO	ϬWC	AQDD	DEAAQ	Leverage	SIC2	SIC5
Beta Values	0.17	0.224	-0.049	1.111	0.051	0.065	-0.545	-0.926	1.362	1.161	0	0
T Values	1.067	2.629	-3.354	2.475	3.443	0.04	-0.392	-1.664	1.135	3.723	1.891	2.988
Significance	0.287	0.009	0.001	0.014	0.001	0.968	0.696	0.097	0.257	0	0.059	0.003
VIF	1.412	1.453	6.969	2.994	3.174	1.44	1.312	4.767	6.385	1.572	1.158	1.561

R-Squared	19.30%
Adjusted R-Squared	16.60%
Regression Sig.	0.00%
Breusch-Pagan Test	7.10%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DebitdaComp	ϬCFO	ϬWC	AQDD	DEAAQ	Leverage	SIC2	SIC5
CovThres	1.000	-.089	.153	-.142	-.078	.156	-.051	.052	-.080	-.128	.341	.041	.058
CRhat		1.000	-.479	.163	.322	-.128	.219	.092	.079	.109	-.153	.002	-.010
ICRhat			1.000	-.134	-.387	.086	-.162	-.035	-.082	-.048	.108	.021	-.033
Inthat				1.000	.526	.477	.256	-.012	-.032	.251	-.160	-.162	.303
CovNumhat					1.000	-.010	.331	.134	-.135	-.144	-.164	-.186	.195
DebitdaComp						1.000	-.083	.064	-.011	.031	.294	-.131	.022
ϬCFO							1.000	.259	.048	.043	-.001	.069	.138
ϬWC								1.000	.002	.038	.017	.104	.013
AQDD									1.000	.773	.020	-.055	.077
DEAAQ										1.000	.006	.012	-.029
Leverage											1.000	-.103	.022
SIC2												1.000	-.214
SIC5													1.000

Dependent Variable	Interest

Table 4.2.4.4c

	CRhat	ICRhat	DEbitdahat	CovNumhat	DebitdaComp	ϬCFO	ϬWC	AQDD	DEAAQ	Leverage	SIC2	SIC5
Beta Values	-11.934	-7.161	-10.668	15.308	0.911	29.38	-16.376	-26.751	51.635	5.955	0	0
T Values	-1.745	-1.972	-1.171	1.104	2.324	0.446	-0.291	-1.502	1.436	0.311	0.321	1.277
Significance	0.082	0.049	0.243	0.27	0.021	0.656	0.771	0.134	0.152	0.756	0.749	0.203
VIF	1.42	1.436	4.099	1.558	1.233	1.335	1.168	2.662	3.13	3.23	1.345	1.228

R-Squared	5.70%
Adjusted R-Squared	2.50%
Regression Sig.	5.10%

Dependent Variable	CovNum

Table 4.2.4.4d

	CRhat	ICRhat	DEbitdahat	Inthat	DebitdaComp	ϬCFO	ϬWC	AQDD	DEAAQ	FirmSize	SIC2
Beta Values	0.475	0.066	0.065	0.003	0.004	-0.54	-0.179	-0.14	-0.222	-0.139	0
T Values	5.394	1.396	0.785	0.431	0.455	-0.628	-0.238	-0.462	-0.387	-3.192	-2.219
Significance	0	0.164	0.433	0.667	0.649	0.53	0.812	0.644	0.699	0.002	0.027
VIF	1.418	1.451	2.039	5.546	3.897	1.367	1.246	4.614	4.804	3.115	1.447

R-Squared	18.00%
Adjusted R-Squared	15.50%
Regression Sig.	0.00%

Table 4.2.4.4e

Dependent Variable	CR	ICRhat	DEbitdahat	Inthat	CovNumhat	DebitdaComp	ϬCFO	ϬWC	AQDD	DEAAQ	OpCycle	Growth
Beta Values		0.035	0.015	-0.012	0.596	0.009	0.599	-0.856	-0.498	1.048	0.004	-0.015
T Values		1.052	0.163	-1.481	2.113	1.171	0.82	-1.112	-1.954	2.06	5.809	-1.005
Significance		0.298	0.871	0.145	0.039	0.247	0.416	0.271	0.056	0.044	0	0.32
VIF		1.293	2.488	15.344	4.656	9.016	1.517	1.443	5.099	8.276	1.322	1.186

R-Squared	50.40%
Adjusted R-Squared	39.90%
Regression Sig.	0.00%

Table 4.2.4.4f

Dependent Variable	ICR	CRhat	DEbitdahat	Inthat	CovNumhat	DebitdaComp	ϬCFO	ϬWC	AQDD	DEAAQ	FirmSize	Leverage
Beta Values		-0.338	-0.412	0.007	0.007	-0.014	-0.269	1.709	0.546	-0.818	0.148	0.133
T Values		-2.657	-3.061	0.81	0.016	-1.335	-0.265	1.943	1.616	-1.17	2.112	0.509
Significance		0.008	0.002	0.418	0.987	0.183	0.791	0.053	0.107	0.243	0.036	0.611
VIF		1.107	3.908	4.635	6.217	2.872	1.431	1.297	3.979	4.743	5.465	2.862

R-Squared	16.20%
Adjusted R-Squared	12.90%
Regression Sig.	0.00%

DEBT TO EBITDA (DEBITDA) RATIO FINANCIAL COVENANT – MCNICHOLS MODEL ANALYSIS

Debt to EBITDA (DEbitda) Ratio Covenant - McNichols Model - Descriptives - Table 4.2.4.5a

		CovThres	DEbitdaComp	ϬCFO	ϬWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	368	368	368	368	368	368	368	368	368	368	368	368	368	368
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.28	5.15	0.061	0.073	0.522	0.218	658,170	124.046	6.257	0.647	2.516	0.033	202.989	2.935
Median		4	4.381	0.05	0.055	0.594	0.138	467,933	107.254	6.262	0.626	1.926	0	200	3
Std. Deviation		1.516	8.783	0.054	0.06	0.359	0.23	892,488	98.488	1.62	0.293	8.547	0.178	60.012	0.833
Skewness		1.65	-1.334	6.351	1.895	-0.286	0.963	11	5.991	-0.038	1.367	-3.957	5.285	0.494	0.949
Std. Error of Skewness		0.127	0.127	0.127	0.127	0.127	0.127	0	0.127	0.127	0.127	0.127	0.127	0.127	0.127
Kurtosis		7.492	66.433	65.227	4.611	-1.385	-0.096	166	63.528	-0.21	4.758	55.07	26.069	9.631	2.102
Std. Error of Kurtosis		0.254	0.254	0.254	0.254	0.254	0.254	0	0.254	0.254	0.254	0.254	0.254	0.254	0.254
Minimum		0.4	-93.789	0.006	0.008	0	0	5,791	7.639	0.382	0.066	-97.094	0	0	1
Maximum		15	86.57	0.726	0.384	1	0.947	14,675,768	1316.473	10.331	2.412	42.614	1	500	7
Percentiles	25	3.5	2.713	0.032	0.032	0.157	0.012	264,861	72.667	5.104	0.455	0.982	0	200	2
	50	4	4.381	0.05	0.055	0.594	0.138	467,933	107.254	6.262	0.626	1.926	0	200	3
	75	5	6.851	0.071	0.096	0.838	0.367	795,622	157.281	7.405	0.78	3.442	0	200	3

Debt to EBITDA (DEbitda) Ratio Covenant - Tests of Normality - McNichols Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.127	367	0	0.907	367	0
DEbitdaComp	0.278	367	0	0.473	367	0
ϬCFO	0.184	367	0	0.569	367	0
ϬWC	0.138	367	0	0.825	367	0
AQMcNichols	0.142	367	0	0.884	367	0
DEAAQ	0.172	367	0	0.859	367	0
LAmount	0.238	367	0	0.415	367	0
OpCycle	0.13	367	0	0.639	367	0
FirmSize	0.036	367	.200*	0.995	367	0.239
Leverage	0.081	367	0	0.924	367	0

Growth	0.305	367	0	0.523	367	0
Recession	0.54	367	0	0.169	367	0
Interest	0.438	367	0	0.484	367	0
CovNum	0.257	367	0	0.823	367	0

DEbitda - Stage 1 of Two Stage Least Squares - McNichols Model

Dependent Variable	CovThres

	DEbitdaComp	ΔCFO	ΔWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	0.01	-2.097	2.229	0.06	-0.783	0	0	0.025	1.659	0	-0.402	0	0	0
T Values	1.047	-1.352	1.706	0.211	-1.733	-1.154	-0.366	0.431	5.585	0.025	-0.978	3.13	4.356	2.021
Significance	0.296	0.177	0.089	0.833	0.084	0.249	0.715	0.667	0	0.98	0.329	0.002	0	0.044
VIF	1.222	1.362	1.16	1.964	2.06	1.714	1.093	1.633	1.433	1.052	1.026	1.395	1.163	1.138

R-Squared	20.10%
Adjusted R Squared	16.90%
Regression Sig.	0.00%
Breusch-Pagan Test	17.30%

Dependent Variable	Interest

	DEbitdaComp	ΔCFO	ΔWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	1.027	23.017	-43.978	-3.291	23.102	0	0.026	-3.219	-13.833	0.215	14.878	0	0	0
T Values	2.605	0.342	-0.776	-0.268	1.179	0.803	0.779	-1.301	-1.073	0.572	0.834	-1.209	-0.665	0.828
Significance	0.01	0.732	0.438	0.789	0.239	0.423	0.436	0.194	0.284	0.568	0.405	0.228	0.506	0.408
VIF	1.222	1.362	1.16	1.964	2.06	1.714	1.093	1.633	1.433	1.052	1.026	1.395	1.163	1.138

R-Squared	4.10%
Adjusted R Squared	0.03%
Regression Sig.	36.90%

Dependent Variable	CovNum

	DEbitdaComp	ΔCFO	ΔWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	0.007	-0.046	0.009	0.199	-0.273	0	0	-0.172	-0.028	0.001	-0.085	0	0	0
T Values	1.35	-0.052	0.012	1.218	-1.045	0.126	0.074	-5.203	-0.162	0.194	-0.356	-2.422	0.089	-0.044
Significance	0.178	0.959	0.99	0.224	0.297	0.9	0.941	0	0.871	0.846	0.722	0.016	0.929	0.965
VIF	1.222	1.362	1.16	1.964	2.06	1.714	1.093	1.633	1.433	1.052	1.026	1.395	1.163	1.138

R-Squared	11.00%
Adjusted R Squared	7.40%
Regression Sig.	0.00%

Dependent Variable	CR

	DEbitdaComp	ΔCFO	ΔWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.003	0.652	-0.296	0.14	-0.047	0	0.003	-0.068	0.089	-0.032	-0.327	0
T Values	1.173	0.887	-0.4	1.041	-0.227	-1.748	4.288	-2.248	0.541	-2.073	-1.132	0.942
Significance	0.246	0.379	0.691	0.303	0.821	0.087	0	0.029	0.591	0.043	0.263	0.351
VIF	1.244	1.558	1.351	2.16	2.299	3.314	1.386	1.874	2.302	1.249	1.096	1.32

R-Squared	52.00%
Adjusted R Squared	40.70%
Regression Sig.	0.00%

Dependent Variable	ICR

	DEbitdaComp	ΔCFO	ΔWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	-0.01	0	0.844	0.364	-0.44	0	0	0.137	-0.714	0	0.607	0
T Values	-1.376	0	0.981	1.996	-1.478	1.326	0.909	3.451	-3.722	-0.041	2.264	-1.996
Significance	0.17	1	0.327	0.047	0.141	0.186	0.364	0.001	0	0.967	0.024	0.047
VIF	1.273	1.315	1.185	1.901	2.018	1.793	1.082	1.663	1.469	1.051	1.031	1.311

R-Squared	12.50%
Adjusted R Squared	8.70%
Regression Sig.	0.00%

DEbitda - Stage 2 of Two Stage Least Squares - McNichols Model

Table 4.2.4.5b

Dependent Variable	CovThres

	CRhat	ICRhat	Inthat	CovNumhat	DebitdaComp	ΔCFO	ΔWC	AQMcNichols	DEAAQ	LAmount	OpCycle	Leverage	Growth	SIC5
Beta Values	0.184	0.22	-0.076	1.437	0.077	0.172	-1.501	-0.635	1.591	0	0.001	0.693	0.017	0

R-Squared	19.70%
Adjusted R Squared	16.50%

T Values	1.151	2.561	-4.067	2.796	4.042	0.108	-0.954	-1.97	2.148	1.702	1.719	1.867	1.911	3.396
Significance	0.25	0.011	0	0.005	0	0.914	0.341	0.05	0.032	0.09	0.087	0.063	0.057	0.001
VIF	1.418	1.48	10.044	3.822	5.397	1.428	1.674	2.543	5.503	1.629	1.398	2.223	1.163	1.814

Regression Sig.	0.00%
Breusch-Pagan Test	12.10%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DebitdaComp	ϬCFO	ϬWC	AQMcNichols	DEAAQ	LAmount	OpCycle	Leverage	Growth	SIC5
CovThres	1.000	-.085	.159	-.143	-.084	.156	-.051	.052	-.087	-.115	.070	-.043	.341	-.005	.058
CRhat		1.000	-.482	.157	.339	-.128	.219	.092	.108	.080	.054	.042	-.153	-.007	-.006
ICRhat			1.000	-.169	-.388	.086	-.162	-.035	-.004	-.037	-.009	.009	.108	.003	-.032
Inthat				1.000	.486	.510	.273	-.013	.175	.294	.080	.172	-.171	.123	.324
CovNumhat					1.000	-.010	.335	.136	.063	-.144	.227	.013	-.166	-.011	.197
DebitdaComp						1.000	-.083	.064	-.004	.009	-.197	.013	.294	-.040	.022
ϬCFO							1.000	.259	.056	.104	.314	.080	-.001	-.008	.138
ϬWC								1.000	.121	.191	.050	.066	.017	-.082	.013
AQMcNichols									1.000	.692	-.027	-.045	.009	-.004	-.020
DEAAQ										1.000	-.022	-.042	.004	-.049	-.072
LAmount											1.000	-.042	.239	.059	.050
OpCycle												1.000	-.102	.050	-.128
Leverage													1.000	-.102	.022
Growth														1.000	.008
SIC5															1.000

Dependent Variable	**Interest**

Table 4.2.4.5c

	CRhat	ICRhat	DEbitdahat	CovNumhat	DebitdaComp	ϬCFO	ϬWC	AQMcNichols	DEAAQ
Beta Values	-11.396	-6.557	-7.203	17.237	0.912	40.186	-27.288	-3.444	17.998
T Values	-1.665	-1.795	-1.334	1.208	2.374	0.631	-0.482	-0.274	0.849
Significance	0.097	0.073	0.183	0.228	0.018	0.528	0.63	0.784	0.396
VIF	1.417	1.45	1.397	1.603	1.18	1.242	1.181	2.107	2.451

R-Squared	4.50%
Adjusted R-Squared	2.10%
Regression Sig.	5.50%

Dependent Variable	**CovNum**

Table 4.2.4.5d

	CRhat	ICRhat	DEbitdahat	Inthat	DebitdaComp	ϬCFO	ϬWC	AQMcNichols	DEAAQ	OpCycle	FirmSize	Growth	SIC2
Beta Values	0.474	0.074	0.051	0.001	0.006	-0.429	-0.113	0.128	-0.27	0	-0.14	0.001	0
T Values	5.342	1.545	0.584	0.169	0.538	-0.495	-0.14	0.802	-0.877	-0.104	-2.875	0.158	-1.986
Significance	0	0.123	0.56	0.866	0.591	0.621	0.889	0.423	0.381	0.917	0.004	0.875	0.048
VIF	1.422	1.471	2.224	7.223	5.351	1.372	1.42	2.014	3.087	1.224	3.86	1.242	1.686

R-Squared	17.70%
Adjusted R-Squared	14.60%
Regression Sig.	0.00%

Dependent Variable	**CR**

Table 4.2.4.5e

	ICRhat	DEbitdahat	Inthat	CovNumhat	DebitdaComp	ϬCFO	ϬWC	AQMcNichols	OpCycle	Growth	SIC2
Beta Values	0.04	-0.04	-0.005	0.352	0.006	0.214	-0.158	0.106	0.003	-0.019	0
T Values	1.189	-0.435	-0.763	1.64	0.928	0.28	-0.199	1.059	4.814	-1.203	1.475
Significance	0.24	0.665	0.449	0.107	0.358	0.781	0.843	0.294	0	0.235	0.146
VIF	1.257	2.14	8.683	2.637	7.201	1.631	1.511	1.161	1.302	1.229	1.295

R-Squared	49.50%
Adjusted R-Squared	38.80%
Regression Sig.	0.00%

Dependent Variable	**ICR**

Table 4.2.4.5f

	CRhat	DEbitdahat	Inthat	CovNumhat	DebitdaComp	ϬCFO	ϬWC	AQMcNichols	DEAAQ	Leverage	SIC2
Beta Values	-0.328	-0.411	0.008	-0.902	-0.009	-0.077	2.03	0.551	-1.174	0.133	0
T Values	-2.564	-2.956	0.934	-3.215	-0.935	-0.076	2.177	2.874	-3.104	0.495	-2.137
Significance	0.011	0.003	0.351	0.001	0.351	0.939	0.03	0.004	0.002	0.621	0.033
VIF	1.097	4.088	4.32	2.474	2.772	1.402	1.458	2.206	3.409	3.008	1.257

R-Squared	16.10%
Adjusted R-Squared	12.90%
Regression Sig.	0.00%

DEBT TO EBITDA (DEBITDA) RATIO FINANCIAL COVENANT – FRANCIS MODEL ANALYSIS

Debt to EBITDA (DEbitda) Ratio Covenant - Francis Model - Descriptives - Table 4.2.4.6a

		CovThres	DEbitdaComp	ϬCFO	ϬTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	368	368	368	368	368	368	368	368	368	368	368	368	368	368
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.28	5.15	0.061	0.057	0.418	0.038	658,170	124.046	6.257	0.647	2.516	0.033	202.989	2.935
Median		4	4.381	0.05	0.045	0.409	0	467,933	107.254	6.262	0.626	1.926	0	200	3
Std. Deviation		1.516	8.783	0.054	0.04	0.372	0.25	892,488	98.488	1.62	0.293	8.547	0.178	60.012	0.833
Skewness		1.65	-1.334	6.351	1.495	0.143	0.682	11	5.991	-0.038	1.367	-3.957	5.285	0.494	0.949
Std. Error of Skewness		0.127	0.127	0.127	0.127	0.127	0.127	0	0.127	0.127	0.127	0.127	0.127	0.127	0.127
Kurtosis		7.492	66.433	65.227	2.265	-1.582	1.609	166	63.528	-0.21	4.758	55.07	26.069	9.631	2.102
Std. Error of Kurtosis		0.254	0.254	0.254	0.254	0.254	0.254	0	0.254	0.254	0.254	0.254	0.254	0.254	0.254
Minimum		0.4	-93.789	0.006	0.004	0	-0.714	5,791	7.639	0.382	0.066	-97.094	0	0	1
Maximum		15	86.57	0.726	0.23	0.997	0.883	14,675,768	1316.473	10.331	2.412	42.614	1	500	7
Percentiles	25	3.5	2.713	0.032	0.029	0	-0.054	264,861	72.667	5.104	0.455	0.982	0	200	2
	50	4	4.381	0.05	0.045	0.409	0	467,933	107.254	6.262	0.626	1.926	0	200	3
	75	5	6.851	0.071	0.073	0.777	0.086	795,622	157.281	7.405	0.78	3.442	0	200	3

Debt to EBITDA (DEbitda) Ratio Covenant - Tests of Normality - Francis Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.127	367	0	0.907	367	0
DEbitdaComp	0.278	367	0	0.473	367	0
ϬCFO	0.184	367	0	0.569	367	0
ϬTCA	0.154	367	0	0.863	367	0
AQFrancis	0.197	367	0	0.852	367	0
DEAAQ	0.211	367	0	0.896	367	0
LAmount	0.238	367	0	0.415	367	0
OpCycle	0.13	367	0	0.639	367	0
FirmSize	0.036	367	0.2	0.995	367	0.239
Leverage	0.081	367	0	0.924	367	0
Growth	0.305	367	0	0.523	367	0
Recession	0.54	367	0	0.169	367	0
Interest	0.438	367	0	0.484	367	0
CovNum	0.257	367	0	0.823	367	0

DEbitda - Stage 1 of Two Stage Least Squares - Francis Model

Dependent Variable: CovThres

	DEbitdaComp	ϬCFO	ϬTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	0.01	-3.1	4.4	0.139	-0.193	0	0	0.024	1.659	0	-0.403	0	0	0
T Values	1.04	-1.966	2.18	0.698	-0.64	-1.149	-0.182	0.416	5.563	0.033	-0.972	3.21	4.622	2.259
Significance	0.299	0.05	0.03	0.486	0.522	0.251	0.855	0.678	0	0.973	0.332	0.001	0	0.024
VIF	1.234	1.404	1.244	1.048	1.076	1.751	1.095	1.66	1.439	1.05	1.038	1.388	1.146	1.138

R-Squared	19.90%
Adjusted R Squared	16.70%
Regression Sig.	0.00%
Breusch-Pagan Test	31.90%

Dependent Variable: Interest

	DEbitdaComp	ϬCFO	ϬTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	0.944	7.783	87.772	7.287	-2.876	0	0.021	-2.222	-15.268	0.226	19.567	0	0	0
T Values	2.381	0.114	1.003	0.843	-0.22	0.781	0.64	-0.89	-1.182	0.602	1.09	-1.144	-0.61	0.798
Significance	0.018	0.909	0.316	0.4	0.826	0.436	0.522	0.374	0.238	0.547	0.276	0.253	0.543	0.425
VIF	1.234	1.404	1.244	1.048	1.076	1.751	1.095	1.66	1.439	1.05	1.038	1.388	1.146	1.138

R-Squared	4.00%
Adjusted R Squared	0.02%
Regression Sig.	40.20%

Dependent Variable: CovNum

	DEbitdaComp	ϬCFO	ϬTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2	SIC4	SIC5
Beta Values	0.006	-1.098	4.182	0.072	-0.06	0	0	-0.152	-0.062	0.002	-0.017	0	0	0
T Values	1.069	-1.225	3.646	0.636	-0.349	0.203	0.029	-4.637	-0.364	0.347	-0.074	-2.379	0.295	0.183
Significance	0.286	0.221	0	0.526	0.728	0.839	0.977	0	0.716	0.729	0.941	0.018	0.768	0.855

R-Squared	14.00%
Adjusted R Squared	10.50%
Regression Sig.	0.00%

VIF	1.234	1.404	1.244	1.048	1.076	1.751	1.095	1.66	1.439	1.05	1.038	1.388	1.146	1.138

Dependent Variable	CR

	DEbitdaComp	ΘCFO	ΘTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.003	0.767	-0.093	0.013	-0.248	0	0.003	-0.054	0.089	-0.028	-0.29	0
T Values	0.954	1.124	-0.102	0.133	-1.576	-1.341	5.014	-1.842	0.54	-1.788	-1.014	1.129
Significance	0.344	0.266	0.919	0.895	0.121	0.186	0	0.071	0.591	0.08	0.315	0.264
VIF	1.267	1.37	1.302	1.235	1.308	3.216	1.288	1.8	2.362	1.307	1.096	1.355

R-Squared	53.00%
Adjusted R Squared	41.90%
Regression Sig.	0.00%

Dependent Variable	ICR

	DEbitdaComp	ΘCFO	ΘTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	-0.009	0.436	-1.06	0.162	-0.047	0	0	0.12	-0.674	0	0.546	0
T Values	-1.26	0.424	-0.754	1.202	-0.236	1.045	0.85	2.937	-3.47	0.042	2.011	-2.018
Significance	0.209	0.672	0.452	0.231	0.814	0.297	0.396	0.004	0.001	0.966	0.045	0.045
VIF	1.291	1.382	1.305	1.061	1.099	1.847	1.077	1.738	1.491	1.051	1.044	1.286

R-Squared	11.60%
Adjusted R Squared	7.80%
Regression Sig.	0.00%

DEbitda - Stage 2 of Two Stage Least Squares - Francis Model

Table 4.2.4.6b

Dependent Variable	CovThres

	CRhat	ICRhat	Inthat	CovNumhat	DebitdaComp	ΘCFO	ΘTCA	AQFrancis	DEAAQ	LAmount	Leverage	Growth	SIC5
Beta Values	0.193	0.254	-0.059	0.933	0.059	-0.905	5.52	0.495	-0.246	0	0.848	0.016	0
T Values	1.208	2.934	-3.734	1.995	3.633	-0.558	1.995	2.199	-0.814	1.164	2.338	1.72	2.939
Significance	0.228	0.004	0	0.047	0	0.577	0.047	0.029	0.416	0.245	0.02	0.086	0.004
VIF	1.406	1.479	6.724	3.993	3.903	1.464	2.312	1.317	1.068	1.517	2.105	1.136	1.446

R-Squared	18.70%
Adjusted R Squared	15.70%
Regression Sig.	0.00%
Breusch-Pagan Test	19.40%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DebitdaComp	ΘCFO	ΘTCA	AQFrancis	DEAAQ	LAmount	Leverage	Growth	SIC5
CovThres	1.000	-.081	.158	-.063	-.025	.156	-.051	.071	.047	-.003	.070	.341	-.005	.058
CRhat		1.000	-.488	.119	.282	-.128	.219	.125	-.071	.003	.053	-.153	-.007	-.005
ICRhat			1.000	-.147	-.384	.086	-.162	-.196	.063	.019	-.009	.108	.003	-.032
Inthat				1.000	.610	.518	.278	.409	.247	.014	.081	-.174	.125	.329
CovNumhat					1.000	-.009	.297	.691	.029	-.085	.202	-.147	-.010	.175
DebitdaComp						1.000	-.083	.013	.100	.092	-.197	.294	-.040	.022
ΘCFO							1.000	.380	-.035	-.001	.314	-.001	-.008	.138
ΘTCA								1.000	-.009	-.015	.129	.028	-.040	.040
AQFrancis									1.000	.137	.068	.051	-.047	-.049
DEAAQ										1.000	.088	.125	-.069	-.059
LAmount											1.000	.239	.059	.050
Leverage												1.000	-.102	.022
Growth													1.000	.008
SIC5														1.000

Dependent Variable	Interest

Table 4.2.4.6c

	CRhat	ICRhat	DEbitdahat	CovNumhat	DebitdaComp	ΘCFO	ΘTCA	AQFrancis	SIC5
Beta Values	-10.755	-6.93	-8.175	11.523	0.884	23.785	48.988	7.912	0
T Values	-1.577	-1.894	-1.524	0.732	2.325	0.368	0.405	0.93	1.065
Significance	0.116	0.059	0.128	0.465	0.021	0.713	0.686	0.353	0.288
VIF	1.411	1.451	1.366	2.49	1.158	1.279	2.429	1.036	1.126

R-Squared	4.70%
Adjusted R Squared	2.30%
Regression Sig.	4.40%

Dependent Variable	CovNum

Table 4.2.4.6d

	CRhat	ICRhat	DEbitdahat	Inthat	DebitdaComp	ΘCFO	ΘTCA	AQFrancis	DEAAQ	FirmSize	SIC2
Beta Values	0.491	0.088	0.076	0.004	0.001	-1.501	3.68	0.053	-0.079	-0.118	0

R-Squared	21.10%
Adjusted R Squared	18.70%

T Values	5.687	1.899	0.936	0.622	0.115	-1.801	2.751	0.432	-0.492	-3.079	-2.174
Significance	0	0.058	0.35	0.535	0.908	0.073	0.006	0.666	0.623	0.002	0.03
VIF	1.415	1.472	1.952	4.664	3.544	1.336	1.862	1.345	1.049	2.489	1.325

Regression Sig.	0.00%

Table 4.2.4.6e

Dependent Variable	**CR**										
	ICRhat	**DEbitdahat**	**Inthat**	**CovNumhat**	**DebitdaComp**	**ϬCFO**	**ϬTCA**	**AQFrancis**	**DEEAQ**	**OpCycle**	**SIC2**
Beta Values	0.057	-0.029	-0.011	0.521	0.01	0.942	-1.073	0.052	-0.308	0.004	0
T Values	1.818	-0.322	-1.302	1.856	1.303	1.315	-0.906	0.453	-1.995	6.016	1.193
Significance	0.075	0.749	0.199	0.069	0.198	0.194	0.369	0.652	0.051	0	0.238
VIF	1.148	2.115	15.25	6.146	9.229	1.533	2.192	1.664	1.275	1.178	1.331

R-Squared	52.80%
Adjusted R Squared	42.80%
Regression Sig.	0.00%

Table 4.2.4.6f

Dependent Variable	**ICR**										
	CRhat	**DEbitdahat**	**Inthat**	**CovNumhat**	**DebitdaComp**	**ϬCFO**	**ϬTCA**	**AQFrancis**	**DEAAQ**	**Leverage**	**SIC2**
Beta Values	-0.3	-0.377	0.01	-0.869	-0.011	-0.764	2.961	0.189	-0.117	0.11	0
T Values	-2.347	-2.883	1.143	-2.944	-1.134	-0.751	1.555	1.313	-0.592	0.415	-2.097
Significance	0.02	0.004	0.254	0.004	0.258	0.453	0.121	0.19	0.554	0.679	0.037
VIF	1.097	3.6	4.165	3.586	2.629	1.429	2.519	1.271	1.114	2.931	1.284

R-Squared	15.60%
Adjusted R Squared	12.30%
Regression Sig.	0.00%

DEBT TO TANGIBLE NET WORTH (DTNWR) RATIO FINANCIAL COVENANT – JONES MODEL ANALYSIS

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Jones Model - Descriptives - Table 4.2.5.1a

		CovThres	**DTNWComp**	**ϬCFO**	**ϬTA**	**AQJones**	**DTNAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	67	67	67	67	67	67	67	67	67	67	67	67	67	67
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.325	1.771	0.082	0.07	0.152	0.06	637,238	160.72	4.482	0.516	2.078	0	207.09	3.358
Median		1.75	0.936	0.069	0.063	0.04	0.003	366,715	137.113	4.495	0.47	1.516	0	200	3
Std. Deviation		1.977	7.221	0.047	0.041	0.196	0.104	1,761,168	114.105	1.334	0.304	1.954	0	143.667	0.98
Skewness		2.824	2.069	2.102	1.078	1.159	1.993	8	3.262	-0.175	3.804	1.274		0.123	0.71
Std. Error of Skewness		0.293	0.293	0.293	0.293	0.293	0.293	0	0.293	0.293	0.293	0.293	0.293	0.293	0.293
Kurtosis		10.151	26.98	5.878	1.063	0.442	3.181	64	15.252	1.474	22.503	3.115		-0.502	0.253
Std. Error of Kurtosis		0.578	0.578	0.578	0.578	0.578	0.578	1	0.578	0.578	0.578	0.578	0.578	0.578	0.578
Minimum		0.4	-31.713	0.017	0.018	0	0	90,358	28.215	0.382	0.077	-3.536	0	0	2
Maximum		12.1	45.36	0.285	0.188	0.745	0.391	14,675,768	794.915	8.017	2.412	8.549	0	500	6
Percentiles	25	1	0.527	0.053	0.036	0	0	232,910	96.677	3.752	0.345	1.027	0	100	3
	50	1.75	0.936	0.069	0.063	0.04	0.003	366,715	137.113	4.495	0.47	1.516	0	200	3
	75	2.75	1.872	0.1	0.092	0.286	0.082	554,257	196.596	5.136	0.627	2.622	0	300	4

DTNWR Covenant - Tests of Normality - Jones Model - Table 4.2.5.1b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.217	67	0	0.712	67	0
DTNWComp	0.378	67	0	0.392	67	0
ϬCFO	0.175	67	0	0.812	67	0
ϬTA	0.103	67	0.073	0.909	67	0
AQJones	0.244	67	0	0.786	67	0
DTNAAQ	0.281	67	0	0.644	67	0
LAmount	0.378	67	0	0.201	67	0
OpCycle	0.179	67	0	0.713	67	0
FirmSize	0.073	67	.200*	0.973	67	0.147
Leverage	0.142	67	0.002	0.7	67	0
Growth	0.194	67	0	0.818	67	0
Interest	0.227	67	0	0.89	67	0
CovNum	0.284	67	0	0.867	67	0

DTNWR - Stage 1 of Two Stage Least Squares - Jones Model

Dependent Variable	CovThres										
	DTNWComp	ΔCFO	ΔTA	AQJones	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.085	-4.855	4.825	-0.067	1.481	0	0.001	-0.246	5.496	0.083	0
T Values	2.983	-0.716	0.836	-0.041	0.479	-2.851	0.463	-1.373	4.757	0.747	-0.914
Significance	0.004	0.477	0.407	0.968	0.634	0.006	0.645	0.175	0	0.458	0.365
VIF	1.188	2.829	1.561	2.866	2.85	3.916	1.42	1.581	3.421	1.309	1.099

R-Squared	49.30%
Adjusted R-Squared	39.10%
Regression Sig.	0.00%
Breusch-Pagan Test	65.90%

Dependent Variable	Interest										
	DTNWComp	ΔCFO	ΔTA	AQJones	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	1.846	832.884	-373.8	-97.561	237.138	0	0.146	10.3	-88.661	16.337	0
T Values	0.688	1.311	-0.691	-0.635	0.818	0.478	0.788	0.614	-0.819	1.569	0.083
Significance	0.495	0.195	0.492	0.528	0.417	0.634	0.434	0.542	0.416	0.122	0.934
VIF	1.188	2.829	1.561	2.866	2.85	3.916	1.42	1.581	3.421	1.309	1.099

R-Squared	15.70%
Adjusted R-Squared	0.00%
Regression Sig.	51.80%

Dependent Variable	CovNum										
	DTNWComp	ΔCFO	ΔTA	AQJones	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.007	2.531	-1.773	1.675	-2.646	0	-0.001	-0.087	0.048	0.052	0
T Values	0.378	0.57	-0.469	1.559	-1.305	0.055	-0.978	-0.744	0.063	0.712	0.953
Significance	0.707	0.571	0.641	0.125	0.197	0.956	0.332	0.46	0.95	0.479	0.345
VIF	1.188	2.829	1.561	2.866	2.85	3.916	1.42	1.581	3.421	1.309	1.099

R-Squared	11.50%
Adjusted R-Squared	0.00%
Regression Sig.	77.90%

Dependent Variable	CR										
	DTNWComp	ΔCFO	ΔTA	AQJones	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.009	0.272	-3.472	0.181	-1.22	0	0	0.032	-0.135	-0.006	0
T Values	0.716	0.122	-2.034	0.37	-1.14	-0.032	0.025	0.461	-0.335	-0.162	0.038
Significance	0.479	0.904	0.05	0.714	0.262	0.974	0.98	0.647	0.739	0.872	0.97
VIF	1.375	2.943	1.361	2.272	2.193	5.735	1.339	2.171	4.835	1.622	1.276

R-Squared	24.20%
Adjusted R-Squared	0.00%
Regression Sig.	47.60%

Dependent Variable	ICR									
	DTNWComp	ΔCFO	ΔTA	AQJones	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth
Beta Values	0.003	5.492	-6.672	1.659	-3.789	0	-0.003	0.084	-0.234	-0.139
T Values	0.123	0.885	-1.209	0.912	-1.278	-0.036	-1.744	0.514	-0.209	-0.897
Significance	0.903	0.389	0.244	0.375	0.219	0.972	0.1	0.614	0.837	0.383
VIF	1.688	4.605	1.886	6.03	5.619	10.808	1.641	2.726	8.136	1.436

R-Squared	37.50%
Adjusted R-Squared	0.00%
Regression Sig.	50.90%

DTNWR - Stage 2 of Two Stage Least Squares - Jones Model

Table 4.2.5.1c

Dependent Variable	CovThres												
	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ΔCFO	ΔTA	AQJones	DTNAAQ	FirmSize	Leverage	Growth	SIC2
Beta Values	0.03	-0.284	-0.057	-7.472	0.254	62.658	-31.244	7.465	-5.348	-0.274	1.076	1.376	0
T Values	0.094	-1.181	-2.726	-2.781	4.343	2.351	-2.088	1.971	-0.963	-1.158	0.849	2.735	2.18
Significance	0.925	0.243	0.009	0.007	0	0.022	0.042	0.054	0.34	0.252	0.4	0.008	0.034
VIF	1.353	1.528	38.785	21.862	4.885	43.247	10.386	15.116	9.084	2.733	4.077	26.537	4.517

R-Squared	50.60%
Adjusted R-Squared	38.50%
Regression Sig.	0.00%
Breusch-Pagan Test	77.60%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ϬCFO	ϬTA	AQJones	DTNAAQ	FirmSize	Leverage	Growth	SIC2
CovThres	1.000	-.056	.085	-.137	.022	.431	-.022	.148	.086	.164	-.046	.437	-.015	-.064
CRhat		1.000	-.105	-.134	.347	-.110	-.041	-.134	-.058	-.233	-.172	-.038	.122	-.007
ICRhat			1.000	-.081	.222	.215	.067	-.143	.236	.143	.070	.361	-.189	.129
Inthat				1.000	-.135	.231	.389	.081	-.070	.061	.098	-.282	.588	-.191
CovNumhat					1.000	.062	.098	-.105	.278	-.123	-.373	.248	.224	.346
DTNWComp						1.000	-.180	-.022	-.008	.016	.155	.072	.221	-.058
ϬCFO							1.000	.520	-.130	-.053	-.498	.348	-.188	-.116
ϬTA								1.000	-.021	.026	-.279	.128	-.003	-.045
AQJones									1.000	.789	.236	.064	.057	-.050
DTNAAQ										1.000	.197	.128	-.044	-.038
FirmSize											1.000	-.254	.182	-.145
Leverage												1.000	-.287	.000
Growth													1.000	-.128
SIC2														1.000

Table 4.2.5.1d

Dependent Variable	**CovNum**												
	CRhat	**ICRhat**	**DTNWRhat**	**Inthat**	**DTNWComp**	**ϬCFO**	**ϬTA**	**AQJones**	**DTNAAQ**	**OpCycle**	**FirmSize**	**Leverage**	**SIC2**
Beta Values	0.537	0.438	-0.033	0.004	-0.007	-3.691	3.733	0.539	-0.888	-0.001	-0.115	0.026	0
T Values	2.879	3.155	-0.153	0.978	-0.216	-0.706	0.935	0.522	-0.421	-0.753	-1.017	0.033	0.442
Significance	0.006	0.003	0.879	0.333	0.83	0.483	0.354	0.604	0.676	0.455	0.314	0.974	0.66
VIF	1.353	1.528	7.268	3.491	4.064	4.991	2.216	3.367	3.934	2.03	1.875	4.799	1.234

R-Squared	33.00%
Adjusted R Squared	16.50%
Regression Sig.	3.80%

Table 4.2.5.1e

Dependent Variable	**Interest**												
	CRhat	**ICRhat**	**DTNWRhat**	**CovNumhat**	**DTNWComp**	**ϬCFO**	**ϬTA**	**AQJones**	**DTNAAQ**	**Leverage**	**Growth**	**SIC2**	
Beta Values	-5.239	-23.998	-15.312	-117.454	4.76	1221.48	-660.03	152.921	-123.864	27.33	22.131	0	
T Values	-0.175	-1.074	-0.491	-1.009	1.125	1.897	-1.004	0.597	-0.279	0.221	1.905	0.699	
Significance	0.862	0.287	0.626	0.318	0.266	0.063	0.32	0.553	0.781	0.826	0.062	0.487	
VIF	1.345	1.521	5.942	4.737	2.959	2.913	2.314	7.97	6.704	4.489	1.632	2.032	

R-Squared	17.40%
Adjusted R Squared	0.00%
Regression Sig.	50.80%

Table 4.2.5.1f

Dependent Variable	**CR**									
	ICRhat	**DTNWRhat**	**Inthat**	**CovNum**	**DTNWComp**	**ϬCFO**	**ϬTA**	**AQJones**	**DTNAAQ**	**SIC2**
Beta Values	0.128	-0.059	0	-0.039	0.004	-2.246	-2.015	0.051	-1.017	0
T Values	1.644	-0.696	0.241	-0.103	0.272	-0.989	-0.994	0.057	-0.601	-0.226
Significance	0.109	0.491	0.811	0.919	0.788	0.33	0.327	0.955	0.552	0.822
VIF	1.756	2.36	2.918	4.55	2.521	3.353	2.113	8.497	6.028	1.92

R-Squared	29.20%
Adjusted R-Squared	9.00%
Regression Sig.	20.20%

Table 4.2.5.1g

Dependent Variable	**ICR**									
	CRhat	**DTNWRhat**	**Inthat**	**CovNum**	**DTNWComp**	**ϬCFO**	**ϬTA**	**AQJones**	**DTNAAQ**	**OpCycle**
Beta Values	0.241	-0.222	-0.007	0.276	0.04	5.249	-5.928	0.68	-0.141	-0.001
T Values	0.922	-1.063	-0.888	0.32	0.925	0.923	-1.076	0.369	-0.039	-0.458
Significance	0.37	0.304	0.388	0.753	0.369	0.37	0.298	0.717	0.969	0.653
VIF	1.492	5.712	4.422	3.893	6.216	4.075	1.978	6.521	8.637	3.723

R-Squared	40.70%
Adjusted R-Squared	3.60%
Regression Sig.	41.90%

DEBT TO TANGIBLE NET WORTH (DTNWR) RATIO FINANCIAL COVENANT – MODIFIED JONES MODEL ANALYSIS

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Modified Jones Model - Descriptives - Table 4.2.5.2a

		CovThres	**DTNWComp**	**ϬCFO**	**ϬTA**	**AQModJones**	**DTNAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	67	67	67	67	67	67	67	67	67	67	67	67	67	67
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.325	1.771	0.082	0.07	0.139	0.06	637,238	160.72	4.482	0.516	2.078	0	207.09	3.358
Median		1.75	0.936	0.069	0.063	0.025	0.003	366,715	137.113	4.495	0.47	1.516	0	200	3
Std. Deviation		1.977	7.221	0.047	0.041	0.191	0.109	1,761,168	114.105	1.334	0.304	1.954	0	143.667	0.98

Skewness		2.824	2.069	2.102	1.078	1.343	2.218	8	3.262	-0.175	3.804	1.274		0.123	0.71
Std. Error of Skewness		0.293	0.293	0.293	0.293	0.293	0.293	0	0.293	0.293	0.293	0.293	0.293	0.293	0.293
Kurtosis		10.151	26.98	5.878	1.063	0.825	4.202	64	15.252	1.474	22.503	3.115		-0.502	0.253
Std. Error of Kurtosis		0.578	0.578	0.578	0.578	0.578	0.578	1	0.578	0.578	0.578	0.578	0.578	0.578	0.578
Minimum		0.4	-31.713	0.017	0.018	0	0	90,358	28.215	0.382	0.077	-3.536	0	0	2
Maximum		12.1	45.36	0.285	0.188	0.731	0.452	14,675,768	794.915	8.017	2.412	8.549	0	500	6
	25	1	0.527	0.053	0.036	0	0	232,910	96.677	3.752	0.345	1.027	0	100	3
Percentiles	50	1.75	0.936	0.069	0.063	0.025	0.003	366,715	137.113	4.495	0.47	1.516	0	200	3
	75	2.75	1.872	0.1	0.092	0.188	0.063	554,257	196.596	5.136	0.627	2.622	0	300	4

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Tests of Normality - Modified Jones Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.217	67	0	0.712	67	0
DTNWComp	0.378	67	0	0.392	67	0
ƃCFO	0.175	67	0	0.812	67	0
ƃTA	0.103	67	0.073	0.909	67	0
AQModJones	0.236	67	0	0.758	67	0
DTNAAQ	0.293	67	0	0.614	67	0
LAmount	0.378	67	0	0.201	67	0
OpCycle	0.179	67	0	0.713	67	0
FirmSize	0.073	67	.200*	0.973	67	0.147
Leverage	0.142	67	0.002	0.7	67	0
Growth	0.194	67	0	0.818	67	0
Interest	0.227	67	0	0.89	67	0
CovNum	0.284	67	0	0.867	67	0

DTNWR - Stage 1 of Two Stage Least Squares - Modified Jones Model

Dependent Variable	CovThres										
	DTNWComp	ƃCFO	ƃTA	AQModJones	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.084	-5.009	5.316	-0.591	0.539	0	0.001	-0.213	5.657	0.087	0
T Values	2.911	-0.734	0.913	-0.302	0.16	-2.905	0.406	-1.2	4.901	0.773	-0.917
Significance	0.005	0.466	0.365	0.764	0.874	0.005	0.686	0.235	0	0.443	0.363
VIF	1.189	2.846	1.579	3.841	3.765	3.899	1.415	1.541	3.39	1.32	1.099

R-Squared	48.90%
Adjusted R Squared	38.70%
Regression Sig.	0.00%
Breusch-Pagan Test	80.40%

Dependent Variable	Interest										
	DTNWComp	ƃCFO	ƃTA	AQModJones	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	1.759	798.503	-308.898	-179.185	306.366	0	0.143	11.518	-82.976	16.875	0
T Values	0.657	1.258	-0.57	-0.983	0.975	0.483	0.772	0.698	-0.773	1.62	0.111
Significance	0.514	0.214	0.571	0.33	0.334	0.631	0.444	0.488	0.443	0.111	0.912
VIF	1.189	2.846	1.579	3.841	3.765	3.899	1.415	1.541	3.39	1.32	1.099

R-Squared	16.20%
Adjusted R Squared	0.00%
Regression Sig.	48.40%

Dependent Variable	CovNum										
	DTNWComp	ƃCFO	ƃTA	AQModJones	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.007	2.704	-2.217	1.939	-3.088	0	-0.001	-0.082	0.009	0.049	0
T Values	0.368	0.607	-0.583	1.515	-1.399	0.081	-1.021	-0.705	0.011	0.671	0.896
Significance	0.714	0.547	0.562	0.135	0.167	0.936	0.312	0.484	0.991	0.505	0.374
VIF	1.189	2.846	1.579	3.841	3.765	3.899	1.415	1.541	3.39	1.32	1.099

R-Squared	11.30%
Adjusted R Squared	0.00%
Regression Sig.	78.80%

Dependent Variable	CR										
	DTNWComp	ƃCFO	ƃTA	AQModJones	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.009	0.278	-3.582	0.423	-1.553	0	0	0.031	-0.144	-0.008	0
T Values	0.72	0.126	-2.12	0.734	-1.443	-0.039	0.057	0.45	-0.366	-0.209	-0.056

R-Squared	26.10%
Adjusted R Squared	2.20%
Regression Sig.	39.80%

Significance	0.477	0.9	0.041	0.468	0.158	0.969	0.955	0.656	0.717	0.835	0.956
VIF	1.364	2.932	1.366	3.083	2.991	5.571	1.329	2.13	4.698	1.624	1.272

Dependent Variable	ICR									
	DTNWComp	**ΔCFO**	**ΔTA**	**AQModJones**	**DTNAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**
Beta Values	0.004	5.952	-7	1.293	-2.833	0	-0.004	0.086	-0.437	-0.122
T Values	0.161	0.93	-1.201	0.581	-0.781	0.065	-1.942	0.525	-0.382	-0.747
Significance	0.874	0.366	0.247	0.57	0.446	0.949	0.07	0.606	0.707	0.466
VIF	1.664	4.6	1.973	8.214	8.089	10.925	1.555	2.577	7.986	1.505

R-Squared	33.50%
Adjusted R-Squared	0.00%
Regression Sig.	62.70%

DTNWR - Stage 2 of Two Stage Least Squares - Modified Jones Model

Table 4.2.5.2b

Dependent Variable	CovThres											
	CRhat	**ICRhat**	**Inthat**	**CovNumhat**	**DTNWComp**	**ΔCFO**	**ΔTA**	**AQModJones**	**DTNAAQ**	**LAmount**	**Leverage**	**SIC2**
Beta Values	0.003	-0.27	0.002	0.465	0.089	-3.351	6.063	-0.841	0.996	0	5.742	0
T Values	0.01	-1.11	0.273	0.389	2.443	-0.436	0.91	-0.265	0.192	-2.589	4.144	-0.598
Significance	0.992	0.272	0.786	0.699	0.018	0.664	0.367	0.792	0.849	0.012	0	0.552
VIF	1.351	1.507	2.735	4.187	1.862	3.528	2.023	9.862	8.687	4.569	4.784	1.751

R-Squared	48.80%
Adjusted R-Squared	37.40%
Regression Sig.	0.00%
Breusch-Pagan Test	93.10%

Pearson Correlations

	CovThres	**CRhat**	**ICRhat**	**Inthat**	**CovNumhat**	**DTNWComp**	**ΔCFO**	**ΔTA**	**AQModJones**	**DTNAAQ**	**LAmount**	**Leverage**	**SIC2**
CovThres	1.000	-.050	.085	-.132	.024	.431	-.022	.148	.029	.040	-.046	-.015	-.064
CRhat		1.000	-.113	-.042	.278	-.111	-.041	-.135	.002	.034	-.173	.123	-.007
ICRhat			1.000	-.110	.175	.215	.068	-.144	.219	-.239	.069	-.190	.155
Inthat				1.000	-.070	.213	.359	.075	-.153	.457	.091	.542	-.176
CovNumhat					1.000	.074	.116	-.124	.265	-.154	-.441	.265	.410
DTNWComp						1.000	-.180	-.022	-.003	-.012	.155	.221	-.058
ΔCFO							1.000	.520	-.126	-.080	-.498	-.188	-.116
ΔTA								1.000	-.001	.113	-.279	-.003	-.045
AQModJones									1.000	-.213	.182	.081	-.023
DTNAAQ										1.000	-.030	.178	-.002
LAmount											1.000	.182	-.145
Leverage												1.000	-.128
SIC2													1.000

Table 4.2.5.2c

Dependent Variable	CovNum											
	CRhat	**ICRhat**	**DTNWRhat**	**Inthat**	**DTNWComp**	**ΔCFO**	**ΔTA**	**AQModJones**	**DTNAAQ**	**OpCycle**	**Leverage**	**SIC2**
Beta Values	0.576	0.429	-0.009	0.002	-0.006	-1.103	3.164	0.542	-1.27	-0.001	-0.075	0
T Values	3.175	3.136	-0.044	0.7	-0.218	-0.246	0.79	0.421	-0.57	-0.711	-0.095	0.597
Significance	0.002	0.003	0.965	0.487	0.828	0.806	0.433	0.675	0.571	0.48	0.925	0.553
VIF	1.299	1.475	6.824	3.033	3.835	3.699	2.252	5.004	4.948	1.945	4.857	1.159

R-Squared	32.40%
Adjusted R-Squared	17.40%
Regression Sig.	2.80%

Table 4.2.5.2d

Dependent Variable	Interest										
	CRhat	**ICRhat**	**DTNWRhat**	**CovNumhat**	**DTNWComp**	**ΔCFO**	**ΔTA**	**AQModJones**	**DTNAAQ**	**Leverage**	**SIC2**
Beta Values	-7.806	-27.137	-15.515	-20.262	5.477	891.78	-384.964	-32.748	118.477	-26.407	0
T Values	-0.255	-1.186	-0.485	-0.191	1.264	1.365	-0.561	-0.112	0.248	-0.209	0.002
Significance	0.799	0.241	0.63	0.849	0.212	0.178	0.577	0.911	0.805	0.835	0.998
VIF	1.343	1.503	5.934	3.699	2.964	2.867	2.41	9.443	8.275	4.448	1.659

R-Squared	12.00%
Adjusted R-Squared	0.00%
Regression Sig.	75.00%

Table 4.2.5.2e

Dependent Variable	CR									
	ICRhat	**DTNWRhat**	**Inthat**	**CovNum**	**DTNWComp**	**ΔCFO**	**ΔTA**	**AQModJones**	**DTNAAQ**	**LAmount**
Beta Values	0.117	-0.044	0.001	-0.092	0.004	-1.384	-2.521	0.46	-1.675	0

R-Squared	30.90%
Adjusted R-Squared	11.10%

T Values	1.585	-0.584	0.339	-0.282	0.271	-0.589	-1.26	0.492	-1.049	-0.399
Significance	0.122	0.563	0.736	0.78	0.788	0.559	0.216	0.626	0.301	0.692
VIF	1.601	1.95	2.451	3.307	2.397	3.663	2.109	8.92	7.245	2.229

Regression Sig.	15.90%

Table 4.2.5.2f

Dependent Variable	**ICR**								
	CRhat	**DTNWRhat**	**Inthat**	**CovNum**	**DTNWComp**	**ΘCFO**	**ΘTA**	**AQModJones**	**DTNAAQ**
Beta Values	0.277	-0.16	-0.008	0.576	0.028	3.404	-5.593	-1.099	2.202
T Values	1.021	-0.804	-1.054	0.812	0.658	0.573	-0.946	-0.447	0.535
Significance	0.321	0.432	0.306	0.428	0.519	0.574	0.357	0.66	0.6
VIF	1.514	4.953	3.054	2.501	5.399	4.111	2.113	10.401	10.83

R-Squared	32.00%
Adjusted R-Squared	0.00%
Regression Sig.	55.30%

DEBT TO TANGIBLE NET WORTH (DTNWR) RATIO FINANCIAL COVENANT – PEASNELL MODEL ANALYSIS

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Peasnell Model - Descriptives - Table 4.2.5.3a

		CovThres	**DTNWComp**	**ΘCFO**	**ΘWCA**	**AQPeasnell**	**DTNAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	67	67	67	67	67	67	67	67	67	67	67	67	67	67
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.325	1.771	0.082	0.095	0.269	0.092	637,238	160.72	4.482	0.516	2.078	0	207.09	3.358
Median		1.75	0.936	0.069	0.071	0.133	0.028	366,715	137.113	4.495	0.47	1.516	0	200	3
Std. Deviation		1.977	7.221	0.047	0.083	0.294	0.133	1,761,168	114.105	1.334	0.304	1.954	0	143.667	0.98
Skewness		2.824	2.069	2.102	2.734	0.73	1.915	8	3.262	-0.175	3.804	1.274		0.123	0.71
Std. Error of Skewness		0.293	0.293	0.293	0.293	0.293	0.293	0	0.293	0.293	0.293	0.293	0.293	0.293	0.293
Kurtosis		10.151	26.98	5.878	8.496	-0.826	3.835	64	15.252	1.474	22.503	3.115		-0.502	0.253
Std. Error of Kurtosis		0.578	0.578	0.578	0.578	0.578	0.578	1	0.578	0.578	0.578	0.578	0.578	0.578	0.578
Minimum		0.4	-31.713	0.017	0.016	0	0	90,358	28.215	0.382	0.077	-3.536	0	0	2
Maximum		12.1	45.36	0.285	0.457	0.942	0.624	14,675,768	794.915	8.017	2.412	8.549	0	500	6
Percentiles	25	1	0.527	0.053	0.05	0	0	232,910	96.677	3.752	0.345	1.027	0	100	3
	50	1.75	0.936	0.069	0.071	0.133	0.028	366,715	137.113	4.495	0.47	1.516	0	200	3
	75	2.75	1.872	0.1	0.109	0.529	0.153	554,257	196.596	5.136	0.627	2.622	0	300	4

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Tests of Normality - Peasnell Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.217	67	0	0.712	67	0
DTNWComp	0.378	67	0	0.392	67	0
ΘCFO	0.175	67	0	0.812	67	0
ΘWCA	0.212	67	0	0.694	67	0
AQPeasnell	0.186	67	0	0.837	67	0
DTNAAQ	0.246	67	0	0.73	67	0
LAmount	0.378	67	0	0.201	67	0
OpCycle	0.179	67	0	0.713	67	0
FirmSize	0.073	67	.200*	0.973	67	0.147
Leverage	0.142	67	0.002	0.7	67	0
Growth	0.194	67	0	0.818	67	0
Interest	0.227	67	0	0.89	67	0
CovNum	0.284	67	0	0.867	67	0

DTNWR - Stage 1 of Two Stage Least Squares - Peasnell Model

Dependent Variable	CovThres

	DTNWComp	ΘCFO	ΘWCA	AQPeasnell	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.102	-3.226	1.618	1.433	-1.719	0	0.001	-0.223	5.449	0.054	0
T Values	3.386	-0.535	0.582	1.231	-0.767	-2.998	0.314	-1.277	4.821	0.49	-1.195
Significance	0.001	0.595	0.563	0.223	0.446	0.004	0.755	0.207	0	0.626	0.237
VIF	1.379	2.332	1.548	3.369	2.572	3.649	1.488	1.566	3.407	1.338	1.123

R-Squared	51.20%
Adjusted R-Squared	41.50%
Regression Sig.	0.00%
Breusch-Pagan Test	86.90%

Dependent Variable	Interest

	DTNWComp	ΘCFO	ΘWCA	AQPeasnell	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	2.574	795.333	-156.484	66.287	85.488	0	0.083	14.338	-104.234	13.187	0
T Values	0.896	1.389	-0.593	0.6	0.402	0.662	0.441	0.865	-0.972	1.261	0.035
Significance	0.374	0.171	0.556	0.551	0.689	0.511	0.661	0.391	0.335	0.213	0.973
VIF	1.379	2.332	1.548	3.369	2.572	3.649	1.488	1.566	3.407	1.338	1.123

R-Squared	16.80%
Adjusted R-Squared	0.02%
Regression Sig.	44.80%

Dependent Variable	CovNum

	DTNWComp	ΘCFO	ΘWCA	AQPeasnell	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.001	1.973	0.441	-0.582	2.393	0	-0.002	-0.027	0.027	0.069	0
T Values	0.029	0.491	0.238	-0.751	1.606	0.247	-1.463	-0.237	0.037	0.943	0.942
Significance	0.977	0.625	0.813	0.456	0.114	0.806	0.149	0.814	0.971	0.35	0.35
VIF	1.379	2.332	1.548	3.369	2.572	3.649	1.488	1.566	3.407	1.338	1.123

R-Squared	12.10%
Adjusted R-Squared	0.00%
Regression Sig.	74.10%

Dependent Variable	CR

	DTNWComp	ΘCFO	ΘWCA	AQPeasnell	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.001	0.14	-1.984	-0.046	0.665	0	0	0.043	-0.409	0.007	0
T Values	0.056	0.066	-1.963	-0.095	0.789	0.581	0.408	0.644	-1.031	0.17	0.872
Significance	0.956	0.948	0.058	0.925	0.436	0.565	0.686	0.524	0.31	0.866	0.389
VIF	1.938	2.795	2.506	5.553	3.39	5.436	1.381	2.072	4.988	1.82	1.457

R-Squared	29.00%
Adjusted R-Squared	6.00%
Regression Sig.	28.90%

Dependent Variable	ICR

	DTNWComp	ΘCFO	ΘWCA	AQPeasnell	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth
Beta Values	0.003	2.902	-2.213	0.407	-1.252	0	-0.004	0.049	-1.123	-0.081
T Values	0.117	0.473	-0.767	0.366	-0.617	0.673	-1.839	0.286	-1.084	-0.481
Significance	0.908	0.643	0.454	0.719	0.546	0.51	0.085	0.779	0.295	0.637
VIF	1.649	4.118	1.927	3.768	3.839	8.401	1.544	2.716	6.408	1.544

R-Squared	31.80%
Adjusted R-Squared	0.00%
Regression Sig.	67.60%

DTNWR - Stage 2 of Two Stage Least Squares - Peasnell Model

Table 4.2.5.3b

Dependent Variable	CovThres

	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ΘCFO	ΘWCA	AQPeasnell	DTNAAQ	OpCycle	FirmSize	SIC2
Beta Values	0.102	-0.322	-0.044	7.623	0.23	13.536	-8.707	8.974	-16.355	0.02	0.731	0
T Values	0.335	-1.42	-4.857	3.274	6.743	2.013	-2.558	4.655	-3.234	3.223	2.688	-3.244
Significance	0.739	0.161	0	0.002	0	0.049	0.013	0	0.002	0.002	0.01	0.002
VIF	1.233	1.348	7.912	17.677	1.7	2.803	2.243	8.947	12.7	13.646	3.675	3.122

R-Squared	50.60%
Adjusted R Squared	39.60%
Regression Sig.	0.00%
Breusch-Pagan Test	82.80%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ΘCFO	ΘWCA	AQPeasnell	DTNAAQ	OpCycle	FirmSize	SIC2

CovThres	1.000	-.054	.069	-.101	.029	.431	-.022	.071	.081	.010	-.080	-.046	-.064
CRhat		1.000	-.131	-.082	.279	-.110	-.041	-.088	-.066	.028	-.275	-.171	-.007
ICRhat			1.000	-.056	.131	.215	.070	-.136	-.105	.004	-.061	.067	.161
Inthat				1.000	.121	.223	.376	.083	.345	.397	.521	.095	-.184
CovNumhat					1.000	.061	.096	.130	.189	.482	-.448	-.363	.337
DTNWComp						1.000	-.180	-.123	-.233	-.045	.004	.155	-.058
ϬCFO							1.000	.224	.062	.012	.332	-.498	-.116
ϬWCA								1.000	.508	.260	.149	-.215	.120
AQPeasnell									1.000	.728	.193	-.106	.123
DTNAAQ										1.000	.234	-.145	.072
OpCycle											1.000	-.060	-.050
FirmSize												1.000	-.145
SIC2													1.000

Dependent Variable **CovNum**

Table 4.2.5.3c

	CRhat	**ICRhat**	**DTNWRhat**	**Inthat**	**DTNWComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**DTNAAQ**	**OpCycle**	**FirmSize**	**Leverage**	**SIC2**
Beta Values	0.533	0.395	0.03	0.004	-0.015	-2.555	1.714	-0.447	0.91	-0.001	-0.088	-0.006	0
T Values	2.979	2.94	0.128	0.929	-0.358	-0.523	0.966	-0.449	0.637	-0.927	-0.737	-0.007	0.392
Significance	0.004	0.005	0.899	0.357	0.721	0.603	0.338	0.655	0.527	0.358	0.464	0.994	0.697
VIF	1.258	1.392	8.855	5.843	7.587	4.349	1.793	7.024	2.976	1.917	2.084	4.571	1.42

R-Squared	32.90%
Adjusted R-Squared	16.40%
Regression Sig.	3.90%

Dependent Variable **Interest**

Table 4.2.5.3d

	CRhat	**ICRhat**	**DTNWRhat**	**CovNumhat**	**DTNWComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**DTNAAQ**	**OpCycle**	**FirmSize**	**Leverage**	**SIC2**
Beta Values	-3.061	-26.832	-14.12	178.536	4.568	453.005	-237.439	176.212	-325.509	0.434	20.7	-10.878	0
T Values	-0.106	-1.242	-0.415	1.236	0.87	0.693	-0.842	1.323	-0.877	1.288	1.133	-0.082	-0.788
Significance	0.916	0.22	0.68	0.222	0.388	0.492	0.403	0.192	0.384	0.203	0.262	0.935	0.434
VIF	1.258	1.392	7.361	7.731	4.564	3.017	1.75	4.858	7.772	4.686	1.887	5.139	1.851

R-Squared	19.20%
Adjusted R-Squared	0.00%
Regression Sig.	49.30%

Dependent Variable **CR**

Table 4.2.5.3e

	ICRhat	**DTNWRhat**	**Inthat**	**CovNum**	**DTNWComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**DTNAAQ**	**LAmount**
Beta Values	0.114	-0.084	0.001	-0.015	0.003	-1.756	-1.381	0.058	0.457	0
T Values	1.591	-0.916	0.329	-0.057	0.125	-0.819	-1.385	0.094	0.481	-0.339
Significance	0.121	0.366	0.744	0.955	0.902	0.418	0.175	0.926	0.633	0.737
VIF	1.449	2.941	3.779	2.333	5.085	3.132	2.645	10.054	4.662	2.406

R-Squared	32.50%
Adjusted R-Squared	13.20%
Regression Sig.	12.30%

Dependent Variable **ICR**

Table 4.2.5.3f

	CRhat	**DTNWRhat**	**Inthat**	**CovNum**	**DTNWComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**DTNAAQ**	**LAmount**
Beta Values	0.473	-0.304	-0.008	0.277	0.056	-0.114	-1.56	1.936	-3.311	0
T Values	1.595	-1.386	-0.907	0.374	1.1	-0.016	-0.533	1.562	-1.645	0.641
Significance	0.13	0.185	0.378	0.714	0.287	0.987	0.601	0.138	0.119	0.531
VIF	2.112	6.774	5.623	3.55	8.924	6.336	2.407	5.697	4.586	5.416

R-Squared	43.70%
Adjusted R-Squared	8.60%
Regression Sig.	33.60%

DEBT TO TANGIBLE NET WORTH (DTNWR) RATIO FINANCIAL COVENANT – DECHOW AND DICHEV (DD) MODEL ANALYSIS

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Dechow and Dichev (DD) Model - Descriptives - Table 4.2.5.4a

		CovThres	**DTNWComp**	**ϬCFO**	**ϬWC**	**AQDD**	**DTNAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	67	67	67	67	67	67	67	67	67	67	67	67	67	67
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.325	1.771	0.082	0.08	0.27	0.094	637,238	160.72	4.482	0.516	2.078	0	207.09	3.358
Median		1.75	0.936	0.069	0.066	0.167	0.03	366,715	137.113	4.495	0.47	1.516	0	200	3
Std. Deviation		1.977	7.221	0.047	0.062	0.296	0.135	1,761,168	114.105	1.334	0.304	1.954	0	143.667	0.98
Skewness		2.824	2.069	2.102	2.449	0.76	1.682	8	3.262	-0.175	3.804	1.274		0.123	0.71
Std. Error of Skewness		0.293	0.293	0.293	0.293	0.293	0.293	0	0.293	0.293	0.293	0.293	0.293	0.293	0.293
Kurtosis		10.151	26.98	5.878	7.617	-0.754	2.273	64	15.252	1.474	22.503	3.115		-0.502	0.253
Std. Error of Kurtosis		0.578	0.578	0.578	0.578	0.578	0.578	1	0.578	0.578	0.578	0.578	0.578	0.578	0.578
Minimum		0.4	-31.713	0.017	0.012	0	0	90,358	28.215	0.382	0.077	-3.536	0	0	2

Maximum		12.1	45.36	0.285	0.349	0.984	0.557	14,675,768	794.915	8.017	2.412	8.549	0	500	6
	25	1	0.527	0.053	0.042	0	0	232,910	96.677	3.752	0.345	1.027	0	100	3
Percentiles	50	1.75	0.936	0.069	0.066	0.167	0.03	366,715	137.113	4.495	0.47	1.516	0	200	3
	75	2.75	1.872	0.1	0.1	0.521	0.131	554,257	196.596	5.136	0.627	2.622	0	300	4

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Tests of Normality - DD Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.217	67	0	0.712	67	0
DTNWComp	0.378	67	0	0.392	67	0
ΔCFO	0.175	67	0	0.812	67	0
ΔWC	0.155	67	0	0.764	67	0
AQDD	0.188	67	0	0.841	67	0
DTNAAQ	0.243	67	0	0.735	67	0
LAmount	0.378	67	0	0.201	67	0
OpCycle	0.179	67	0	0.713	67	0
FirmSize	0.073	67	.200*	0.973	67	0.147
Leverage	0.142	67	0.002	0.7	67	0
Growth	0.194	67	0	0.818	67	0
Interest	0.227	67	0	0.89	67	0
CovNum	0.284	67	0	0.867	67	0

DTNWR - Stage 1 of Two Stage Least Squares - DD Model

Dependent Variable: CovThres

	DTNWComp	ΔCFO	ΔWC	AQDD	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.081	-5.263	4.649	-0.153	3.646	0	0	-0.162	5.328	0.095	0
T Values	2.922	-0.862	1.438	-0.147	1.702	-2.713	-0.083	-0.933	4.783	0.904	-0.591
Significance	0.005	0.392	0.156	0.884	0.094	0.009	0.934	0.355	0	0.37	0.557
VIF	1.237	2.534	1.24	2.936	2.56	3.793	1.505	1.635	3.516	1.286	1.161

R-Squared	54.10%
Adjusted R-Squared	44.90%
Regression Sig.	0.00%
Breusch-Pagan Test	25.70%

Dependent Variable: Interest

	DTNWComp	ΔCFO	ΔWC	AQDD	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	1.488	966.031	-376.106	-163.782	536.962	0	0.095	25.771	-72.836	11.15	0
T Values	0.58	1.715	-1.261	-1.696	2.717	0.621	0.528	1.613	-0.709	1.153	-0.132
Significance	0.565	0.092	0.213	0.096	0.009	0.537	0.6	0.112	0.482	0.254	0.895
VIF	1.237	2.534	1.24	2.936	2.56	3.793	1.505	1.635	3.516	1.286	1.161

R-Squared	26.00%
Adjusted R-Squared	11.20%
Regression Sig.	8.50%

Dependent Variable: CovNum

	DTNWComp	ΔCFO	ΔWC	AQDD	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.003	0.371	1.167	-0.183	1.196	0	-0.002	-0.042	-0.238	0.056	0
T Values	0.174	0.087	0.517	-0.251	0.8	0.628	-1.309	-0.351	-0.306	0.76	0.987
Significance	0.862	0.931	0.607	0.803	0.427	0.533	0.196	0.727	0.761	0.451	0.328
VIF	1.237	2.534	1.24	2.936	2.56	3.793	1.505	1.635	3.516	1.286	1.161

R-Squared	9.20%
Adjusted R-Squared	0.00%
Regression Sig.	89.20%

Dependent Variable: CR

	DTNWComp	ΔCFO	ΔWC	AQDD	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.004	-2.021	0.211	-0.034	0.154	0	0	0.047	-0.359	-0.013	0
T Values	0.265	-0.792	0.174	-0.086	0.184	0.719	0.171	0.6	-0.798	-0.319	0.069
Significance	0.793	0.434	0.863	0.932	0.855	0.477	0.865	0.552	0.431	0.752	0.945
VIF	1.634	3.29	1.511	3.464	3.121	5.938	1.509	2.336	5.151	1.658	1.307

R-Squared	11.70%
Adjusted R-Squared	0.00%
Regression Sig.	94.30%

Dependent Variable: ICR

	DTNWComp	ΘCFO	ΘWC	AQDD	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth
Beta Values	0.006	4.271	-1.214	-0.566	-0.152	0	-0.003	0.146	-0.829	-0.073
T Values	0.213	0.548	-0.325	-0.512	-0.071	0.682	-1.119	0.651	-0.728	-0.467
Significance	0.834	0.591	0.749	0.616	0.944	0.505	0.28	0.524	0.477	0.647
VIF	1.985	6.436	2.571	4.316	4.009	8.364	2.148	4.571	7.501	1.3

R-Squared	29.60%
Adjusted R-Squared	0.00%
Regression Sig.	73.40%

DTNWR - Stage 2 of Two Stage Least Squares - DD Model

Dependent Variable	CovThres

Table 4.2.5.4b

	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ΘCFO	ΘWC	AQDD	OpCycle	FirmSize	Leverage	SIC2
Beta Values	-0.006	-0.407	0.022	-5.879	0.088	-26.618	20.67	1.79	-0.012	-0.842	4.821	0
T Values	-0.02	-1.822	2.763	-2.421	2.994	-3.438	3.514	2.347	-2.291	-2.6	4.849	2.137
Significance	0.984	0.074	0.008	0.019	0.004	0.001	0.001	0.023	0.026	0.012	0	0.037
VIF	1.267	1.396	10.402	15.463	1.348	3.964	3.991	1.516	11.492	5.567	2.722	4.038

R-Squared	53.60%
Adjusted R-Squared	43.30%
Regression Sig.	0.00%
Breusch-Pagan Test	12.50%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ΘCFO	ΘWC	AQDD	OpCycle	FirmSize	Leverage	SIC2
CovThres	1.000	-.033	.069	-.024	.154	.431	-.022	.172	.218	-.080	-.046	.437	-.064
CRhat		1.000	-.190	-.155	.269	-.112	-.042	.047	.014	-.281	-.175	-.038	-.007
ICRhat			1.000	-.044	.088	.217	.068	.069	-.106	-.061	.070	.364	.165
Inthat				1.000	.136	.179	.302	-.118	.146	.420	.076	-.219	-.148
CovNumhat					1.000	.070	.110	.044	-.030	-.516	-.418	.277	.388
DTNWComp						1.000	-.180	.069	-.120	.004	.155	.072	-.058
ΘCFO							1.000	.286	.334	.332	-.498	.348	-.116
ΘWC								1.000	.027	.204	-.042	.004	-.139
AQDD									1.000	.245	-.116	.265	-.176
OpCycle										1.000	-.060	-.241	-.050
FirmSize											1.000	-.254	-.145
Leverage												1.000	.000
SIC2													1.000

Dependent Variable	CovNum

Table 4.2.5.4c

	CRhat	ICRhat	DTNWRhat	Inthat	DTNWComp	ΘCFO	ΘWC	AQDD	DTNAAQ	OpCycle	SIC2
Beta Values	0.655	0.396	-0.047	0.001	0.002	0.301	0.114	-0.148	1.056	-0.001	0
T Values	3.742	3.158	-0.331	0.394	0.071	0.094	0.052	-0.195	0.488	-0.583	0.521
Significance	0	0.003	0.742	0.695	0.944	0.925	0.959	0.846	0.627	0.562	0.604
VIF	1.181	1.245	3.535	4.532	2.814	1.915	1.6	4.235	7.176	1.686	1.273

R-Squared	32.10%
Adjusted R-Squared	18.50%
Regression Sig.	1.80%

Dependent Variable	Interest

Table 4.2.5.4d

	CRhat	ICRhat	DTNWRhat	CovNumhat	DTNWComp	ΘCFO	ΘWC	AQDD	DTNAAQ	FirmSize	OpCycle	Growth
Beta Values	3.689	-26.811	-4.095	50.584	2.429	1118.518	-421.26	-176.084	504.915	32.701	0.183	6.806
T Values	0.133	-1.315	-0.205	0.414	0.711	2.184	-1.274	-1.769	2.021	1.649	0.609	0.576
Significance	0.895	0.194	0.839	0.681	0.48	0.033	0.208	0.083	0.048	0.105	0.545	0.567
VIF	1.282	1.423	3.085	4.79	2.219	2.12	1.541	3.155	4.138	2.549	4.277	1.946

R-Squared	28.20%
Adjusted R-Squared	12.20%
Regression Sig.	7.80%

Dependent Variable	CR

Table 4.2.5.4e

	ICRhat	DTNWRhat	Inthat	CovNum	DTNWComp	ΘCFO	ΘWC	AQDD	DTNAAQ	OpCycle	SIC2
Beta Values	0.185	-0.115	0	0.197	0.003	-4.714	0.934	0.218	0.201	0	0
T Values	2.185	-1.319	-0.051	0.406	0.183	-2.086	0.688	0.485	0.15	0.172	-0.639
Significance	0.036	0.196	0.96	0.687	0.856	0.045	0.496	0.631	0.882	0.865	0.527
VIF	1.696	2.68	6.157	4.754	2.726	2.924	2.155	5	8.997	3.064	2.101

R-Squared	22.00%
Adjusted R-Squared	0.00%
Regression Sig.	57.40%

Dependent Variable	ICR

Table 4.2.5.4f

	CRhat	DTNWRhat	Inthat	CovNum	DTNWComp	ƃCFO	ƃWC	AQDD	OpCycle	FirmSize	Growth
Beta Values	0.47	-0.138	-0.002	1.44	0.029	5.744	-4.631	-0.538	0.002	0.402	-0.19
T Values	1.969	-0.802	-0.574	1.528	0.918	1.059	-1.274	-0.746	0.514	1.775	-1.306
Significance	0.068	0.435	0.575	0.147	0.373	0.306	0.222	0.467	0.615	0.096	0.211
VIF	1.287	4.201	1.961	4.25	3.714	4.135	3.232	2.423	5.471	6.172	1.486

R-Squared	50.20%
Adjusted R-Squared	13.70%
Regression Sig.	27.80%

DEBT TO TANGIBLE NET WORTH (DTNWR) RATIO FINANCIAL COVENANT – MCNICHOLS MODEL ANALYSIS

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - McNichols Model - Descriptives - Table 4.2.5.5a

		CovThres	DTNWComp	ƃCFO	ƃWC	AQMcNichols	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	67	67	67	67	67	67	67	67	67	67	67	67	67	67
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.325	1.771	0.082	0.08	0.537	0.207	637,238	160.72	4.482	0.516	2.078	0	207.09	3.358
Median		1.75	0.936	0.069	0.066	0.579	0.132	366,715	137.113	4.495	0.47	1.516	0	200	3
Std. Deviation		1.977	7.221	0.047	0.062	0.36	0.221	1,761,168	114.105	1.334	0.304	1.954	0	143.667	0.98
Skewness		2.824	2.069	2.102	2.449	-0.376	1.123	8	3.262	-0.175	3.804	1.274		0.123	0.71
Std. Error of Skewness		0.293	0.293	0.293	0.293	0.293	0.293	0	0.293	0.293	0.293	0.293	0.293	0.293	0.293
Kurtosis		10.151	26.98	5.878	7.617	-1.352	0.412	64	15.252	1.474	22.503	3.115		-0.502	0.253
Std. Error of Kurtosis		0.578	0.578	0.578	0.578	0.578	0.578	1	0.578	0.578	0.578	0.578	0.578	0.578	0.578
Minimum		0.4	-31.713	0.017	0.012	0	0	90,358	28.215	0.382	0.077	-3.536	0	0	2
Maximum		12.1	45.36	0.285	0.349	1	0.799	14,675,768	794.915	8.017	2.412	8.549	0	500	6
Percentiles	25	1	0.527	0.053	0.042	0.131	0.023	232,910	96.677	3.752	0.345	1.027	0	100	3
	50	1.75	0.936	0.069	0.066	0.579	0.132	366,715	137.113	4.495	0.47	1.516	0	200	3
	75	2.75	1.872	0.1	0.1	0.896	0.319	554,257	196.596	5.136	0.627	2.622	0	300	4

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Tests of Normality - McNichols Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.217	67	0	0.712	67	0
DTNWComp	0.378	67	0	0.392	67	0
ƃCFO	0.175	67	0	0.812	67	0
ƃWC	0.155	67	0	0.764	67	0
AQMcNichols	0.141	67	0.002	0.873	67	0
DTNAAQ	0.175	67	0	0.851	67	0
LAmount	0.378	67	0	0.201	67	0
OpCycle	0.179	67	0	0.713	67	0
FirmSize	0.073	67	.200*	0.973	67	0.147
Leverage	0.142	67	0.002	0.7	67	0
Growth	0.194	67	0	0.818	67	0
Interest	0.227	67	0	0.89	67	0
CovNum	0.284	67	0	0.867	67	0

DTNWR - Stage 1 of Two Stage Least Squares - McNichols Model

Dependent Variable	CovThres

	DTNWComp	ΔCFO	ΔWC	AQMcNichols	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.096	-5.26	3.952	0.748	0.597	0	0.001	-0.298	5.551	0.042	0
T Values	3.233	-0.857	1.21	1.011	0.507	-3.064	0.279	-1.691	5.088	0.373	-1.104
Significance	0.002	0.395	0.232	0.317	0.614	0.003	0.781	0.096	0	0.711	0.274
VIF	1.353	2.466	1.22	2.092	2.003	3.655	1.417	1.626	3.249	1.409	1.209

R-Squared	52.30%
Adjusted R-Squared	42.80%
Regression Sig.	0.00%
Breusch-Pagan Test	75.40%

Dependent Variable: Interest

	DTNWComp	ΔCFO	ΔWC	AQMcNichols	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	3.475	807.28	-370.513	67.891	35.75	0	0.125	8.274	-96.18	8.705	0
T Values	1.24	1.392	-1.2	0.97	0.321	0.412	0.687	0.497	-0.933	0.824	-0.3
Significance	0.22	0.169	0.235	0.336	0.749	0.682	0.495	0.621	0.355	0.414	0.765
VIF	1.353	2.466	1.22	2.092	2.003	3.655	1.417	1.626	3.249	1.409	1.209

R-Squared	19.40%
Adjusted R-Squared	3.20%
Regression Sig.	30.80%

Dependent Variable: CovNum

	DTNWComp	ΔCFO	ΔWC	AQMcNichols	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.004	0.431	1.055	-0.034	0.247	0	-0.002	-0.068	-0.161	0.053	0
T Values	0.214	0.102	0.468	-0.067	0.305	0.484	-1.183	-0.562	-0.214	0.694	0.818
Significance	0.831	0.919	0.641	0.947	0.762	0.63	0.242	0.577	0.831	0.491	0.417
VIF	1.353	2.466	1.22	2.092	2.003	3.655	1.417	1.626	3.249	1.409	1.209

R-Squared	7.90%
Adjusted R-Squared	0.00%
Regression Sig.	93.60%

Dependent Variable: CR

	DTNWComp	ΔCFO	ΔWC	AQMcNichols	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	-0.001	-1.577	0.28	-0.261	0.274	0	0	0.069	-0.279	0	0
T Values	-0.071	-0.615	0.236	-0.892	0.647	0.629	0.344	0.877	-0.654	0	-0.013
Significance	0.944	0.543	0.815	0.379	0.522	0.533	0.733	0.387	0.517	1	0.99
VIF	1.827	3.397	1.481	2.627	2.161	5.661	1.404	2.388	4.741	2.015	1.388

R-Squared	13.60%
Adjusted R-Squared	0.00%
Regression Sig.	89.90%

Dependent Variable: ICR

	DTNWComp	ΔCFO	ΔWC	AQMcNichols	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth
Beta Values	0.006	0.854	0.226	0.481	-1.211	0	-0.004	0.067	-1.142	-0.12
T Values	0.221	0.115	0.065	0.562	-0.959	0.841	-1.768	0.325	-1.054	-0.764
Significance	0.828	0.91	0.949	0.582	0.352	0.413	0.096	0.75	0.307	0.456
VIF	1.975	5.896	2.283	3.137	2.928	7.942	1.711	3.954	6.847	1.338

R-Squared	30.20%
Adjusted R-Squared	0.00%
Regression Sig.	71.70%

DTNWR - Stage 2 of Two Stage Least Squares - McNichols Model

Dependent Variable: CovThres

Table 4.2.5.5b

	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ΔCFO	ΔWC	AQMcNichols	DTNAAQ	OpCycle	Leverage	Growth	SIC2
Beta Values	-0.031	-0.333	-0.051	-2.769	0.291	37.012	-11.451	3.871	3.305	0.003	0.495	0.61	0
T Values	-0.1	-1.475	-2.762	-1.489	4.208	2.241	-1.478	2.482	2.268	0.626	0.323	2.426	-0.435
Significance	0.921	0.146	0.008	0.142	0	0.029	0.145	0.016	0.027	0.534	0.748	0.019	0.665
VIF	1.277	1.413	39.816	7.775	7.371	17.928	6.88	9.321	3.079	6.287	6.436	7.164	3.194

R-Squared	54.20%
Adjusted R-Squared	43.00%
Regression Sig.	0.00%
Breusch-Pagan Test	74.70%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ΔCFO	ΔWC	AQMcNichols	DTNAAQ	OpCycle	Leverage	Growth	SIC2
CovThres	1.000	-.044	.063	-.084	.095	.431	-.022	.172	.052	.062	-.080	.437	-.015	-.064
CRhat		1.000	-.183	-.181	.277	-.112	-.042	.046	-.113	-.077	-.281	-.038	.124	-.007
ICRhat			1.000	-.140	.094	.216	.069	.069	-.156	-.041	-.061	.363	-.191	.138
Inthat				1.000	-.074	.208	.350	-.137	.503	.449	.486	-.254	.529	-.172

CovNumhat					1.000	.075	.118	.047	.048	.277	-.556	.299	.270	.417
DTNWComp						1.000	-.180	.069	-.233	-.071	.004	.072	.221	-.058
ɕCFO							1.000	.286	.049	.025	.332	.348	-.188	-.116
ɕWC								1.000	.013	.034	.204	.004	-.078	-.139
AQMcNichols									1.000	.637	.087	-.019	.199	.040
DTNAAQ										1.000	.132	-.100	.231	.227
OpCycle											1.000	-.241	.025	-.050
Leverage												1.000	-.287	.000
Growth													1.000	-.128
SIC2														1.000

Dependent Variable	**ICR**

Table 4.2.5.5c

	CRhat	**DTNWRhat**	**Inthat**	**CovNum**	**DTNWComp**	**ɕCFO**	**ɕWC**	**AQMcNichols**	**Growth**
Beta Values	0.506	-0.887	-0.037	-1.73	0.238	25.325	-8.603	4.289	0.225
T Values	0.026	0.006	0.006	0.087	0.006	0.018	0.014	0.007	0.215
Significance	0.77	0.067	0.053	0.194	0.036	0.058	0.322	0.069	0.357
VIF	1.299	14.866	18.95	5.141	27.686	17.176	3.11	14.556	2.798

R-Squared	56.60%
Adjusted R-Squared	33.60%
Regression Sig.	5.20%

Dependent Variable	**CovNum**

Table 4.2.5.5d

	CRhat	**ICRhat**	**DTNWRhat**	**Inthat**	**DTNWComp**	**ɕCFO**	**ɕWC**	**AQMcNichols**	**DTNAAQ**	**SIC2**
Beta Values	0.69	0.398	-0.043	0	0.009	0.816	-0.496	0.271	0.266	0
T Values	4.106	3.187	-0.254	0.042	0.209	0.198	-0.221	0.418	0.352	0.356
Significance	0	0.002	0.8	0.967	0.835	0.844	0.826	0.678	0.726	0.723
VIF	1.094	1.233	4.853	8.437	7.435	3.179	1.641	4.585	2.352	1.573

R-Squared	30.80%
Adjusted R-Squared	18.50%
Regression Sig.	1.50%

Dependent Variable	**Interest**

Table 4.2.5.5e

	CRhat	**ICRhat**	**DTNWRhat**	**CovNumhat**	**DTNWComp**	**ɕCFO**	**ɕWC**	**AQMcNichols**	**DTNAAQ**	**Leverage**	**Growth**	**SIC2**
Beta Values	-0.709	-24.259	-25.963	-88.647	6.861	737.536	-146.117	67.979	89.691	53.459	12.956	0
T Values	-0.025	-1.15	-0.865	-0.882	1.59	1.499	-0.404	0.965	0.757	0.398	1.081	0.121
Significance	0.981	0.255	0.391	0.382	0.118	0.14	0.687	0.339	0.452	0.692	0.284	0.904
VIF	1.275	1.388	6.126	2.549	3.227	1.785	1.678	2.133	2.281	5.55	1.823	1.663

R-Squared	21.30%
Adjusted R-Squared	3.80%
Regression Sig.	29.70%

Dependent Variable	**CR**

Table 4.2.5.5f

	ICRhat	**DTNWRhat**	**Inthat**	**CovNum**	**DTNWComp**	**ɕCFO**	**ɕWC**	**AQMcNichols**	**DTNAAQ**
Beta Values	0.147	-0.058	0.001	-0.055	-0.006	-3.89	1.118	-0.149	0.125
T Values	1.826	-0.585	0.454	-0.183	-0.211	-1.575	0.862	-0.356	0.312
Significance	0.076	0.562	0.652	0.856	0.834	0.124	0.394	0.724	0.757
VIF	1.53	3.185	8.373	1.528	5.832	3.596	2.022	6.183	2.227

R-Squared	19.90%
Adjusted R-Squared	0.00%
Regression Sig.	46.40%

DEBT TO TANGIBLE NET WORTH (DTNWR) RATIO FINANCIAL COVENANT – FRANCIS MODEL ANALYSIS

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Francis Model - Descriptives - Table 4.2.5.6a

		CovThres	**DTNWComp**	**ɕCFO**	**ɕTCA**	**AQFrancis**	**DTNAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	67	67	67	67	67	67	67	67	67	67	67	67	67	67
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.325	1.771	0.082	0.073	0.419	0.157	637,238	160.72	4.482	0.516	2.078	0	207.09	3.358
Median		1.75	0.936	0.069	0.063	0.35	0.062	366,715	137.113	4.495	0.47	1.516	0	200	3
Std. Deviation		1.977	7.221	0.047	0.042	0.368	0.203	1,761,168	114.105	1.334	0.304	1.954	0	143.667	0.98
Skewness		2.824	2.069	2.102	1.698	0.136	1.372	8	3.262	-0.175	3.804	1.274		0.123	0.71
Std. Error of Skewness		0.293	0.293	0.293	0.293	0.293	0.293	0	0.293	0.293	0.293	0.293	0.293	0.293	0.293
Kurtosis		10.151	26.98	5.878	4.095	-1.591	0.751	64	15.252	1.474	22.503	3.115		-0.502	0.253
Std. Error of Kurtosis		0.578	0.578	0.578	0.578	0.578	0.578	1	0.578	0.578	0.578	0.578	0.578	0.578	0.578
Minimum		0.4	-31.713	0.017	0.015	0	0	90,358	28.215	0.382	0.077	-3.536	0	0	2
Maximum		12.1	45.36	0.285	0.241	0.983	0.71	14,675,768	794.915	8.017	2.412	8.549	0	500	6

	25	1	0.527	0.053	0.047	0	0	232,910	96.677	3.752	0.345	1.027	0	100	3
Percentiles	50	1.75	0.936	0.069	0.063	0.35	0.062	366,715	137.113	4.495	0.47	1.516	0	200	3
	75	2.75	1.872	0.1	0.087	0.771	0.231	554,257	196.596	5.136	0.627	2.622	0	300	4

Debt-to-Tangible Net Worth (DTNWR) Ratio Covenant - Tests of Normality - Francis Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.217	67	0	0.712	67	0
DTNWComp	0.378	67	0	0.392	67	0
ƓCFO	0.175	67	0	0.812	67	0
ƓTCA	0.138	67	0.003	0.867	67	0
AQFrancis	0.186	67	0	0.859	67	0
DTNAAQ	0.22	67	0	0.772	67	0
LAmount	0.378	67	0	0.201	67	0
OpCycle	0.179	67	0	0.713	67	0
FirmSize	0.073	67	.200*	0.973	67	0.147
Leverage	0.142	67	0.002	0.7	67	0
Growth	0.194	67	0	0.818	67	0
Interest	0.227	67	0	0.89	67	0
CovNum	0.284	67	0	0.867	67	0

DTNWR - Stage 1 of Two Stage Least Squares - Francis Model

Dependent Variable	CovThres

	DTNWComp	ƓCFO	ƓTCA	AQFrancis	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.084	-0.549	6.062	-0.583	2.617	0	0	-0.111	5.945	0.095	0
T Values	3.022	-0.087	1.148	-0.769	1.891	-3.555	-0.223	-0.637	5.557	0.896	-0.423
Significance	0.004	0.931	0.256	0.445	0.064	0.001	0.824	0.527	0	0.374	0.674
VIF	1.231	2.678	1.502	2.362	2.402	3.531	1.589	1.627	3.205	1.306	1.152

R-Squared	53.60%
Adjusted R-Squared	44.30%
Regression Sig.	0.00%
Breusch-Pagan Test	16.50%

Dependent Variable	Interest

	DTNWComp	ƓCFO	ƓTCA	AQFrancis	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	2.658	941.392	-246.571	100.353	8.337	0	0.043	16.072	-108.92	11.931	0
T Values	0.997	1.562	-0.489	1.386	0.063	0.375	0.224	0.969	-1.066	1.176	0.218
Significance	0.323	0.124	0.627	0.171	0.95	0.709	0.823	0.337	0.291	0.245	0.829
VIF	1.231	2.678	1.502	2.362	2.402	3.531	1.589	1.627	3.205	1.306	1.152

R-Squared	19.80%
Adjusted R-Squared	3.70%
Regression Sig.	28.80%

Dependent Variable	CovNum

	DTNWComp	ƓCFO	ƓTCA	AQFrancis	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	0.004	1.302	0.821	-0.207	0.498	0	-0.002	-0.051	-0.11	0.061	0
T Values	0.207	0.295	0.223	-0.391	0.516	0.406	-1.177	-0.42	-0.147	0.819	0.983
Significance	0.837	0.769	0.825	0.698	0.608	0.687	0.244	0.676	0.884	0.416	0.33
VIF	1.231	2.678	1.502	2.362	2.402	3.531	1.589	1.627	3.205	1.306	1.152

R-Squared	7.90%
Adjusted R-Squared	0.00%
Regression Sig.	93.70%

Dependent Variable	CR

	DTNWComp	ƓCFO	ƓTCA	AQFrancis	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	SIC2
Beta Values	-0.001	0.228	-1.73	-0.397	0.744	0	0	0.057	-0.33	0.008	0
T Values	-0.041	0.081	-0.764	-1.459	1.528	0.652	0.334	0.795	-0.806	0.202	-0.034
Significance	0.968	0.936	0.45	0.154	0.136	0.519	0.741	0.432	0.426	0.841	0.973
VIF	1.444	4.298	2.542	2.415	2.429	5.181	1.657	2.148	4.633	1.896	1.299

R-Squared	18.70%
Adjusted R-Squared	0.00%
Regression Sig.	72.10%

Dependent Variable	ICR

	DTNWComp	ƓCFO	ƓTCA	AQFrancis	DTNAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth

R-Squared	48.70%

Beta Values	0.003	2.103	-2.161	-0.102	-1.603	0	-0.002	0.048	-1.26	-0.089
T Values	0.16	0.335	-0.477	-0.147	-1.318	1.161	-1.361	0.345	-1.401	-0.652
Significance	0.875	0.742	0.64	0.885	0.206	0.263	0.192	0.734	0.18	0.523
VIF	1.642	5.747	3.152	3.076	3.332	7.902	1.661	2.387	6.413	1.358

Adjusted R-Squared	16.60%
Regression Sig.	22.10%

DTNWR - Stage 2 of Two Stage Least Squares - Francis Model

Table 4.2.5.6b

Dependent Variable	CovThres

	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ϬCFO	ϬTCA	AQFrancis	DTNAAQ	FirmSize	Leverage	Growth	SIC2
Beta Values	-0.123	-0.329	-0.082	-1.775	0.317	78.742	-12.382	7.157	4.228	1.153	-2.871	1.158	0
T Values	-0.415	-1.555	-3.177	-1.549	4.443	2.859	-1.518	2.606	2.944	2.678	-1.205	3.213	2.093
Significance	0.68	0.126	0.002	0.127	0	0.006	0.135	0.012	0.005	0.01	0.233	0.002	0.041
VIF	1.254	1.372	82.192	3.043	8.098	51.426	3.618	31.277	2.609	10.086	16.026	15.163	2.125

R-Squared	55.60%
Adjusted R-Squared	44.80%
Regression Sig.	0.00%
Breusch-Pagan Test	19.80%

Pearson Correlations

	CovThres	CRhat	ICRhat	Inthat	CovNumhat	DTNWComp	ϬCFO	ϬTCA	AQFrancis	DTNAAQ	FirmSize	Leverage	Growth	SIC2
CovThres	1.000	-.040	.066	-.086	.107	.431	-.022	.041	.072	.201	-.046	.437	-.015	-.064
CRhat		1.000	-.185	-.079	.298	-.111	-.042	.003	-.007	.075	-.173	-.038	.123	-.007
ICRhat			1.000	-.111	.079	.216	.060	-.081	-.087	-.109	.076	.364	-.188	.170
Inthat				1.000	-.063	.206	.347	.195	.583	.384	.087	-.252	.523	-.170
CovNumhat					1.000	.075	.119	.089	-.028	.045	-.450	.299	.271	.418
DTNWComp						1.000	-.180	-.128	-.119	.005	.155	.072	.221	-.058
ϬCFO							1.000	.476	.139	-.025	-.498	.348	-.188	-.116
ϬTCA								1.000	.213	.211	-.329	-.002	.010	-.180
AQFrancis									1.000	.715	-.184	.112	.080	-.091
DTNAAQ										1.000	-.157	-.023	.048	-.095
FirmSize											1.000	-.254	.182	-.145
Leverage												1.000	-.287	.000
Growth													1.000	-.128
SIC2														1.000

Table 4.2.5.6c

Dependent Variable	ICR

	CRhat	DTNWRhat	Inthat	CovNum	DTNWComp	ϬCFO	AQFrancis	DTNAAQ	FirmSize
Beta Values	0.58	-0.456	-0.016	0.67	0.092	8.562	1.726	-1.367	0.349
T Values	3.054	-2.784	-2.434	1.525	2.393	1.893	2.084	-1.522	2.435
Significance	0.007	0.013	0.026	0.146	0.029	0.075	0.053	0.146	0.026
VIF	1.5	6.985	7.715	1.639	9.492	5.097	7.604	3.116	4.375

R-Squared	68.20%
Adjusted R-Squared	51.30%
Regression Sig.	0.06%

Table 4.2.5.6d

Dependent Variable	CovNum

	CRhat	ICRhat	DTNWRhat	Inthat	DTNWComp	ϬCFO	ϬTCA	AQFrancis	DTNAAQ	LAmount
Beta Values	0.622	0.371	-0.032	0.001	0	-1.104	1.459	-0.12	0.106	0
T Values	3.661	2.979	-0.227	0.312	-0.014	-0.262	0.458	-0.196	0.12	0.359
Significance	0.001	0.004	0.822	0.756	0.989	0.794	0.649	0.845	0.905	0.721
VIF	1.07	1.237	3.298	4.528	3.829	3.137	1.442	4.07	2.563	1.907

R-Squared	26.90%
Adjusted R-Squared	13.80%
Regression Sig.	4.40%

Table 4.2.5.6e

Dependent Variable	Interest

	CRhat	ICRhat	DTNWRhat	CovNumhat	DTNWComp	ϬCFO	ϬTCA	AQFrancis	DTNAAQ	Growth	SIC2
Beta Values	-11.079	-21.574	-15.791	-58.174	4.725	797.13	-163.029	73.946	58.539	16.562	0
T Values	-0.398	-1.123	-0.935	-0.675	1.426	1.717	-0.332	1.034	0.437	1.517	0.475
Significance	0.693	0.266	0.354	0.502	0.16	0.092	0.741	0.306	0.664	0.135	0.637
VIF	1.218	1.243	2.009	1.895	1.929	1.611	1.446	2.338	2.502	1.533	1.591

R-Squared	20.90%
Adjusted R-Squared	5.10%
Regression Sig.	23.80%

Dependent Variable	CR

Table 4.2.5.6f

	ICRhat	DTNWRhat	Inthat	CovNum	DTNWComp	ΘCFO	ΘTCA	AQFrancis	DTNAAQ	LAmount	OpCycle
Beta Values	0.144	-0.044	0.002	-0.262	-0.01	-3.193	0.302	-0.706	0.975	0	0
T Values	1.878	-0.543	0.929	-0.587	-0.502	-1.209	0.13	-1.726	1.829	0.527	-0.341
Significance	0.069	0.591	0.359	0.561	0.619	0.235	0.897	0.093	0.076	0.602	0.735
VIF	1.503	2.223	4.974	3.555	3.579	4.217	2.925	6.014	3.209	3.303	3.131

R-Squared	26.20%
Adjusted R Squared	2.30%
Regression Sig.	39.30%

QUICK RATIO FINANCIAL COVENANT – JONES MODEL ANALYSIS

Quick Ratio Covenant - Jones Model - Descriptives - Table 4.2.6.1a

		CovThres	QRComp	ΘCFO	ΘTA	AQJones	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.067	2.028	0.161	0.105	0.218	0.079	393,126	179.24	5.039	0.398	3.427	0.026	278.846	2.846
Median		1	1.846	0.083	0.082	0	0	340,870	166.824	4.821	0.345	2.167	0	200	3
Std. Deviation		0.364	0.888	0.44	0.117	0.299	0.12	276,211	121.923	1.307	0.169	3.206	0.16	110.104	1.04
Skewness		0.918	1.467	6.093	4.606	1.033	1.707	2	3.451	0.685	1.071	2.362	6.245	1.074	0.027
Std. Error of Skewness		0.378	0.378	0.378	0.378	0.378	0.378	0	0.378	0.378	0.378	0.378	0.378	0.378	0.378
Kurtosis		0.588	2.769	37.674	24.923	-0.47	2.876	4	17.065	-0.111	0.639	7.705	39	-0.321	1.517
Std. Error of Kurtosis		0.741	0.741	0.741	0.741	0.741	0.741	1	0.741	0.741	0.741	0.741	0.741	0.741	0.741
Minimum		0.5	0.676	0.023	0.022	0	0	51,756	35.185	2.851	0.139	0	0	200	1
Maximum		2	4.885	2.819	0.749	0.842	0.502	1,375,347	794.915	8.017	0.873	17.122	1	500	6
Percentiles	25	0.75	1.462	0.053	0.05	0	0	187,796	110.312	4.133	0.282	1.356	0	200	3
	50	1	1.846	0.083	0.082	0	0	340,870	166.824	4.821	0.345	2.167	0	200	3
	75	1.25	2.455	0.12	0.111	0.421	0.142	446,352	221.639	5.764	0.467	5.371	0	350	3

Quick Ratio Covenant - Tests of Normality - Jones Model - Table 4.2.6.1b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.162	39	0.011	0.926	39	0.013
QRComp	0.159	39	0.015	0.883	39	0.001
ΘCFO	0.411	39	0	0.238	39	0
ΘTA	0.253	39	0	0.517	39	0
AQJones	0.314	39	0	0.731	39	0
QRAAQ	0.304	39	0	0.716	39	0
LAmount	0.193	39	0.001	0.84	39	0
OpCycle	0.177	39	0.003	0.69	39	0
FirmSize	0.109	39	.200*	0.949	39	0.075
Leverage	0.159	39	0.014	0.908	39	0.004
Growth	0.22	39	0	0.758	39	0
Recession	0.538	39	0	0.15	39	0
Interest	0.353	39	0	0.716	39	0
CovNum	0.328	39	0	0.815	39	0

QR - Stage 1 of Two Stage Least Squares - Jones Model

Dependent Variable	CovThres

QRComp	ΘCFO	ΘTA	AQJones	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2

R-Squared	64.50%

Beta Values	0.316	-0.151	-0.435	-0.146	1.1	0	0	-0.068	0.361	0.012	-0.024	0
T Values	0	0.618	0.697	0.639	0.139	0.012	0.762	0.124	0.337	0.463	0.94	0.258
Significance	0.527	0.104	0.108	0.214	0.241	0.649	0.685	0.574	0.465	0.669	0.731	0.679
VIF	1.897	9.593	9.232	4.662	4.145	1.542	1.459	1.741	2.151	1.494	1.368	1.472

Adjusted R Squared	48.10%
Regression Sig.	0.02%
Breusch-Pagan Test	91.40%

Dependent Variable	Interest

	QRComp	ϬCFO	ϬTA	AQJones	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	23.932	61.013	-77.534	45.68	-40.238	0	0.146	-11.273	14.111	11.877	-24.241	0
T Values	0.944	0.531	-0.183	0.387	-0.145	-1.016	0.9	-0.683	0.099	1.906	-0.203	-0.755
Significance	0.354	0.6	0.856	0.702	0.886	0.319	0.377	0.501	0.922	0.068	0.841	0.457
VIF	1.897	9.593	9.232	4.662	4.145	1.542	1.459	1.741	2.151	1.494	1.368	1.472

R-Squared	42.70%
Adjusted R Squared	16.20%
Regression Sig.	14.90%

Dependent Variable	CovNum

	QRComp	ϬCFO	ϬTA	AQJones	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.215	-1.332	3.457	-2.053	1.887	0	-0.001	0.071	0.057	-0.033	-1.85	0
T Values	0.969	-1.326	0.933	-1.987	0.779	1.479	-0.642	0.495	0.046	-0.608	-1.772	-0.993
Significance	0.342	0.197	0.359	0.058	0.443	0.151	0.526	0.625	0.964	0.548	0.088	0.33
VIF	1.897	9.593	9.232	4.662	4.145	1.542	1.459	1.741	2.151	1.494	1.368	1.472

R-Squared	50.90%
Adjusted R Squared	28.20%
Regression Sig.	4.10%

QR - Stage 2 of Two Stage Least Squares - Jones Model

Table 4.2.6.1c

Dependent Variable	CovThres

	Inthat	CovNumhat	QRComp	ϬCFO	ϬTA	AQJones	QRAAQ	LAmount	FirmSize	Leverage	SIC2
Beta Values	0.001	0.022	0.301	-0.136	-0.566	-0.094	1.048	0	-0.058	0.409	0
T Values	0.608	0.137	3.576	-0.502	-0.565	-0.239	1.509	-1.608	-1.124	1.156	-0.8
Significance	0.549	0.892	0.001	0.619	0.577	0.813	0.143	0.12	0.271	0.258	0.431
VIF	4.865	7.803	3.163	8.007	7.792	7.851	3.936	3.501	2.59	2.023	1.76

R-Squared	64.00%
Adjusted R Squared	49.30%
Regression Sig.	0.01%
Breusch-Pagan Test	86.10%

Pearson Correlations

	CovThres	Inthat	CovNumhat	QRComp	ϬCFO	ϬTA	AQJones	QRAAQ	LAmount	FirmSize	Leverage	SIC2
CovThres	1.000	.507	-.154	.652	.140	.086	.200	.257	-.166	-.123	-.237	-.129
Inthat		1.000	-.537	.506	.565	.549	.318	.092	-.293	-.500	-.195	-.168
CovNumhat			1.000	-.018	-.485	-.493	-.624	-.395	.539	.320	.276	-.155
QRComp				1.000	.330	.294	.166	.182	.028	-.002	-.487	.010
ϬCFO					1.000	.909	.325	.229	-.146	-.329	-.096	-.049
ϬTA						1.000	.407	.212	-.122	-.300	-.066	-.027
AQJones							1.000	.803	.056	-.117	-.161	-.074
QRAAQ								1.000	.132	.007	-.175	.004
LAmount									1.000	-.118	.294	-.116
FirmSize										1.000	-.136	-.120
Leverage											1.000	-.350
SIC2												1.000

Dependent Variable	CovNum

Table 4.2.6.1d

	QRhat	Inthat	QRComp	ϬCFO	ϬTA	AQJones	LAmount	OpCycle	SIC2
Beta Values	0.09	-0.003	0.208	-0.607	1.299	-1.488	0	-0.001	0
T Values	0.061	-0.771	0.522	-0.705	0.374	-2.457	1.592	-0.404	-0.893
Significance	0.952	0.447	0.605	0.486	0.711	0.02	0.122	0.689	0.379
VIF	8.857	3.942	5.99	6.882	7.956	1.568	1.708	1.55	1.253

R-Squared	44.00%
Adjusted R Squared	26.60%
Regression Sig.	2.80%

Dependent Variable	Interest

Table 4.2.6.1e

	QRhat	CovNumhat	QRComp	ϬCFO	ϬTA	AQJones	QRAAQ	Growth	FirmSize
Beta Values	132.585	-17.175	-11.209	49.638	50.797	34.991	-195.287	9.114	-3.21

R-Squared	39.70%
Adjusted R Squared	20.90%

T Values	1.012	-0.486	-0.269	0.501	0.134	0.276	-0.711	1.447	-0.216
Significance	0.32	0.63	0.79	0.62	0.894	0.784	0.483	0.159	0.83
VIF	5.815	2.72	5.445	7.561	7.813	5.676	4.309	1.618	1.494

Regression Sig.	6.10%

QUICK RATIO FINANCIAL COVENANT – MODIFIED JONES MODEL ANALYSIS

Quick Ratio Covenant - Modified Jones Model - Descriptives - Table 4.2.6.2a

		CovThres	QRComp	ϬCFO	ϬTA	AQModJones	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.067	2.028	0.161	0.105	0.19	0.063	393,126	179.24	5.039	0.398	3.427	0.026	278.846	2.846
Median		1	1.846	0.083	0.082	0	0	340,870	166.824	4.821	0.345	2.167	0	200	3
Std. Deviation		0.364	0.888	0.44	0.117	0.273	0.101	276,211	121.923	1.307	0.169	3.206	0.16	110.104	1.04
Skewness		0.918	1.467	6.093	4.606	1.18	1.896	2	3.451	0.685	1.071	2.362	6.245	1.074	0.027
Std. Error of Skewness		0.378	0.378	0.378	0.378	0.378	0.378	0	0.378	0.378	0.378	0.378	0.378	0.378	0.378
Kurtosis		0.588	2.769	37.674	24.923	0.009	3.957	4	17.065	-0.111	0.639	7.705	39	-0.321	1.517
Std. Error of Kurtosis		0.741	0.741	0.741	0.741	0.741	0.741	1	0.741	0.741	0.741	0.741	0.741	0.741	0.741
Minimum		0.5	0.676	0.023	0.022	0	0	51,756	35.185	2.851	0.139	0	0	200	1
Maximum		2	4.885	2.819	0.749	0.843	0.444	1,375,347	794.915	8.017	0.873	17.122	1	500	6
Percentiles	25	0.75	1.462	0.053	0.05	0	0	187,796	110.312	4.133	0.282	1.356	0	200	3
	50	1	1.846	0.083	0.082	0	0	340,870	166.824	4.821	0.345	2.167	0	200	3
	75	1.25	2.455	0.12	0.111	0.374	0.151	446,352	221.639	5.764	0.467	5.371	0	350	3

Quick Ratio Covenant - Tests of Normality - Modified Jonse Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CTqr	0.162	39	0.011	0.926	39	0.013
QuickRatio	0.159	39	0.015	0.883	39	0.001
StDevCFOSc	0.411	39	0	0.238	39	0
StDevTA	0.253	39	0	0.517	39	0
AQModJones	0.329	39	0	0.728	39	0
QRAAQ	0.299	39	0	0.685	39	0
LAmount	0.193	39	0.001	0.84	39	0
OpCycle	0.177	39	0.003	0.69	39	0
FirmSizeInTotAss	0.109	39	.200*	0.949	39	0.075
LeverageLE	0.159	39	0.014	0.908	39	0.004
MBRatio	0.22	39	0	0.758	39	0
Recession	0.538	39	0	0.15	39	0
INTqr	0.353	39	0	0.716	39	0
COVNqr	0.328	39	0	0.815	39	0

QR - Stage 1 of Two Stage Least Squares - Modified Jones Model

Dependent Variable: CovThres

	QRComp	ϬCFO	ϬTA	AQModJones	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.322	-0.173	-0.435	-0.158	1.209	0	0	-0.085	0.308	0.006	-0.025	0
T Values	4.774	-0.542	-0.37	-0.436	1.31	-2.462	-0.365	-1.86	0.806	0.375	-0.077	-1.368
Significance	0	0.593	0.714	0.667	0.202	0.021	0.718	0.074	0.428	0.711	0.939	0.183
VIF	1.899	10.458	10.068	5.202	4.622	1.471	1.472	1.888	2.214	1.501	1.428	1.602

R-Squared	63.00%
Adjusted R Squared	45.90%
Regression Sig.	0.03%
Breusch-Pagan Test	95.30%

Dependent Variable: Interest

	QRComp	ϬCFO	ϬTA	AQModJones	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	23.755	36.644	4.491	0.271	114.109	0	0.139	-14.645	5.253	11.655	-42.597	0
T Values	0.938	0.306	0.01	0.002	0.329	-1.122	0.857	-0.854	0.037	1.87	-0.35	-0.93
Significance	0.357	0.762	0.992	0.998	0.745	0.272	0.399	0.401	0.971	0.073	0.729	0.361
VIF	1.899	10.458	10.068	5.202	4.622	1.471	1.472	1.888	2.214	1.501	1.428	1.602

R-Squared	42.90%
Adjusted R Squared	16.60%
Regression Sig.	14.40%

Dependent Variable: CovNum

	QRComp	ϬCFO	ϬTA	AQModJones	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2

R-Squared	49.10%

Beta Values	0.217	-1.475	4.086	-2.349	2.845	0	-0.001	0.092	0.005	-0.029	-2.033	0
T Values	0.964	-1.382	1.038	-1.933	0.921	1.483	-0.625	0.604	0.004	-0.53	-1.873	-0.892
Significance	0.344	0.179	0.309	0.064	0.366	0.15	0.538	0.551	0.997	0.6	0.072	0.381
VIF	1.899	10.458	10.068	5.202	4.622	1.471	1.472	1.888	2.214	1.501	1.428	1.602

Adjusted R-Squared	25.60%
Regression Sig.	5.60%

QR - Stage 2 of Two Stage Least Squares - Modified Jones Model

Table 4.2.6.2b

Dependent Variable	**CovThres**

	Inthat	**CovNumhat**	**QRComp**	**ϬCFO**	**ϬTA**	**AQModJones**	**LAmount**	**OpCycle**	**Leverage**	**SIC2**
Beta Values	0.002	-0.04	0.282	-0.032	-1.055	0.106	0	0	0.404	0
T Values	1.429	-0.286	3.435	-0.112	-1.021	0.368	-1.041	-0.501	1.052	-0.363
Significance	0.164	0.777	0.002	0.912	0.316	0.716	0.307	0.62	0.302	0.719
VIF	3.063	5.404	2.749	8.154	7.575	3.197	2.146	1.669	2.17	1.377

R-Squared	59.10%
Adjusted R-Squared	44.40%
Regression Sig.	0.02%
Breusch-Pagan Test	96.00%

Pearson Correlations

	CovThres	**Inthat**	**CovNumhat**	**QRComp**	**ϬCFO**	**ϬTA**	**AQModJones**	**LAmount**	**OpCycle**	**Leverage**	**SIC2**
CovThres	1.000	.521	-.136	.652	.140	.086	.165	-.166	-.023	-.237	-.129
Inthat		1.000	-.523	.505	.563	.548	.336	-.293	.199	-.195	-.167
CovNumhat			1.000	-.018	-.494	-.501	-.609	.548	-.190	.281	-.158
QRComp				1.000	.330	.294	.190	.028	-.042	-.487	.010
ϬCFO					1.000	.909	.354	-.146	-.133	-.096	-.049
ϬTA						1.000	.456	-.122	-.051	-.066	-.027
AQModJones							1.000	.002	-.167	-.210	-.001
LAmount								1.000	-.299	.294	-.116
OpCycle									1.000	-.247	.170
Leverage										1.000	-.350
SIC2											1.000

Table 4.2.6.2c

Dependent Variable	**CovNum**

	QRhat	**Inthat**	**QRComp**	**ϬCFO**	**AQModJones**	**LAmount**	**OpCycle**	**SIC2**
Beta Values	-0.574	-0.001	0.351	-0.516	-1.358	0	-0.001	0
T Values	-0.368	-0.334	0.851	-0.874	-2.244	1.288	-0.55	-0.769
Significance	0.716	0.741	0.402	0.389	0.032	0.208	0.586	0.448
VIF	9.371	4.583	6.185	3.113	1.26	1.695	1.697	1.265

R-Squared	39.90%
Adjusted R-Squared	23.80%
Regression Sig.	3.40%

Table 4.2.6.2d

Dependent Variable	**Interest**

	QRhat	**CovNumhat**	**QRComp**	**ϬCFO**	**ϬTA**	**AQModJones**	**LAmount**	**OpCycle**	**SIC2**
Beta Values	247.702	-19.059	-37.661	29.265	246.086	-27.287	0	0.153	0
T Values	1.724	-0.368	-0.785	0.276	0.626	-0.258	0.532	0.933	-0.129
Significance	0.095	0.716	0.439	0.784	0.536	0.798	0.599	0.359	0.898
VIF	6.298	5.218	6.645	7.984	7.777	3.057	2.225	1.467	1.426

R-Squared	34.70%
Adjusted R-Squared	14.40%
Regression Sig.	13.20%

QUICK RATIO FINANCIAL COVENANT – PEASNELL MODEL ANALYSIS

Quick Ratio Covenant - Peasnell Model - Descriptives - Table 4.2.6.3a

		CovThres	**QRComp**	**ϬCFO**	**ϬWCA**	**AQPeasnell**	**QRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**Interest**	**CovNum**
N	Valid	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.067	2.028	0.161	0.129	0.381	0.115	393,126	179.24	5.039	0.398	3.427	0.026	278.846	2.846
Median		1	1.846	0.083	0.097	0.389	0.071	340,870	166.824	4.821	0.345	2.167	0	200	3
Std. Deviation		0.364	0.888	0.44	0.142	0.301	0.14	276,211	121.923	1.307	0.169	3.206	0.16	110.104	1.04
Skewness		0.918	1.467	6.093	4.411	0.099	1.643	2	3.451	0.685	1.071	2.362	6.245	1.074	0.027
Std. Error of Skewness		0.378	0.378	0.378	0.378	0.378	0.378	0	0.378	0.378	0.378	0.378	0.378	0.378	0.378

Kurtosis		0.588	2.769	37.674	22.787	-1.268	2.195	4	17.065	-0.111	0.639	7.705	39	-0.321	1.517
Std. Error of Kurtosis		0.741	0.741	0.741	0.741	0.741	0.741	1	0.741	0.741	0.741	0.741	0.741	0.741	0.741
Minimum		0.5	0.676	0.023	0.022	0	0	51,756	35.185	2.851	0.139	0	0	200	1
Maximum		2	4.885	2.819	0.891	0.962	0.551	1,375,347	794.915	8.017	0.873	17.122	1	500	6
Percentiles	25	0.75	1.462	0.053	0.061	0.072	0.003	187,796	110.312	4.133	0.282	1.356	0	200	3
	50	1	1.846	0.083	0.097	0.389	0.071	340,870	166.824	4.821	0.345	2.167	0	200	3
	75	1.25	2.455	0.12	0.133	0.611	0.165	446,352	221.639	5.764	0.467	5.371	0	350	3

Quick Ratio Covenant - Tests of Normality - Peasnell Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.162	39	0.011	0.926	39	0.013
QRComp	0.159	39	0.015	0.883	39	0.001
ƃCFO	0.411	39	0	0.238	39	0
ƃWCA	0.26	39	0	0.517	39	0
AQPeasnell	0.145	39	0.039	0.916	39	0.007
QRAAQ	0.213	39	0	0.789	39	0
LAmount	0.193	39	0.001	0.84	39	0
OpCycle	0.177	39	0.003	0.69	39	0
FirmSize	0.109	39	.200*	0.949	39	0.075
Leverage	0.159	39	0.014	0.908	39	0.004
Growth	0.22	39	0	0.758	39	0
Recession	0.538	39	0	0.15	39	0
Interest	0.353	39	0	0.716	39	0
CovNum	0.328	39	0	0.815	39	0

QR - Stage 1 of Two Stage Least Squares - Peasnell Model

Dependent Variable	CovThres											
	QRComp	ƃCFO	ƃWCA	AQPeasnell	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.328	-0.36	0.377	0.243	-0.755	0	0	-0.088	0.213	0.001	0.251	0
T Values	4.756	-1.203	0.379	0.961	-1.523	-2.262	-1.082	-1.946	0.582	0.035	0.736	-1.071
Significance	0	0.24	0.708	0.345	0.14	0.032	0.289	0.063	0.565	0.972	0.468	0.294
VIF	1.92	8.872	10.185	2.959	2.47	1.55	1.52	1.794	1.955	1.816	1.527	1.408

R-Squared	61.60%
Adjusted R Squared	43.90%
Regression Sig.	0.04%
Breusch-Pagan Test	98.60%

Dependent Variable	Interest											
	QRComp	ƃCFO	ƃWCA	AQPeasnell	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	20.259	36.859	70.214	-70.382	252.506	0	0.181	-6.519	8.484	12.186	-93.35	0
T Values	0.821	0.345	0.197	-0.778	1.424	-1.066	1.134	-0.402	0.065	1.834	-0.765	-0.999
Significance	0.419	0.733	0.845	0.444	0.166	0.296	0.267	0.691	0.949	0.078	0.451	0.327
VIF	1.92	8.872	10.185	2.959	2.47	1.55	1.52	1.794	1.955	1.816	1.527	1.408

R-Squared	46.40%
Adjusted R Squared	21.70%
Regression Sig.	8.70%

Dependent Variable	CovNum											
	QRComp	ƃCFO	ƃWCA	AQPeasnell	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.288	2.804	-13.043	1.003	1.679	0	0	0.17	0.702	0.052	-2.232	0
T Values	1.773	3.991	-5.571	1.686	1.441	1.595	-0.379	1.593	0.816	1.2	-2.785	-0.831
Significance	0.088	0	0	0.104	0.162	0.123	0.708	0.123	0.422	0.241	0.01	0.413
VIF	1.92	8.872	10.185	2.959	2.47	1.55	1.52	1.794	1.955	1.816	1.527	1.408

R-Squared	74.00%
Adjusted R Squared	62.10%
Regression Sig.	0.00%

QR - Stage 2 of Two Stage Least Squares - Peasnell Model

Table 4.2.6.3b

Dependent Variable	CovThres									
	Inthat	CovNumhat	QRComp	ƃWCA	AQPeasnell	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	SIC2
Beta Values	0.001	-0.137	0.355	-1.453	0.425	-0.683	0	-0.001	-0.061	0.304	0
T Values	0.481	-1.663	4.61	-2.218	1.723	-1.366	-1.284	-1.368	-1.228	0.829	-1.067
Significance	0.634	0.108	0	0.035	0.096	0.183	0.21	0.182	0.23	0.414	0.295

R-Squared	61.60%
Adjusted R-Squared	46.00%
Regression Sig.	0.02%
Breusch-Pagan Test	97.40%

VIF	5.218	2.906	2.484	4.577	2.924	2.61	2.22	1.802	2.223	2.044	1.598

Pearson Correlations

	CovThres	Inthat	CovNumhat	QRComp	ϬWCA	AQPeasnell	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	SIC2
CovThres	1.000	.422	-.157	.652	.208	-.003	-.021	-.166	-.023	-.123	-.237	-.129
Inthat		1.000	-.338	.485	.619	.173	.308	-.281	.192	-.479	-.187	-.161
CovNumhat			1.000	-.015	-.622	-.128	-.016	.447	-.155	.265	.229	-.129
QRComp				1.000	.358	.047	.115	.028	-.042	-.002	-.487	.010
ϬWCA					1.000	.356	.221	-.112	-.108	-.343	-.141	-.011
AQPeasnell						1.000	.683	.086	.186	-.110	-.118	.165
QRAAQ							1.000	.075	.004	-.162	-.129	.112
LAmount								1.000	-.299	-.118	.294	-.116
OpCycle									1.000	-.110	-.247	.170
FirmSize										1.000	-.136	-.120
Leverage											1.000	-.350
SIC2												1.000

Dependent Variable **CovNum**

Table 4.2.6.3c

	QRhat	Inthat	QRComp	ϬCFO	ϬWCA	AQPeasnell	QRAAQ	Leverage	Recession	SIC2
Beta Values	-1.419	0	0.839	1.841	-10.916	1.148	0.903	1.379	-2.133	0
T Values	-1.378	-0.009	2.755	2.683	-4.794	1.944	0.598	1.65	-2.309	-1.675
Significance	0.179	0.993	0.01	0.012	0	0.062	0.554	0.11	0.029	0.105
VIF	7.696	3.61	6.491	8.121	9.239	2.798	3.974	1.77	1.944	1.433

R-Squared	70.80%
Adjusted R-Squared	60.40%
Regression Sig.	0.00%

Dependent Variable **Interest**

Table 4.2.6.3d

	QRhat	CovNumhat	QRComp	ϬCFO	ϬWCA	AQPeasnell	QRAAQ	OpCycle	SIC2
Beta Values	309.212	81.242	-86.559	-140.772	1205.433	-231.052	347.576	0.38	0
T Values	2.199	1.853	-1.71	-1.08	2.035	-2.156	2.107	2.378	0.494
Significance	0.036	0.074	0.098	0.289	0.051	0.039	0.044	0.024	0.625
VIF	6.662	6.348	8.344	13.6	29.04	4.281	2.207	1.565	1.539

R-Squared	42.00%
Adjusted R-Squared	24.10%
Regression Sig.	4.00%

QUICK RATIO FINANCIAL COVENANT – DECHOW AND DICHEV (DD) MODEL ANALYSIS

Quick Ratio Covenant - Dechow andDichev (DD) Model - Descriptives - Table 4.2.6.4a

		CovThres	QRComp	ϬCFO	ϬWC	AQDD	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.067	2.028	0.161	0.081	0.284	0.077	393,126	179.24	5.039	0.398	3.427	0.026	278.846	2.846
Median		1	1.846	0.083	0.074	0.186	0.028	340,870	166.824	4.821	0.345	2.167	0	200	3
Std. Deviation		0.364	0.888	0.44	0.042	0.308	0.106	276,211	121.923	1.307	0.169	3.206	0.16	110.104	1.04
Skewness		0.918	1.467	6.093	1.278	0.838	1.635	2	3.451	0.685	1.071	2.362	6.245	1.074	0.027
Std. Error of Skewness		0.378	0.378	0.378	0.378	0.378	0.378	0	0.378	0.378	0.378	0.378	0.378	0.378	0.378
Kurtosis		0.588	2.769	37.674	3.4	-0.462	2.232	4	17.065	-0.111	0.639	7.705	39	-0.321	1.517
Std. Error of Kurtosis		0.741	0.741	0.741	0.741	0.741	0.741	1	0.741	0.741	0.741	0.741	0.741	0.741	0.741
Minimum		0.5	0.676	0.023	0.012	0	0	51,756	35.185	2.851	0.139	0	0	200	1
Maximum		2	4.885	2.819	0.232	0.984	0.418	1,375,347	794.915	8.017	0.873	17.122	1	500	6
Percentiles	25	0.75	1.462	0.053	0.051	0	0	187,796	110.312	4.133	0.282	1.356	0	200	3
	50	1	1.846	0.083	0.074	0.186	0.028	340,870	166.824	4.821	0.345	2.167	0	200	3
	75	1.25	2.455	0.12	0.099	0.555	0.101	446,352	221.639	5.764	0.467	5.371	0	350	3

Quick Ratio Covenant - Tests of Normality - DD Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.162	39	0.011	0.926	39	0.013
QRComp	0.159	39	0.015	0.883	39	0.001
ϬCFO	0.411	39	0	0.238	39	0
ϬWC	0.112	39	.200*	0.923	39	0.01
AQDD	0.178	39	0.003	0.851	39	0
QRAAQ	0.234	39	0	0.76	39	0
LAmount	0.193	39	0.001	0.84	39	0
OpCycle	0.177	39	0.003	0.69	39	0

FirmSize	0.109	39	.200*	0.949	39	0.075
Leverage	0.159	39	0.014	0.908	39	0.004
Growth	0.22	39	0	0.758	39	0
Recession	0.538	39	0	0.15	39	0
Interest	0.353	39	0	0.716	39	0
CovNum	0.328	39	0	0.815	39	0

QR - Stage 1 of Two Stage Least Squares - DD Model

Dependent Variable **CovThres**

	QRComp	ϭCFO	ϭWC	AQDD	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.326	-0.173	-1.678	0.051	0.206	0	0	-0.083	0.395	0.014	0.152	0
T Values	4.465	-0.949	-0.825	0.239	0.328	-2.353	-0.581	-1.727	0.983	0.762	0.491	-1.057
Significance	0	0.351	0.417	0.813	0.746	0.026	0.566	0.096	0.335	0.453	0.628	0.3
VIF	2.042	3.126	3.482	2.059	2.146	1.527	1.417	1.923	2.243	1.595	1.2	1.35

R-Squared	59.60%
Adjusted R-Squared	41.00%
Regression Sig.	0.06%
Breusch-Pagan Test	95.00%

Dependent Variable **Interest**

	QRComp	ϭCFO	ϭWC	AQDD	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	25.578	73.234	-484.587	-45.958	123.056	0	0.175	-14.801	38.364	13.44	-23.103	0
T Values	0.998	1.146	-0.678	-0.62	0.558	-1.057	1.124	-0.875	0.272	2.142	-0.212	-0.956
Significance	0.327	0.262	0.504	0.541	0.582	0.3	0.271	0.389	0.788	0.042	0.834	0.348
VIF	2.042	3.126	3.482	2.059	2.146	1.527	1.417	1.923	2.243	1.595	1.2	1.35

R-Squared	45.60%
Adjusted R-Squared	20.50%
Regression Sig.	9.90%

Dependent Variable **CovNum**

	QRComp	ϭCFO	ϭWC	AQDD	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.433	-1.126	3.174	-0.881	3.933	0	0	0.15	1.14	-0.06	-2.09	0
T Values	1.806	-1.883	0.475	-1.27	1.907	1.166	0.299	0.947	0.863	-1.025	-2.05	-0.371
Significance	0.083	0.071	0.639	0.215	0.068	0.254	0.767	0.352	0.396	0.315	0.051	0.713
VIF	2.042	3.126	3.482	2.059	2.146	1.527	1.417	1.923	2.243	1.595	1.2	1.35

R-Squared	46.60%
Adjusted R-Squared	22.00%
Regression Sig.	8.50%

QR - Stage 2 of Two Stage Least Squares - DD Model

Dependent Variable **CovThres**

Table 4.2.6.4b

	Inthat	CovNumhat	QRComp	ϭCFO	ϭWC	AQDD	QRAAQ	LAmount	Growth	SIC2
Beta Values	0.001	-0.052	0.271	-0.292	0.514	-0.071	0.413	0	-0.003	0
T Values	0.726	-0.415	3.366	-1.175	0.28	-0.314	0.513	-0.643	-0.1	-0.889
Significance	0.474	0.681	0.002	0.25	0.782	0.756	0.612	0.526	0.921	0.382
VIF	7.705	3.714	2.373	5.562	2.707	2.27	3.373	2.352	4.69	1.298

R-Squared	54.50%
Adjusted R-Squared	38.20%
Regression Sig.	0.06%
Breusch-Pagan Test	65.20%

Pearson Correlations

	CovThres	Inthat	CovNumhat	QRComp	ϭCFO	ϭWC	AQDD	QRAAQ	LAmount	Growth	SIC2
CovThres	1.000	.507	-.085	.652	.140	.059	-.077	-.101	-.166	.334	-.129
Inthat		1.000	-.416	.490	.547	.419	-.074	.091	-.284	.718	-.162
CovNumhat			1.000	-.018	-.507	-.430	-.078	.170	.563	-.234	-.162
QRComp				1.000	.330	.095	.052	-.088	.028	.283	.010
ϭCFO					1.000	.624	.335	.381	-.146	.147	-.049
ϭWC						1.000	.247	.056	-.037	.387	-.156
AQDD							1.000	.565	.096	-.152	-.031
QRAAQ								1.000	.119	-.120	-.063
LAmount									1.000	.051	-.116
Growth										1.000	-.058
SIC2											1.000

Dependent Variable **Interest**

Table 4.2.6.4c

	QRhat	CovNumhat	QRComp	ϬCFO	ϬWC	AQDD	QRAAQ	OpCycle	Growth
Beta Values	186.043	14.744	-37.885	125.373	-269.126	-39.42	32.362	0.226	12.215
T Values	1.485	0.402	-0.843	1.515	-0.45	-0.55	0.124	1.659	1.975
Significance	0.148	0.691	0.406	0.141	0.656	0.587	0.903	0.108	0.058
VIF	5.41	2.957	6.952	5.795	2.7	2.131	3.35	1.206	1.717

R-Squared	45.20%
Adjusted R-Squared	28.20%
Regression Sig.	2.20%

Dependent Variable	CovNum

Table 4.2.6.4bd

	QRhat	Inthat	QRComp	ϬCFO	ϬWC	AQDD	QRAAQ	Leverage
Beta Values	-2.254	0.001	1.097	-1.386	-2.056	-0.538	4.248	2.63
T Values	-1.514	0.146	2.54	-2.217	-0.359	-0.798	2.112	2.241
Significance	0.141	0.885	0.017	0.034	0.722	0.431	0.043	0.033
VIF	7.998	4.1	6.721	3.463	2.591	1.972	2.07	1.795

R-Squared	39.20%
Adjusted R-Squared	23.00%
Regression Sig.	3.80%

QUICK RATIO FINANCIAL COVENANT - MCNICHOLS MODEL ANALYSIS

Quick Ratio Covenant - McNichols Model - Descriptives - Table 4.2.6.5a

		CovThres	QRComp	ϬCFO	ϬWC	AQMcNichols	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.067	2.028	0.161	0.081	0.567	0.179	393,126	179.24	5.039	0.398	3.427	0.026	278.846	2.846
Median		1	1.846	0.083	0.074	0.606	0.115	340,870	166.824	4.821	0.345	2.167	0	200	3
Std. Deviation		0.364	0.888	0.44	0.042	0.342	0.183	276,211	121.923	1.307	0.169	3.206	0.16	110.104	1.04
Skewness		0.918	1.467	6.093	1.278	-0.529	1.107	2	3.451	0.685	1.071	2.362	6.245	1.074	0.027
Std. Error of Skewness		0.378	0.378	0.378	0.378	0.378	0.378	0	0.378	0.378	0.378	0.378	0.378	0.378	0.378
Kurtosis		0.588	2.769	37.674	3.4	-1.002	0.502	4	17.065	-0.111	0.639	7.705	39	-0.321	1.517
Std. Error of Kurtosis		0.741	0.741	0.741	0.741	0.741	0.741	1	0.741	0.741	0.741	0.741	0.741	0.741	0.741
Minimum		0.5	0.676	0.023	0.012	0	0	51,756	35.185	2.851	0.139	0	0	200	1
Maximum		2	4.885	2.819	0.232	1	0.693	1,375,347	794.915	8.017	0.873	17.122	1	500	6
Percentiles	25	0.75	1.462	0.053	0.051	0.295	0.032	187,796	110.312	4.133	0.282	1.356	0	200	3
	50	1	1.846	0.083	0.074	0.606	0.115	340,870	166.824	4.821	0.345	2.167	0	200	3
	75	1.25	2.455	0.12	0.099	0.838	0.322	446,352	221.639	5.764	0.467	5.371	0	350	3

Quick Ratio Covenant - Tests of Normality - McNichols Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.162	39	0.011	0.926	39	0.013
QRComp	0.159	39	0.015	0.883	39	0.001
ϬCFO	0.411	39	0	0.238	39	0
ϬWC	0.112	39	.200*	0.923	39	0.01
AQMcNichols	0.156	39	0.018	0.891	39	0.001
QRAAQ	0.177	39	0.003	0.864	39	0
LAmount	0.193	39	0.001	0.84	39	0
OpCycle	0.177	39	0.003	0.69	39	0
FirmSize	0.109	39	.200*	0.949	39	0.075
Leverage	0.159	39	0.014	0.908	39	0.004
Growth	0.22	39	0	0.758	39	0
Recession	0.538	39	0	0.15	39	0
Interest	0.353	39	0	0.716	39	0
CovNum	0.328	39	0	0.815	39	0

QR - Stage 1 of Two Stage Least Squares - McNichols Model

Dependent Variable	CovThres

	QRComp	ϬCFO	ϬWC	AQMcNichols	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.308	-0.096	-1.597	-0.201	-0.11	0	0	-0.092	0.27	0.007	0.207	0
T Values	4.489	-0.595	-0.821	-1.179	-0.337	-2.004	-0.596	-2.056	0.707	0.395	0.701	-1.146
Significance	0	0.557	0.419	0.249	0.739	0.056	0.556	0.05	0.486	0.696	0.489	0.262

R-Squared	63.30%
Adjusted R Squared	46.40%
Regression Sig.	0.02%
Breusch-Pagan Test	81.00%

VIF	1.99	2.699	3.496	1.825	1.925	1.458	1.339	1.843	2.227	1.64	1.2	1.387

Dependent Variable	Interest											
	QRComp	**ΔCFO**	**ΔWC**	**AQMcNichols**	**QRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	23.766	77.638	-698.599	30.686	27.717	0	0.155	-15.466	60.876	15.143	-26.813	0
T Values	0.943	1.312	-0.979	0.489	0.231	-1.286	1.028	-0.938	0.434	2.389	-0.247	-0.972
Significance	0.354	0.201	0.337	0.629	0.819	0.21	0.314	0.357	0.668	0.024	0.807	0.34
VIF	1.99	2.699	3.496	1.825	1.925	1.458	1.339	1.843	2.227	1.64	1.2	1.387

R-Squared	46.00%
Adjusted R Squared	21.10%
Regression Sig.	9.30%

Dependent Variable	CovNum											
	QRComp	**ΔCFO**	**ΔWC**	**AQMcNichols**	**QRAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	0.371	-0.864	0.945	-0.397	1.242	0	0	0.107	1.161	-0.057	-2.094	0
T Values	1.496	-1.486	0.135	-0.644	1.051	1.265	0.092	0.661	0.843	-0.91	-1.962	-0.313
Significance	0.147	0.149	0.894	0.525	0.303	0.217	0.928	0.515	0.407	0.371	0.061	0.757
VIF	1.99	2.699	3.496	1.825	1.925	1.458	1.339	1.843	2.227	1.64	1.2	1.387

R-Squared	41.50%
Adjusted R Squared	14.50%
Regression Sig.	17.40%

QR - Stage 2 of Two Stage Least Squares - McNichols Model

Table 4.2.6.5b

Dependent Variable	CovThres										
	Inthat	**CovNumhat**	**QRComp**	**ΔCFO**	**ΔWC**	**AQMcNichols**	**QRAAQ**	**LAmount**	**FirmSize**	**Leverage**	**SIC2**
Beta Values	0	-0.111	0.358	-0.17	-1.544	-0.258	0.055	0	-0.08	0.452	0
T Values	-0.115	-0.835	4.125	-1.041	-0.85	-1.552	0.161	-1.098	-1.514	1.096	-1.237
Significance	0.909	0.411	0	0.307	0.403	0.132	0.873	0.282	0.142	0.283	0.227
VIF	3.682	4.377	3.261	2.838	3.131	1.768	2.138	2.412	2.624	2.665	1.556

R-Squared	62.90%
Adjusted R Squared	47.70%
Regression Sig.	0.01%
Breusch-Pagan Test	77.40%

Pearson Correlations

	CovThres	**Inthat**	**CovNumhat**	**QRComp**	**ΔCFO**	**ΔWC**	**AQMcNichols**	**QRAAQ**	**LAmount**	**FirmSize**	**Leverage**	**SIC2**
CovThres	1.000	.470	-.112	.652	.140	.059	-.210	-.196	-.166	-.123	-.237	-.129
Inthat		1.000	-.483	.488	.544	.418	.133	.130	-.283	-.481	-.188	-.162
CovNumhat			1.000	-.020	-.537	-.456	-.124	.076	.597	.355	.306	-.172
QRComp				1.000	.330	.095	.072	-.082	.028	-.002	-.487	.010
ΔCFO					1.000	.624	.188	.146	-.146	-.329	-.096	-.049
ΔWC						1.000	.177	-.122	-.037	-.538	.256	-.156
AQMcNichols							1.000	.524	.126	-.195	-.079	.064
QRAAQ								1.000	.059	-.024	-.040	-.088
LAmount									1.000	-.118	.294	-.116
FirmSize										1.000	-.136	-.120
Leverage											1.000	-.350
SIC2												1.000

Table 4.2.6.5c

Dependent Variable	Interest									
	QRhat	**CovNumhat**	**QRComp**	**ΔCFO**	**ΔWC**	**AQMcNichols**	**QRAAQ**	**LAmount**	**OpCycle**	**Growth**
Beta Values	203.941	29.94	-47.64	123.978	-423.512	82.344	17.374	0	0.204	15.449
T Values	1.421	0.681	-1.005	1.77	-0.695	1.112	0.145	-0.469	1.439	2.358
Significance	0.166	0.501	0.323	0.088	0.493	0.275	0.886	0.642	0.161	0.026
VIF	7.367	3.691	7.548	4.059	2.739	2.729	2.066	2.379	1.269	1.881

R-Squared	45.80%
Adjusted R-Squared	26.50%
Regression Sig.	3.50%

Table 4.2.6.5d

Dependent Variable	CovNum								
	QRhat	**Inthat**	**QRComp**	**ΔCFO**	**ΔWC**	**AQMcNichols**	**QRAAQ**	**OpCycle**	**SIC2**
Beta Values	-2.454	0	0.846	-1.087	0.037	-0.828	0.657	-0.001	0
T Values	-1.401	0.013	1.838	-1.697	0.006	-1.123	0.518	-0.704	-1.147
Significance	0.172	0.99	0.076	0.1	0.995	0.271	0.608	0.487	0.261
VIF	9.561	4.106	6.205	2.96	2.272	2.359	2.007	1.393	1.226

R-Squared	27.80%
Adjusted R-Squared	5.40%
Regression Sig.	31.00%

QUICK RATIO FINANCIAL COVENANT - FRANCIS MODEL ANALYSIS

Quick Ratio Covenant - Francis Model - Descriptives - Table 4.2.6.6a

		CovThres	QRComp	ϬCFO	ϬTCA	AQFrancis	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.067	2.028	0.161	0.098	0.41	0.118	393,126	179.24	5.039	0.398	3.427	0.026	278.846	2.846
Median		1	1.846	0.083	0.08	0.35	0.059	340,870	166.824	4.821	0.345	2.167	0	200	3
Std. Deviation		0.364	0.888	0.44	0.077	0.367	0.143	276,211	121.923	1.307	0.169	3.206	0.16	110.104	1.04
Skewness		0.918	1.467	6.093	3.355	0.207	1.156	2	3.451	0.685	1.071	2.362	6.245	1.074	0.027
Std. Error of Skewness		0.378	0.378	0.378	0.378	0.378	0.378	0	0.378	0.378	0.378	0.378	0.378	0.378	0.378
Kurtosis		0.588	2.769	37.674	14.172	-1.584	0.423	4	17.065	-0.111	0.639	7.705	39	-0.321	1.517
Std. Error of Kurtosis		0.741	0.741	0.741	0.741	0.741	0.741	1	0.741	0.741	0.741	0.741	0.741	0.741	0.741
Minimum		0.5	0.676	0.023	0.02	0	0	51,756	35.185	2.851	0.139	0	0	200	1
Maximum		2	4.885	2.819	0.47	0.983	0.522	1,375,347	794.915	8.017	0.873	17.122	1	500	6
Percentiles	25	0.75	1.462	0.053	0.056	0	0	187,796	110.312	4.133	0.282	1.356	0	200	3
	50	1	1.846	0.083	0.08	0.35	0.059	340,870	166.824	4.821	0.345	2.167	0	200	3
	75	1.25	2.455	0.12	0.105	0.724	0.194	446,352	221.639	5.764	0.467	5.371	0	350	3

Quick Ratio Covenant - Tests of Normality - Francis Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.162	39	0.011	0.926	39	0.013
QRComp	0.159	39	0.015	0.883	39	0.001
ϬCFO	0.411	39	0	0.238	39	0
ϬTCA	0.251	39	0	0.649	39	0
AQFrancis	0.16	39	0.013	0.859	39	0
QRAAQ	0.204	39	0	0.815	39	0
LAmount	0.193	39	0.001	0.84	39	0
OpCycle	0.177	39	0.003	0.69	39	0
FirmSize	0.109	39	.200*	0.949	39	0.075
Leverage	0.159	39	0.014	0.908	39	0.004
Growth	0.22	39	0	0.758	39	0
Recession	0.538	39	0	0.15	39	0
Interest	0.353	39	0	0.716	39	0
CovNum	0.328	39	0	0.815	39	0

QR - Stage 1 of Two Stage Least Squares - Francis Model

Dependent Variable: CovThres

	QRComp	ϬCFO	ϬTCA	AQFrancis	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.313	-0.132	-0.334	0.09	-0.409	0	0	-0.067	0.216	0.013	0.111	0
T Values	4.159	-0.566	-0.262	0.377	-0.683	-1.951	-0.77	-1.481	0.567	0.613	0.36	-0.895
Significance	0	0.576	0.795	0.709	0.501	0.062	0.448	0.151	0.576	0.545	0.722	0.379
VIF	2.121	4.984	4.592	3.64	3.459	1.849	1.731	1.65	1.966	2.052	1.154	1.421

R-Squared	58.60%
Adjusted R-Squared	39.50%
Regression Sig.	0.08%
Breusch-Pagan Test	31.80%

Dependent Variable: Interest

	QRComp	ϬCFO	ϬTCA	AQFrancis	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	32.757	-27.62	197.409	8.313	264.699	0	0.123	-13.818	15.138	6.235	-18.639	0
T Values	1.315	-0.359	0.469	0.105	1.337	-1.437	0.75	-0.925	0.12	0.919	-0.183	-1.405
Significance	0.2	0.723	0.643	0.917	0.193	0.163	0.46	0.363	0.905	0.367	0.856	0.172
VIF	2.121	4.984	4.592	3.64	3.459	1.849	1.731	1.65	1.966	2.052	1.154	1.421

R-Squared	50.50%
Adjusted R-Squared	27.60%
Regression Sig.	4.40%

Dependent Variable: CovNum

	QRComp	ϬCFO	ϬTCA	AQFrancis	QRAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.005	1.47	-14.411	-1.754	2.936	0	0.002	0.148	0.309	0.081	-1.962	0
T Values	0.03	2.731	-4.894	-3.181	2.122	2.755	1.666	1.416	0.351	1.705	-2.754	-0.703
Significance	0.976	0.011	0	0.004	0.044	0.011	0.108	0.169	0.729	0.1	0.011	0.488
VIF	2.121	4.984	4.592	3.64	3.459	1.849	1.731	1.65	1.966	2.052	1.154	1.421

R-Squared	72.90%
Adjusted R-Squared	60.40%
Regression Sig.	0.00%

QR - Stage 2 of Two Stage Least Squares - Francis Model

Dependent Variable	CovThres

Table 4.2.6.6b

	Inthat	CovNumhat	QRComp	ϬCFO	ϬTCA	AQFrancis	QRAAQ	OpCycle	FirmSize	SIC2
Beta Values	0.003	-0.066	0.195	0.061	-1.961	-0.058	-1.023	-0.001	-0.018	0
T Values	1.883	-0.694	2.511	0.282	-1.15	-0.253	-1.183	-1.272	-0.4	0.188
Significance	0.07	0.493	0.018	0.78	0.26	0.802	0.247	0.214	0.692	0.853
VIF	8.175	3.581	2.408	4.563	8.775	3.615	7.694	2.077	1.784	2.143

R-Squared	58.20%
Adjusted R-Squared	43.30%
Regression Sig.	0.02%
Breusch-Pagan Test	14.30%

Pearson Correlations

	CovThres	Inthat	CovNumhat	QRComp	ϬCFO	ϬTCA	AQFrancis	QRAAQ	OpCycle	FirmSize	SIC2
CovThres	1.000	.423	-.080	.652	.140	.157	-.154	-.045	-.023	-.123	-.129
Inthat		1.000	-.450	.465	.519	.660	.431	.624	.184	-.460	-.154
CovNumhat			1.000	-.015	-.405	-.692	-.311	-.233	-.156	.268	-.130
QRComp				1.000	.330	.284	-.046	.129	-.042	-.002	.010
ϬCFO					1.000	.835	.252	.461	-.133	-.329	-.049
ϬTCA						1.000	.281	.474	-.074	-.353	-.056
AQFrancis							1.000	.747	.162	-.327	.177
QRAAQ								1.000	-.127	-.313	.164
OpCycle									1.000	-.110	.170
FirmSize										1.000	-.120
SIC2											1.000

Dependent Variable	Interest

Table 4.2.6.6c

	QRhat	CovNumhat	QRComp	ϬCFO	ϬTCA	AQFrancis	QRAAQ	OpCycle	SIC2
Beta Values	274.096	14.921	-47.655	-23.389	562.826	6.692	341.363	0.213	0
T Values	2.169	0.457	-1.176	-0.347	1.024	0.092	1.72	1.593	-0.454
Significance	0.038	0.651	0.249	0.731	0.314	0.927	0.096	0.122	0.654
VIF	5.919	4.016	6.184	4.22	8.622	3.425	3.832	1.266	1.471

R-Squared	49.90%
Adjusted R-Squared	34.40%
Regression Sig.	0.08%

Dependent Variable	CovNum

Table 4.2.6.6d

	QRhat	Inthat	QRComp	ϬCFO	ϬTCA	AQFrancis	LAmount	Growth
Beta Values	-2.999	0.008	0.537	1.425	-17.567	-1.758	0	0.078
T Values	-2.435	2.134	1.688	2.798	-5.375	-3.532	2.396	1.316
Significance	0.021	0.041	0.102	0.009	0	0.001	0.023	0.198
VIF	9.751	7.009	6.603	4.167	5.281	2.769	2.042	2.967

R-Squared	66.50%
Adjusted R-Squared	57.50%
Regression Sig.	0.00%

DEBT TO EBITDA RATIO (DEBITDA) FINANCIAL COVENANT – 2006-2015 – JONES MODEL ANALYSIS

Debt to EBITDA (Debitda-2015) Ratio Covenant - Jones Model - Descriptives - Table 4.3.1a

		CovThres	DEbitdaComp	ϬCFO	ϬTA	AQJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.315	4.919	1.635	0.162	0.252	0.093	617,652	118.063	6.397	0.479	1.888	0.217	196.667	1.75
Median		3.25	3.342	0.042	0.056	0.224	0.016	466,197	92.196	6.163	0.422	1.643	0	200	2
Std. Deviation		1.183	9.777	8.593	0.459	0.269	0.138	585,586	130.754	1.291	0.305	2.294	0.415	25.82	0.773
Skewness		0.639	4.565	5.334	5.066	0.873	2.296	3	5.049	2.849	1.988	-1.996	1.411	-7.746	0.698
Std. Error of Skewness		0.309	0.309	0.309	0.309	0.309	0.309	0	0.309	0.309	0.309	0.309	0.309	0.309	0.309
Kurtosis		0.204	33.391	27.359	25.323	-0.037	6.8	14	32.086	15.364	6.057	14.57	-0.011	60	-0.219
Std. Error of Kurtosis		0.608	0.608	0.608	0.608	0.608	0.608	1	0.608	0.608	0.608	0.608	0.608	0.608	0.608
Minimum		1.25	-24.146	0.009	0.008	0	0	12,599	5.355	4.314	0	-10.372	0	0	1
Maximum		6.5	69.174	47.521	2.573	0.926	0.701	3,747,123	976.992	13.569	1.705	8.759	1	200	4
Percentiles	25	2.5	1.975	0.03	0.032	0	0	324,154	58.457	5.835	0.321	1.301	0	200	1
	50	3.25	3.342	0.042	0.056	0.224	0.016	466,197	92.196	6.163	0.422	1.643	0	200	2
	75	4	5.198	0.065	0.106	0.4	0.153	756,562	146.827	6.951	0.586	2.653	0	200	2

Debt to EBITDA (Debitda-2015) Ratio Covenant - Tests of Normality - Jones Model - Table 4.3.1b

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.117	60	0.041	0.961	60	0.052
DEbitdaComp	0.291	60	0	0.461	60	0
ΔCFO	0.533	60	0	0.178	60	0
ΔTA	0.403	60	0	0.287	60	0
AQJones	0.22	60	0	0.851	60	0
DEAAQ	0.25	60	0	0.709	60	0
LAmount	0.243	60	0	0.693	60	0
OpCycle	0.205	60	0	0.537	60	0
FirmSize	0.114	60	0.053	0.78	60	0
Leverage	0.169	60	0	0.836	60	0
Growth	0.24	60	0	0.71	60	0
Recession	0.482	60	0	0.508	60	0
Interest	0.535	60	0	0.11	60	0
CovNum	0.267	60	0	0.8	60	0

DEbitda (2015) - Stage 1 of Two Stage Least Squares - Jones Model

Dependent Variable	**CovThres**

	DEbitdaComp	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	-0.004	1.11	-1.192	1.495	0	0.001	-0.094	0.144	-0.102	-0.49	0
T Values	-0.235	3.339	-1.402	0.88	0.825	0.624	-0.563	0.271	-1.458	-1.324	1.096
Significance	0.815	0.002	0.167	0.383	0.414	0.536	0.576	0.787	0.151	0.192	0.279
VIF	1.106	1.169	2.624	2.746	1.534	2.425	2.324	1.32	1.286	1.184	1.362

R-Squared	31.60%
Adjusted R-Squared	15.90%
Regression Sig.	4.70%
Breusch-Pagan Test	30.40%

Dependent Variable	**Interest**

	DEbitdaComp	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	0.068	-7.388	-18.349	1.199	0	0.02	-0.749	-9.755	8.281	-5.575	0
T Values	0.275	-1.362	-1.323	0.043	1.257	0.728	-0.275	-1.123	7.267	-0.923	-3.241
Significance	0.785	0.18	0.192	0.966	0.215	0.47	0.784	0.267	0	0.361	0.002
VIF	1.106	1.169	2.624	2.746	1.534	2.425	2.324	1.32	1.286	1.184	1.362

R-Squared	61.70%
Adjusted R-Squared	53.00%
Regression Sig.	0.00%

Dependent Variable	**CovNum**

	DEbitdaComp	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	0.01	-0.33	-0.34	-0.261	0	0.001	-0.214	0.294	0.036	0.505	0
T Values	0.93	-1.428	-0.574	-0.22	0.004	1.209	-1.84	0.793	0.746	1.959	-0.577
Significance	0.357	0.16	0.568	0.827	0.997	0.233	0.072	0.432	0.459	0.056	0.567
VIF	1.106	1.169	2.624	2.746	1.534	2.425	2.324	1.32	1.286	1.184	1.362

R-Squared	22.30%
Adjusted R-Squared	4.50%
Regression Sig.	28.20%

DEbitda (2015) - Stage 2 of Two Stage Least Squares - Jones Model

Table 4.3.1c

Dependent Variable	**CovThres**

	Inthat	**CovNumhat**	**DEbitdaComp**	**ΔTA**	**AQJones**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**
Beta Values	-0.008	-1.089	0.007	0.67	-1.777	1.335	0	0.003	-0.327	0.34
T Values	-1.063	-1.545	0.449	1.661	-2.153	0.796	1.146	1.613	-1.529	0.592
Significance	0.293	0.129	0.656	0.103	0.036	0.43	0.257	0.113	0.133	0.557
VIF	1.236	3.378	1.356	1.753	2.52	2.726	1.403	2.558	3.897	1.57

R-Squared	31.50%
Adjusted R-Squared	17.50%
Regression Sig.	2.90%
Breusch-Pagan Test	30.70%

Pearson Correlations

	CovThres	Inthat	CovNumhat	DEbitdaComp	ϬTA	AQJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage
CovThres	1.000	-.089	-.207	-.042	.428	-.172	.165	.154	.021	-.056	-.026
Inthat		1.000	-.015	.003	.035	-.220	-.196	.083	-.002	.024	-.333
CovNumhat			1.000	.265	-.455	-.232	.165	-.081	-.008	-.331	.267
DEbitdaComp				1.000	-.048	.088	.183	-.150	.158	.078	.091
ϬTA					1.000	-.124	-.046	.085	-.137	-.091	-.211
AQJones						1.000	.342	.172	-.103	-.077	.157
DEAAQ							1.000	.014	-.028	-.083	.243
LAmount								1.000	-.226	-.294	.083
OpCycle									1.000	.727	.064
FirmSize										1.000	.064
Leverage											1.000

Dependent Variable	**Interest**

Table 4.3.1d

	DEbitdahat	CovNumhat	DEbitdaComp	ϬTA	AQJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	SIC2
Beta Values	-130.436	-137.601	0.956	91.91	-220.551	160.272	0	0.352	-42.417	49.5	0
T Values	-7.697	-6.29	3.206	6.416	-7.741	4.958	6.404	6.43	-6.175	3.623	1.887
Significance	0	0	0.002	0	0	0	0	0	0	0.001	0.065
VIF	23.905	11.98	1.599	8.149	11.064	3.73	2.314	9.628	14.788	3.267	1.729

R-Squared	61.70%
Adjusted R-Squared	53.00%
Regression Sig.	0.00%

Dependent Variable	**CovNum**

Table 4.3.1e

	DEbitdahat	Inthat	DEbitdaComp	ϬTA	AQJones	DEAAQ	LAmount	OpCycle	Leverage	SIC2
Beta Values	-0.432	-0.004	0.011	0.068	-0.908	0.114	0	0	0.244	0
T Values	-0.97	-0.618	0.971	0.126	-1	0.077	0.666	-0.038	0.602	-0.246
Significance	0.337	0.539	0.336	0.9	0.322	0.939	0.509	0.97	0.55	0.807
VIF	8.298	1.892	1.106	5.791	5.629	3.939	2.644	1.455	1.441	1.486

R-Squared	13.00%
Adjusted R-Squared	0.00%
Regression Sig.	68.80%

DEBT TO EBITDA RATIO (DEBITDA) FINANCIAL COVENANT – 2006-2015 – MODIFIED JONES MODEL ANALYSIS

Debt to EBITDA (Debitda-2015) Ratio Covenant - Modified Jones Model - Descriptives - Table 4.3.2a

		CovThres	DEbitdaComp	ϬCFO	ϬTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.315	4.919	1.635	0.162	0.256	0.094	617,652	118.063	6.397	0.479	1.888	0.217	196.667	1.75
Median		3.25	3.342	0.042	0.056	0.177	0.009	466,197	92.196	6.163	0.422	1.643	0	200	2
Std. Deviation		1.183	9.777	8.593	0.459	0.297	0.149	585,586	130.754	1.291	0.305	2.294	0.415	25.82	0.773
Skewness		0.639	4.565	5.334	5.066	0.79	2.041	3	5.049	2.849	1.988	-1.996	1.411	-7.746	0.698
Std. Error of Skewness		0.309	0.309	0.309	0.309	0.309	0.309	0	0.309	0.309	0.309	0.309	0.309	0.309	0.309
Kurtosis		0.204	33.391	27.359	25.323	-0.654	4.564	14	32.086	15.364	6.057	14.57	-0.011	60	-0.219
Std. Error of Kurtosis		0.608	0.608	0.608	0.608	0.608	0.608	1	0.608	0.608	0.608	0.608	0.608	0.608	0.608
Minimum		1.25	-24.146	0.009	0.008	0	0	12,599	5.355	4.314	0	-10.372	0	0	1
Maximum		6.5	69.174	47.521	2.573	0.932	0.699	3,747,123	976.992	13.569	1.705	8.759	1	200	4
Percentiles	25	2.5	1.975	0.03	0.032	0	0	324,154	58.457	5.835	0.321	1.301	0	200	1
	50	3.25	3.342	0.042	0.056	0.177	0.009	466,197	92.196	6.163	0.422	1.643	0	200	2
	75	4	5.198	0.065	0.106	0.463	0.142	756,562	146.827	6.951	0.586	2.653	0	200	2

Debt to EBITDA (Debitda-2015) Ratio Covenant - Tests of Normality - Modified Jones Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.117	60	0.041	0.961	60	0.052
DEbitdaComp	0.291	60	0	0.461	60	0
ϬCFO	0.533	60	0	0.178	60	0
ϬTA	0.403	60	0	0.287	60	0
AQModJones	0.273	60	0	0.816	60	0
DEAAQ	0.264	60	0	0.694	60	0
LAmount	0.243	60	0	0.693	60	0
OpCycle	0.205	60	0	0.537	60	0
FirmSize	0.114	60	0.053	0.78	60	0

Leverage	0.169	60	0	0.836	60	0
Growth	0.24	60	0	0.71	60	0
Recession	0.482	60	0	0.508	60	0
Interest	0.535	60	0	0.11	60	0
CovNum	0.267	60	0	0.8	60	0

DEbitda (2015) - Stage 1 of Two Stage Least Squares - Modified Jones

Dependent Variable **CovThres**

	DEbitdaComp	ϭTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	-0.004	1.136	-0.887	1.343	0	0.001	-0.114	0.127	-0.104	-0.516	0
T Values	-0.234	3.41	-1.204	0.887	0.676	0.651	-0.676	0.237	-1.479	-1.405	1.325
Significance	0.816	0.001	0.234	0.379	0.503	0.518	0.502	0.814	0.146	0.166	0.192
VIF	1.091	1.161	2.369	2.529	1.456	2.451	2.334	1.315	1.3	1.155	1.281

R-Squared	30.80%
Adjusted R-Squared	14.70%
Regression Sig.	5.07%
Breusch-Pagan Test	25.70%

Dependent Variable **Interest**

	DEbitdaComp	ϭTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.069	-6.916	-10.989	-7.355	0	0.018	-0.989	-9.4	8.323	-5.742	0
T Values	0.279	-1.266	-0.909	-0.296	0.941	0.658	-0.359	-1.073	7.19	-0.953	-3.163
Significance	0.782	0.212	0.368	0.768	0.352	0.513	0.721	0.289	0	0.346	0.003
VIF	1.091	1.161	2.369	2.529	1.456	2.451	2.334	1.315	1.3	1.155	1.281

R-Squared	60.90%
Adjusted R-Squared	52.00%
Regression Sig.	0.00%

Dependent Variable **CovNum**

	DEbitdaComp	ϭTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.011	-0.342	-0.358	-0.619	0	0.001	-0.216	0.331	0.037	0.485	0
T Values	1.044	-1.513	-0.716	-0.601	-0.187	1.065	-1.895	0.912	0.778	1.941	-0.61
Significance	0.302	0.137	0.478	0.55	0.853	0.292	0.064	0.366	0.44	0.058	0.544
VIF	1.091	1.161	2.369	2.529	1.456	2.451	2.334	1.315	1.3	1.155	1.281

R-Squared	25.10%
Adjusted R-Squared	8.00%
Regression Sig.	17.60%

DEbitda (2015) - Stage 2 of Two Stage Least Squares - Modified Jones Model

Table 4.3.2b

Dependent Variable **CovThres**

	Inthat	CovNumhat	DEbitdaComp	ϭTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage
Beta Values	-0.008	-1.229	0.01	0.626	-1.483	0.627	0	0.003	-0.379	0.384
T Values	-1.043	-1.702	0.591	1.509	-1.936	0.396	0.792	1.623	-1.726	0.65
Significance	0.302	0.095	0.557	0.138	0.059	0.694	0.432	0.111	0.091	0.519
VIF	1.229	3.944	1.376	1.827	2.602	2.816	1.441	2.505	4.042	1.637

R-Squared	30.50%
Adjusted R-Squared	16.30%
Regression Sig.	3.80%
Breusch-Pagan Test	27.00%

Pearson Correlations

	CovThres	Inthat	CovNumhat	DEbitdaComp	ϭTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage
CovThres	1.000	-.116	-.199	-.042	.428	-.138	.167	.154	-.056	-.026	.105
Inthat		1.000	-.010	.003	.035	-.202	-.190	.083	.024	-.334	-.044
CovNumhat			1.000	.252	-.434	-.336	.139	-.077	-.316	.255	-.140
DEbitdaComp				1.000	-.048	.087	.178	-.150	.078	.091	-.068
ϭTA					1.000	-.113	-.037	.085	-.091	-.211	-.140
AQModJones						1.000	.289	.100	-.151	.116	-.109
DEAAQ							1.000	-.041	-.058	.268	-.004
LAmount								1.000	-.294	.083	.215
OpCycle									1.000	.064	.103
FirmSize										1.000	-.166
Leverage											1.000

Table 4.3.2c

Dependent Variable	Interest

	DEbitdahat	CovNumhat	DEbitdaComp	ϬTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	SIC2
Beta Values	-135.668	-156.395	1.272	93.683	-187.444	78.119	0	0.361	-50.274	59.528	0
T Values	-7.649	-6.412	3.953	6.416	-7.401	2.908	4.852	6.449	-6.428	4.01	3.12
Significance	0	0	0	0	0	0.005	0	0	0	0	0.003
VIF	24.975	16.462	1.822	8.291	10.402	2.959	1.749	9.882	18.772	3.777	1.941

R-Squared	60.90%
Adjusted R-Squared	52.00%
Regression Sig.	0.00%

Table 4.3.2d

Dependent Variable	CovNum

	DEbitdahat	Inthat	DEbitdaComp	ϬTA	AQModJones	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	SIC2
Beta Values	-0.867	-0.006	0.008	0.599	-1.199	0.5	0	0.002	-0.321	0.381	0
T Values	-1.97	-0.99	0.782	1.089	-1.817	0.416	0.68	1.672	-2.476	0.998	0.522
Significance	0.055	0.327	0.438	0.282	0.075	0.679	0.5	0.101	0.017	0.323	0.604
VIF	8.971	1.82	1.109	6.853	4.11	3.441	2.121	3.502	3.014	1.453	1.651

R-Squared	25.10%
Adjusted R-Squared	8.00%
Regression Sig.	17.60%

DEBT TO EBITDA RATIO (DEBITDA) FINANCIAL COVENANT – 2006-2015 – PEASNELL MODEL ANALYSIS

Debt to EBITDA (Debitda-2015) Ratio Covenant - Peasnell Model - Descriptives - Table 4.3.3a

		CovThres	DEbitdaComp	ϬCFO	ϬWCA	AQPeasnell	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.315	4.919	1.635	0.077	0.27	0.093	617,652	118.063	6.397	0.479	1.888	0.217	196.667	1.75
Median		3.25	3.342	0.042	0.054	0.125	0.039	466,197	92.196	6.163	0.422	1.643	0	200	2
Std. Deviation		1.183	9.777	8.593	0.074	0.309	0.143	585,586	130.754	1.291	0.305	2.294	0.415	25.82	0.773
Skewness		0.639	4.565	5.334	2.409	0.918	2.118	3	5.049	2.849	1.988	-1.996	1.411	-7.746	0.698
Std. Error of Skewness		0.309	0.309	0.309	0.309	0.309	0.309	0	0.309	0.309	0.309	0.309	0.309	0.309	0.309
Kurtosis		0.204	33.391	27.359	7.063	-0.527	4.011	14	32.086	15.364	6.057	14.57	-0.011	60	-0.219
Std. Error of Kurtosis		0.608	0.608	0.608	0.608	0.608	0.608	1	0.608	0.608	0.608	0.608	0.608	0.608	0.608
Minimum		1.25	-24.146	0.009	0.01	0	0	12,599	5.355	4.314	0	-10.372	0	0	1
Maximum		6.5	69.174	47.521	0.409	0.971	0.618	3,747,123	976.992	13.569	1.705	8.759	1	200	4
Percentiles	25	2.5	1.975	0.03	0.03	0	0	324,154	58.457	5.835	0.321	1.301	0	200	1
	50	3.25	3.342	0.042	0.054	0.125	0.039	466,197	92.196	6.163	0.422	1.643	0	200	2
	75	4	5.198	0.065	0.092	0.57	0.115	756,562	146.827	6.951	0.586	2.653	0	200	2

Debt to EBITDA (Debitda-2015) Ratio Covenant - Tests of Normality - Peasnell Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.117	60	0.041	0.961	60	0.052
DEbitdaComp	0.291	60	0	0.461	60	0
ϬCFO	0.533	60	0	0.178	60	0
ϬWCA	0.2	60	0	0.742	60	0
AQPeasnell	0.198	60	0	0.818	60	0
DEAAQ	0.257	60	0	0.684	60	0
LAmount	0.243	60	0	0.693	60	0
OpCycle	0.205	60	0	0.537	60	0
FirmSize	0.114	60	0.053	0.78	60	0
Leverage	0.169	60	0	0.836	60	0
Growth	0.24	60	0	0.71	60	0
Recession	0.482	60	0	0.508	60	0
Interest	0.535	60	0	0.11	60	0
CovNum	0.267	60	0	0.8	60	0

DEbitda (2015) - Stage 1 of Two Stage Least Squares - Peasnell Model

Dependent Variable	CovThres

	DEbitdaComp	ϬWCA	AQPeasnell	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	-0.004	-1.44	-0.122	-0.926	0	0	-0.062	-0.442	-0.101	-0.701	0
T Values	-0.243	-0.553	-0.145	-0.484	0.816	0.158	-0.299	-0.715	-1.262	-1.706	0.731

R-Squared	12.30%
Adjusted R-Squared	0.00%
Regression Sig.	80.80%

Significance	0.809	0.583	0.886	0.631	0.419	0.875	0.766	0.478	0.213	0.095	0.468
VIF	1.077	1.44	2.68	2.911	1.425	2.661	2.836	1.391	1.319	1.142	1.26

Breusch-Pagan Test	11.20%

Dependent Variable	Interest										
	DEbitdaComp	**ΘWCA**	**AQPeasnell**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	0.025	-14.357	-3.635	3.892	0	0.031	-1.629	-10.233	8.333	-3.976	0
T Values	0.096	-0.365	-0.284	0.135	0.833	1.032	-0.517	-1.096	6.891	-0.64	-2.801
Significance	0.924	0.717	0.778	0.893	0.409	0.307	0.608	0.279	0	0.525	0.007
VIF	1.077	1.44	2.68	2.911	1.425	2.661	2.836	1.391	1.319	1.142	1.26

R-Squared	58.00%
Adjusted R-Squared	48.30%
Regression Sig.	0.00%

Dependent Variable	CovNum										
	DEbitdaComp	**ΘWCA**	**AQPeasnell**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**Growth**	**Recession**	**SIC2**
Beta Values	0.008	-2.573	0.317	-0.069	0	0.002	-0.276	0.145	0.028	0.603	0
T Values	0.72	-1.608	0.61	-0.058	0.275	1.74	-2.15	0.38	0.568	2.385	-0.513
Significance	0.475	0.115	0.545	0.954	0.784	0.088	0.037	0.705	0.573	0.021	0.61
VIF	1.077	1.44	2.68	2.911	1.425	2.661	2.836	1.391	1.319	1.142	1.26

R-Squared	22.40%
Adjusted R-Squared	4.60%
Regression Sig.	27.70%

DEbitda (2015) - Stage 2 of Two Stage Least Squares - Peasnell Model

Table 4.3.3b

Dependent Variable	CovThres									
	Inthat	**CovNumhat**	**DEbitdaComp**	**ΘWCA**	**AQPeasnell**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**
Beta Values	-0.008	-1.217	0.005	-4.69	0.234	-0.977	0	0.003	-0.411	-0.35
T Values	-0.909	-1.818	0.3	-1.568	0.272	-0.517	1.185	1.48	-1.566	-0.559
Significance	0.368	0.075	0.765	0.123	0.787	0.607	0.242	0.145	0.124	0.579
VIF	1.211	2.393	1.152	1.94	2.836	2.899	1.311	3.122	4.585	1.454

R-Squared	12.30%
Adjusted R-Squared	0.00%
Regression Sig.	72.90%
Breusch-Pagan Test	25.20%

Peasnell Correlations

	CovThres	**Inthat**	**CovNumhat**	**DEbitdaComp**	**ΘWCA**	**AQPeasnell**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**
CovThres	1.000	-.059	-.122	-.042	-.014	-.105	-.095	.154	.021	-.056	-.026
Inthat		1.000	-.115	.003	.021	.031	-.010	.086	-.002	.024	-.344
CovNumhat			1.000	.268	-.328	.088	-.155	-.082	-.008	-.335	.270
DEbitdaComp				1.000	-.067	.036	-.080	-.150	.158	.078	.091
ΘWCA					1.000	.158	.161	.260	-.093	-.280	-.328
AQPeasnell						1.000	.757	-.056	-.041	-.033	-.162
DEAAQ							1.000	.058	-.077	.074	-.181
LAmount								1.000	-.226	-.294	.083
OpCycle									1.000	.727	.064
FirmSize										1.000	.064
Leverage											1.000

Table 4.3.3c

Dependent Variable	Interest										
	DEbitdahat	**CovNumhat**	**DEbitdaComp**	**ΘWCA**	**AQPeasnell**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**SIC2**
Beta Values	-124.329	-151.242	0.649	-582.418	29.119	-121.593	0	0.393	-51.101	-43.317	0
T Values	-7.259	-6.753	2.361	-6.803	2.186	-3.845	6.494	6.288	-6.282	-4.678	0.056
Significance	0	0	0.022	0	0.034	0	0	0	0	0	0.956
VIF	8.672	11.487	1.236	6.821	2.906	3.483	2.884	11.442	18.881	1.367	1.269

R-Squared	58.00%
Adjusted R-Squared	48.30%
Regression Sig.	0.00%

Table 4.3.3d

Dependent Variable	CovNum										
	DEbitdahat	**Inthat**	**DEbitdaComp**	**ΘWCA**	**AQPeasnell**	**DEAAQ**	**LAmount**	**OpCycle**	**FirmSize**	**Leverage**	**SIC2**
Beta Values	-0.822	-0.007	0.004	-3.851	0.193	-0.804	0	0.003	-0.338	-0.286	0
T Values	-2.375	-1.098	0.409	-2.254	0.37	-0.678	1.251	2.058	-2.556	-0.661	0.009
Significance	0.022	0.278	0.684	0.029	0.713	0.501	0.217	0.045	0.014	0.512	0.993

R-Squared	22.40%
Adjusted R-Squared	4.60%
Regression Sig.	27.70%

VIF	2.141	1.451	1.085	1.642	2.686	2.96	2.051	2.822	3.011	1.809	1.267

DEBT TO EBITDA RATIO (DEBITDA) FINANCIAL COVENANT – 2006-2015 – DECHOW AND DICHEV (DD) MODEL ANALYSIS

Debt to EBITDA (Debitda-2015) Ratio Covenant - Dechow and Dichev (DD) Model - Descriptives - Table 4.3.4a

		CovThres	DEbitdaComp	ΘCFO	ΘWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.315	4.919	1.635	0.086	0.246	0.07	617,652	118.063	6.397	0.479	1.888	0.217	196.667	1.75
Median		3.25	3.342	0.042	0.051	0.155	0.024	466,197	92.196	6.163	0.422	1.643	0	200	2
Std. Deviation		1.183	9.777	8.593	0.129	0.285	0.107	585,586	130.754	1.291	0.305	2.294	0.415	25.82	0.773
Skewness		0.639	4.565	5.334	3.798	1.01	1.965	3	5.049	2.849	1.988	-1.996	1.411	-7.746	0.698
Std. Error of Skewness		0.309	0.309	0.309	0.309	0.309	0.309	0	0.309	0.309	0.309	0.309	0.309	0.309	0.309
Kurtosis		0.204	33.391	27.359	15.072	-0.171	3.542	14	32.086	15.364	6.057	14.57	-0.011	60	-0.219
Std. Error of Kurtosis		0.608	0.608	0.608	0.608	0.608	0.608	1	0.608	0.608	0.608	0.608	0.608	0.608	0.608
Minimum		1.25	-24.146	0.009	0.005	0	0	12,599	5.355	4.314	0	-10.372	0	0	1
Maximum		6.5	69.174	47.521	0.682	0.919	0.435	3,747,123	976.992	13.569	1.705	8.759	1	200	4
Percentiles	25	2.5	1.975	0.03	0.028	0	0	324,154	58.457	5.835	0.321	1.301	0	200	1
	50	3.25	3.342	0.042	0.051	0.155	0.024	466,197	92.196	6.163	0.422	1.643	0	200	2
	75	4	5.198	0.065	0.087	0.416	0.109	756,562	146.827	6.951	0.586	2.653	0	200	2

Debt to EBITDA (Debitda-2015) Ratio Covenant - Tests of Normality - DD Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.117	60	0.041	0.961	60	0.052
DEbitdaComp	0.291	60	0	0.461	60	0
ΘCFO	0.533	60	0	0.178	60	0
ΘWC	0.269	60	0	0.503	60	0
AQDD	0.194	60	0	0.822	60	0
DEAAQ	0.255	60	0	0.706	60	0
LAmount	0.243	60	0	0.693	60	0
OpCycle	0.205	60	0	0.537	60	0
FirmSize	0.114	60	0.053	0.78	60	0
Leverage	0.169	60	0	0.836	60	0
Growth	0.24	60	0	0.71	60	0
Recession	0.482	60	0	0.508	60	0
Interest	0.535	60	0	0.11	60	0
CovNum	0.267	60	0	0.8	60	0

DEbitda (2015) - Stage 1 of Two Stage Least Squares - DD Model

Dependent Variable	CovThres										
	DEbitdaComp	ΘWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.002	3.355	0.942	-1.652	0	0.001	-0.113	0.381	-0.087	-0.416	0
T Values	0.116	2.481	1.179	-0.787	0.469	0.633	-0.665	0.705	-1.214	-1.109	1.463
Significance	0.908	0.017	0.244	0.435	0.641	0.53	0.509	0.484	0.231	0.273	0.15
VIF	1.126	1.471	2.51	2.423	1.303	2.402	2.335	1.309	1.296	1.172	1.339

R-Squared	28.90%
Adjusted R-Squared	12.60%
Regression Sig.	8.60%
Breusch-Pagan Test	21.90%

Dependent Variable	Interest										
	DEbitdaComp	ΘWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2

R-Squared	60.00%

Beta Values	0.052	-22.574	-0.984	-24.773	0	0.024	-0.889	-10.302	8.168	-5.362	0
T Values	0.203	-1.019	-0.075	-0.72	1.027	0.867	-0.318	-1.165	6.98	-0.872	-2.677
Significance	0.84	0.313	0.94	0.475	0.309	0.39	0.751	0.25	0	0.387	0.01
VIF	1.126	1.471	2.51	2.423	1.303	2.402	2.335	1.309	1.296	1.172	1.339

Adjusted R Squared	50.80%
Regression Sig.	0.00%

Dependent Variable	CovNum										
	DEbitdaComp	ΘWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.007	-1.638	0.527	-0.229	0	0.002	-0.235	0.178	0.036	0.573	0
T Values	0.632	-1.789	0.975	-0.161	-0.033	1.65	-2.039	0.486	0.741	2.255	-0.54
Significance	0.531	0.08	0.335	0.873	0.974	0.106	0.047	0.629	0.463	0.029	0.591
VIF	1.126	1.471	2.51	2.423	1.303	2.402	2.335	1.309	1.296	1.172	1.339

R-Squared	23.60%
Adjusted R-Squared	6.10%
Regression Sig.	22.80%

DEbitda (2015) - Stage 2 of Two Stage Least Squares - DD Model

Table 4.3.3b

Dependent Variable	CovThres									
	Inthat	CovNumhat	DEbitdaComp	ΘWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	Growth
Beta Values	-0.027	-0.894	0.01	1.151	1.388	-2.466	0	0.003	-0.341	0.159
T Values	-1.289	-1.43	0.608	0.646	1.681	-1.074	1.016	1.786	-1.557	0.896
Significance	0.203	0.159	0.546	0.521	0.099	0.288	0.315	0.08	0.126	0.375
VIF	8.765	2.701	1.232	2.591	2.717	2.94	1.244	3.11	3.919	8.122

R-Squared	28.50%
Adjusted R-Squared	13.90%
Regression Sig.	6.00%
Breusch-Pagan Test	39.80%

Pearson Correlations

	CovThres	Inthat	CovNumhat	DEbitdaComp	ΘWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	Growth
CovThres	1.000	-.186	-.238	-.042	.422	.264	.202	.154	.021	-.056	-.075
Inthat		1.000	-.128	.003	.010	-.098	-.304	.081	-.002	.023	.868
CovNumhat			1.000	.259	-.542	.012	.032	-.079	-.008	-.324	-.116
DEbitdaComp				1.000	-.104	.010	.177	-.150	.158	.078	-.030
ΘWC					1.000	.343	.029	.083	-.079	-.056	.060
AQDD						1.000	-.056	.034	-.117	-.029	.034
DEAAQ							1.000	.009	.020	.076	.093
LAmount								1.000	-.226	-.294	.077
OpCycle									1.000	.727	-.068
FirmSize										1.000	.043
Growth											1.000

Table 4.3.3c

Dependent Variable	Interest									
	DEbitdahat	CovNumhat	DEbitdaComp	ΘWC	AQDD	DEAAQ	LAmount	OpCycle	FirmSize	SIC2
Beta Values	-75.205	-56.017	0.642	123.707	101.441	-161.846	0	0.203	-20.744	0
T Values	-5.762	-3.742	2.047	2.9	4.735	-3.93	3.184	4.114	-3.806	2.341
Significance	0	0	0.046	0.006	0	0	0.003	0	0	0.023
VIF	9.146	4.197	1.248	4.027	4.962	2.564	1.465	5.515	6.565	1.514

R-Squared	44.60%
Adjusted R-Squared	33.30%
Regression Sig.	0.01%

Table 4.3.3d

Dependent Variable	CovNum								
	DEbitdahat	Inthat	DEbitdaComp	ΘWC	AQDD	DEAAQ	LAmount	FirmSize	SIC2
Beta Values	-0.302	-0.004	0.009	-0.836	0.523	-0.392	0	-0.112	0
T Values	-0.735	-0.568	0.83	-0.524	0.79	-0.24	0.09	-1.336	-0.035
Significance	0.466	0.573	0.41	0.602	0.433	0.811	0.929	0.188	0.972
VIF	6.645	1.645	1.156	4.116	3.476	2.958	1.601	1.143	1.574

R-Squared	13.90%
Adjusted R-Squared	0.00%
Regression Sig.	53.30%

DEBT TO EBITDA RATIO (DEBITDA) FINANCIAL COVENANT – 2006-2015 – MCNICHOLS MODEL ANALYSIS

Debt to EBITDA (Debitda-2015) Ratio Covenant - McNichols Model - Descriptives - Table 4.3.5a

		CovThres	DEbitdaComp	ϬCFO	ϬWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.315	4.919	1.635	0.086	0.505	0.172	617,652	118.063	6.397	0.479	1.888	0.217	196.667	1.75
Median		3.25	3.342	0.042	0.051	0.587	0.106	466,197	92.196	6.163	0.422	1.643	0	200	2
Std. Deviation		1.183	9.777	8.593	0.129	0.381	0.202	585,586	130.754	1.291	0.305	2.294	0.415	25.82	0.773
Skewness		0.639	4.565	5.334	3.798	-0.194	1.094	3	5.049	2.849	1.988	-1.996	1.411	-7.746	0.698
Std. Error of Skewness		0.309	0.309	0.309	0.309	0.309	0.309	0	0.309	0.309	0.309	0.309	0.309	0.309	0.309
Kurtosis		0.204	33.391	27.359	15.072	-1.552	0.113	14	32.086	15.364	6.057	14.57	-0.011	60	-0.219
Std. Error of Kurtosis		0.608	0.608	0.608	0.608	0.608	0.608	1	0.608	0.608	0.608	0.608	0.608	0.608	0.608
Minimum		1.25	-24.146	0.009	0.005	0	0	12,599	5.355	4.314	0	-10.372	0	0	1
Maximum		6.5	69.174	47.521	0.682	1	0.706	3,747,123	976.992	13.569	1.705	8.759	1	200	4
Percentiles	25	2.5	1.975	0.03	0.028	0.008	0	324,154	58.457	5.835	0.321	1.301	0	200	1
	50	3.25	3.342	0.042	0.051	0.587	0.106	466,197	92.196	6.163	0.422	1.643	0	200	2
	75	4	5.198	0.065	0.087	0.893	0.283	756,562	146.827	6.951	0.586	2.653	0	200	2

Debt to EBITDA (Debitda-2015) Ratio Covenant - Tests of Normality - McNichols Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.117	60	0.041	0.961	60	0.052
DEbitdaComp	0.291	60	0	0.461	60	0
ϬCFO	0.533	60	0	0.178	60	0
ϬWC	0.269	60	0	0.503	60	0
AQMcNichols	0.17	60	0	0.861	60	0
DEAAQ	0.196	60	0	0.822	60	0
LAmount	0.243	60	0	0.693	60	0
OpCycle	0.205	60	0	0.537	60	0
FirmSize	0.114	60	0.053	0.78	60	0
Leverage	0.169	60	0	0.836	60	0
Growth	0.24	60	0	0.71	60	0
Recession	0.482	60	0	0.508	60	0
Interest	0.535	60	0	0.11	60	0
CovNum	0.267	60	0	0.8	60	0

DEbitda (2015) - Stage 1 of Two Stage Least Squares - McNichols Model

Dependent Variable	CovThres										
	DEbitdaComp	ϬWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.004	4.095	-0.137	-0.664	0	0	-0.046	0.3	-0.08	-0.549	0
T Values	0.247	3.078	-0.232	-0.603	0.383	0.139	-0.262	0.558	-1.127	-1.431	1.577
Significance	0.806	0.003	0.817	0.549	0.704	0.89	0.795	0.579	0.265	0.159	0.121
VIF	1.136	1.415	2.4	2.361	1.331	2.587	2.494	1.289	1.277	1.217	1.348

R-Squared	28.50%
Adjusted R-Squared	12.10%
Regression Sig.	9.30%
Breusch-Pagan Test	27.30%

Dependent Variable	Interest										
	DEbitdaComp	ϬWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2

R-Squared	59.80%

Beta Values	0.043	-31.907	8.02	-18.933	0	0.029	-0.869	-12.896	8.318	-4.219	0
T Values	0.168	-1.467	0.835	-1.052	1.159	0.982	-0.301	-1.467	7.151	-0.673	-2.673
Significance	0.867	0.149	0.408	0.298	0.252	0.331	0.765	0.149	0	0.504	0.01
VIF	1.136	1.415	2.4	2.361	1.331	2.587	2.494	1.289	1.277	1.217	1.348

Adjusted R Squared	50.60%
Regression Sig.	0.00%

Dependent Variable **CovNum**

	DEbitdaComp	ƓWC	AQMcNichols	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.006	-0.969	-0.235	0.615	0	0.002	-0.23	0.227	0.034	0.509	0
T Values	0.514	-1.069	-0.587	0.82	-0.249	1.347	-1.91	0.619	0.699	1.949	-0.687
Significance	0.61	0.291	0.56	0.416	0.804	0.184	0.062	0.539	0.488	0.057	0.495
VIF	1.136	1.415	2.4	2.361	1.331	2.587	2.494	1.289	1.277	1.217	1.348

R-Squared	22.20%
Adjusted R-Squared	4.40%
Regression Sig.	28.50%

DEbitda (2015) - Stage 2 of Two Stage Least Squares - McNichols Model

Table 4.3.5b

Dependent Variable **CovThres**

	Inthat	CovNumhat	DEbitdaComp	ƓWC	AQMcNichols	DEAAQ	OpCycle	FirmSize	Leverage
Beta Values	-0.005	-1.38	0.009	2.554	-0.525	0.422	0.003	-0.372	0.488
T Values	-0.681	-2.055	0.579	1.708	-0.862	0.394	1.466	-1.795	0.893
Significance	0.499	0.045	0.565	0.094	0.393	0.695	0.149	0.079	0.376
VIF	1.18	2.936	1.196	1.832	2.643	2.293	2.696	3.512	1.363

R-Squared	27.20%
Adjusted R-Squared	14.20%
Regression Sig.	4.90%
Breusch-Pagan Test	60.80%

Pearson Correlations

	CovThres	Inthat	CovNumhat	DEbitdaComp	ƓWC	AQMcNichols	DEAAQ	OpCycle	FirmSize	Leverage
CovThres	1.000	-.138	-.314	-.042	.422	.032	.193	.154	-.056	-.026
Inthat		1.000	-.069	.003	.010	.116	-.084	.084	.024	-.340
CovNumhat			1.000	.276	-.576	-.390	-.022	-.084	-.345	.278
DEbitdaComp				1.000	-.104	.082	.151	-.150	.078	.091
ƓWC					1.000	.269	.007	.083	-.056	-.274
AQMcNichols						1.000	.110	-.006	.067	-.096
DEAAQ							1.000	.111	-.040	-.085
OpCycle								1.000	-.294	.083
FirmSize									1.000	.064
Leverage										1.000

Dependent Variable **Interest**

Table 4.3.5c

	DEbitdahat	CovNumhat	DEbitdaComp	ƓWC	AQMcNichols	DEAAQ	OpCycle	Leverage	FirmSize	SIC2
Beta Values	-179.263	-211.036	1.793	509.835	-71.248	2.671	0.406	92.733	-59.146	0
T Values	-6.365	-5.976	4.481	5.719	-4.162	0.126	5.698	4.45	-5.855	4.832
Significance	0	0	0	0	0	0.9	0	0	0	0
VIF	47.039	24.603	2.275	19.712	6.328	2.709	12.908	6.009	25.275	4.315

R-Squared	50.60%
Adjusted R-Squared	40.50%
Regression Sig.	0.00%

Dependent Variable **CovNum**

Table 4.3.5d

	DEbitdahat	Inthat	DEbitdaComp	ƓWC	AQMcNichols	DEAAQ	OpCycle	Leverage	FirmSize	SIC2
Beta Values	-0.828	-0.004	0.008	2.347	-0.348	0.04	0.002	0.454	-0.278	0
T Values	-2.032	-0.672	0.794	1.212	-0.899	0.051	1.544	1.133	-2.253	0.825
Significance	0.048	0.505	0.431	0.232	0.373	0.959	0.129	0.263	0.029	0.413
VIF	6.957	1.321	1.127	6.585	2.293	2.654	2.715	1.572	2.674	2.225

R-Squared	22.00%
Adjusted R-Squared	6.10%
Regression Sig.	21.60%

DEBT TO EBITDA RATIO (DEBITDA) FINANCIAL COVENANT – 2006-2015 – FRANCIS MODEL ANALYSIS

Debt to EBITDA (Debitda-2015) Ratio Covenant - Francis Model - Descriptives - Table 4.3.6a

		CovThres	DEbitdaComp	ϬCFO	ϬTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	Interest	CovNum
N	Valid	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.315	4.919	1.635	0.061	0.456	0.179	617,652	118.063	6.397	0.479	1.888	0.217	196.667	1.75
Median		3.25	3.342	0.042	0.041	0.523	0.093	466,197	92.196	6.163	0.422	1.643	0	200	2
Std. Deviation		1.183	9.777	8.593	0.054	0.368	0.213	585,586	130.754	1.291	0.305	2.294	0.415	25.82	0.773
Skewness		0.639	4.565	5.334	2.254	-0.088	1.248	3	5.049	2.849	1.988	-1.996	1.411	-7.746	0.698
Std. Error of Skewness		0.309	0.309	0.309	0.309	0.309	0.309	0	0.309	0.309	0.309	0.309	0.309	0.309	0.309
Kurtosis		0.204	33.391	27.359	6.288	-1.604	0.652	14	32.086	15.364	6.057	14.57	-0.011	60	-0.219
Std. Error of Kurtosis		0.608	0.608	0.608	0.608	0.608	0.608	1	0.608	0.608	0.608	0.608	0.608	0.608	0.608
Minimum		1.25	-24.146	0.009	0.01	0	0	12,599	5.355	4.314	0	-10.372	0	0	1
Maximum		6.5	69.174	47.521	0.291	0.981	0.795	3,747,123	976.992	13.569	1.705	8.759	1	200	4
Percentiles	25	2.5	1.975	0.03	0.026	0	0	324,154	58.457	5.835	0.321	1.301	0	200	1
	50	3.25	3.342	0.042	0.041	0.523	0.093	466,197	92.196	6.163	0.422	1.643	0	200	2
	75	4	5.198	0.065	0.083	0.773	0.296	756,562	146.827	6.951	0.586	2.653	0	200	2

Debt to EBITDA (Debitda-2015) Ratio Covenant - Tests of Normality - Francis Model

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CovThres	0.117	60	0.041	0.961	60	0.052
DEbitdaComp	0.291	60	0	0.461	60	0
ϬCFO	0.533	60	0	0.178	60	0
ϬTCA	0.172	60	0	0.772	60	0
AQFrancis	0.192	60	0	0.858	60	0
DEAAQ	0.201	60	0	0.815	60	0
LAmount	0.243	60	0	0.693	60	0
OpCycle	0.205	60	0	0.537	60	0
FirmSize	0.114	60	0.053	0.78	60	0
Leverage	0.169	60	0	0.836	60	0
Growth	0.24	60	0	0.71	60	0
Recession	0.482	60	0	0.508	60	0
Interest	0.535	60	0	0.11	60	0
CovNum	0.267	60	0	0.8	60	0

DEbitda (2015) - Stage 1 of Two Stage Least Squares - Francis Model

Dependent Variable: CovThres

	DEbitdaComp	ϬTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	-0.007	-3.028	0.039	-0.793	0	0.001	-0.126	-0.151	-0.098	-0.798	0
T Values	-0.391	-0.827	0.063	-0.71	0.852	0.319	-0.607	-0.262	-1.245	-1.891	0.5
Significance	0.697	0.412	0.95	0.481	0.398	0.751	0.547	0.795	0.219	0.065	0.619
VIF	1.12	1.529	2.117	2.238	1.487	2.642	2.844	1.216	1.29	1.213	1.25

R-Squared	13.00%
Adjusted R-Squared	0.00%
Regression Sig.	77.60%
Breusch-Pagan Test	33.90%

Dependent Variable: Interest

	DEbitdaComp	ϬTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.067	-31.584	9.351	-5.787	0	0.028	-1.073	-8.859	8.337	-3.627	0
T Values	0.261	-0.577	0.993	-0.347	1.162	0.959	-0.345	-1.029	7.072	-0.575	-2.96
Significance	0.795	0.567	0.325	0.73	0.251	0.343	0.732	0.309	0	0.568	0.005
VIF	1.12	1.529	2.117	2.238	1.487	2.642	2.844	1.216	1.29	1.213	1.25

R-Squared	59.20%
Adjusted R-Squared	49.80%
Regression Sig.	0.00%

Dependent Variable: CovNum

	DEbitdaComp	ϬTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	Growth	Recession	SIC2
Beta Values	0.009	-5.894	-0.073	0.166	0	0.003	-0.348	0.267	0.024	0.502	0
T Values	0.876	-2.72	-0.195	0.251	0.701	2.183	-2.823	0.785	0.508	2.008	-0.756
Significance	0.385	0.009	0.846	0.803	0.487	0.034	0.007	0.436	0.614	0.05	0.454
VIF	1.12	1.529	2.117	2.238	1.487	2.642	2.844	1.216	1.29	1.213	1.25

R-Squared	28.60%
Adjusted R-Squared	12.30%
Regression Sig.	9.10%

DEbitda (2015) - Stage 2 of Two Stage Least Squares - Francis Model

Table 4.3.6b

Dependent Variable	CovThres

	Inthat	CovNumhat	DEbitdaComp	ƕTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage
Beta Values	-0.007	-1.643	0.008	-12.937	-0.014	-0.561	0	0.005	-0.705	0.226
T Values	-0.79	-1.948	0.46	-1.996	-0.022	-0.51	1.583	1.882	-1.98	0.35
Significance	0.433	0.057	0.648	0.052	0.983	0.612	0.12	0.066	0.054	0.728
VIF	1.257	4.797	1.261	4.789	2.152	2.17	1.629	4.823	8.331	1.53

R-Squared	13.00%
Adjusted R-Squared	0.00%
Regression Sig.	77.60%
Breusch-Pagan Test	33.90%

Pearson Correlations

	CovThres	Inthat	CovNumhat	DEbitdaComp	ƕTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage
CovThres	1.000	-.086	.032	-.042	-.010	-.030	.134	.154	.021	-.056	-.026
Inthat		1.000	-.113	.003	-.068	.098	-.064	.084	-.002	.024	-.337
CovNumhat			1.000	.215	-.406	-.020	.479	-.066	-.007	-.270	.218
DEbitdaComp				1.000	-.012	-.171	-.110	-.150	.158	.078	.091
ƕTCA					1.000	.026	-.236	.384	-.102	-.354	.006
AQFrancis						1.000	.027	-.071	-.069	-.163	-.004
DEAAQ							1.000	-.146	.027	.046	-.242
LAmount								1.000	-.226	-.294	.083
OpCycle									1.000	.727	.064
FirmSize										1.000	.064
Leverage											1.000

Table 4.3.6c

Dependent Variable	Interest

	DEbitdahat	CovNumhat	DEbitdaComp	ƕTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize	Leverage	SIC2
Beta Values	-140.732	-231.237	1.184	-1820.72	-1.928	-78.973	0	0.709	-99.257	31.777	0
T Values	-7.44	-7.061	3.928	-7.281	-0.203	-3.973	7.473	7.018	-6.961	2.682	-4.518
Significance	0	0	0	0	0.84	0	0	0	0	0.01	0
VIF	11.466	32.349	1.532	31.9	2.163	3.175	6.478	30.733	59.72	2.304	1.634

R-Squared	59.20%
Adjusted R-Squared	49.80%
Regression Sig.	0.00%

Table 4.3.6d

Dependent Variable	CovNum

	DEbitdahat	Inthat	DEbitdaComp	ƕTCA	AQFrancis	DEAAQ	LAmount	OpCycle	FirmSize
Beta Values	-0.657	-0.005	0.006	-7.841	-0.027	-0.287	0	0.003	-0.436
T Values	-2.253	-1.016	0.577	-3.55	-0.072	-0.442	1.552	2.579	-3.412
Significance	0.029	0.315	0.567	0.001	0.943	0.66	0.127	0.013	0.001
VIF	1.789	1.128	1.115	1.635	2.138	2.225	1.815	2.841	3.151

R-Squared	27.70%
Adjusted R-Squared	14.70%
Regression Sig.	4.40%

References

Akerlof, G. A. 1970. The Market for "Lemons": Quality Uncertainty and the Market Mechanism. The Quarterly Journal of Economics. 84(3). 488-500.

Altman, E. I. 2002. Revisiting Credit Scoring Models in a Basel 2 Environment. Electronic print available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1295815

Amiram, D. Bozanic, Z. Cox, J, D. Dupont, Q. Karpoff, J, M. and Sloan, R, G. 2018. Financial Reporting Fraud and Other Forms of Misconduct: A Multidisciplinary Review of the Literature. Review of Accounting Studies. 23(2). 732-783.

Amiram, D., Kalay, Alon., and Sadka, G. 2017. Industry Characteristics, Risk Premiums, and Debt Pricing. The Accounting Review. 92, 1-27.

Ang, J.S., Chua, J.H., and McConnel, J.J. 1982. The Administrative Costs of Corporate Bankruptcy: A Note. The Journal of Finance. 37, 219-226.

Ball, R., Li, X., and Shivakumar, L. 2015. Contractibility and Transparency of Financial Statement Information Prepared Under IFRS: Evidence from Debt Contracts Around IFRS Adoption. Journal of Accounting Research. 53.

Banerji, S. and Bose, P. 2006. Asymmetric Information, Delay Costs and Choice of Workout Under Financial Distress. Electronic print available at: http://www.ucd.ie/t4cms/banerji.pdf

Bartov, E., Gul, F. A., and Tsui, J. L. 2000. Discretionary-Accruals Models and Audit Qualifications. Electronic print at: https://archive.nyu.edu/bitstream/2451/27561/2/SSRN-id214996.pdf

Begley, J. and Chamberlain, S. 2005. The Use of Debt Covenants in Public Debt: The Role of Accounting Quality and Reputation. Electronic print at: http://accounting.uwaterloo.ca/seminars/old_papers/Sandra%20Chamberlain-beg-cham-ubcow.pdf

Behery, M. H., 2010. Stakeholders-oriented banks and bank performance: Perspectives from international business management. International Journal of Commerce and Management. 20: 120-150.

Beneish, M.D., and E. Press. 1993. Costs of technical violation of accounting-based debt covenants. The Accounting Review 68 (April): 233-57.

Bernard, V. L. and Skinner, D. J. 1996. What Motivates Managers' Choice of Discretionary Accruals? Journal of Accounting and Economics. 22, 313-325.

Black, F. and Scholes, M. 1973. The Pricing of Options and Corporate Liabilities. The Journal of Political Economy, The Journal of Political Economy, 81(3). 637-654.

Bowen, R., Lacey, J., Noreen, E. 1981. Determinants of the corporate decision to capitalize interest. Journal of Accounting and Economics. 3, 151–179.

Campbell, J.Y., Hilscher, J., and Szilagyi, J. 2008. In Search of Distress Risk. The Journal Of Finance. LXIII, 6.

Chava, S. and Roberts, M. 2008. How Does Financing Impact Investment? The Role of Debt Covenants. The Journal of Finance. LXIII, 5.

Chen, Kevin C. W., and K.C. John Wei. 1993. Creditors decisions to waive violations of accounting-based debt covenants. The Accounting Review. 68, 218-233.

Chen, T. 2010. Analysis on Accrual Based Models in Detecting Earnings Management. Lingnan Journal of Banking, Finance and Economics. Vol 2. Issue 1.

Chow, C. W. 1982. The Demand for External Auditing: Size, Debt and Ownership Influences. The Accounting Review. LVII, 2.

Chow, C. W. 1983. The Impacts of Accounting Regulation on Bondholder and Shareholder Wealth: The Case of the Securities Acts. The Accounting Review. 58(3). 485-520.

Christensen, H. B. and Nikolaev, V. V. 2012. Capital Versus Performance Covenants in Debt Contracts. Journal of Accounting Research. 50(1). 75-116.

Daley, L and Vigeland, R. 1983. The effects of debts covenants and political costs on the choice of accounting methods. Journal of Accounting and Economics. 5, 195-211

Darjezi, J. I. Z. 2016. The Role of Accrual Estimation Errors to Determine Accruals and Earnings Quality. Internation Journal of Accounting and Information Management. 24, 98-115.

Davydenko, S., Elkamhi, R., and Salerno, Marco. 2020. When Are Financial Covenants Relevant? Electronic Print Available at: https://ssrn.com/abstract=3554454

Dechow, P. 1994. Accounting Earnings and Cash Flows as Measures of Firm Performance: The Role of Accounting Accruals. Journal of Accounting and Economics. 18, 3-42.

Dechow, P., Sloan, R. G., and Sweeney, A. P. 1995. Detecting Earnings Management. The Accounting Review. 70, 193-225.

Dechow, P., and Dichev, I. 2002. The quality of accruals and earnings: The role of accrual estimation errors. The Accounting Review. 77, 35-59.

Dechow, P., Ge, W., and Schrand, C. 2010. Understanding Earnings Quality: A Review of the Proxies, their Determinants, and their Consequences. Journal of Accounting and Economics. 50, 344-401.

DeFond, M. L. and Jiambalvo, J. 1994. Debt covenant violation and manipulation of accruals. Journal of Accounting and Economics. 17, 145-176.

DeFond, M. L. and Subramanyam, K. R. 1998. Auditor Change and Discretionary Accruals. Journal of Accounting and Economics. 25, 35-67.

Demerjian, P. R. 2011. Accounting Standards and Debt Covenants: Has the "Balance Sheet Approach" Led To A Decline In The Use of Balance Sheet Covenants? Journal of Accounting and Economics. 52, 178-202.

Demerjian, P. R., Lev, B., Lewis, M. F., and McVAy, S. E. 2013. Managerial Ability and Earnings Quality. The Accounting Review. 88, 463-498.

Demerijan, P. R., and Owens, E. L. 2014. Measuring Financial Covenant Strictness in Private Debt Contracts. Electronic print at: https://www.uts.edu.au/sites/default/files/ACC_conf14_PDemerjian.pdf (Presented in AAA FARS)

Diamond, D. W. 1991. Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt. Journal of Political Economy. 99 (4), 689-721.

Diamond, D. W. 1984. Financial Intermediation and Delegated Monitoring. Review of Economic Studies. LI, 393-414.

Dichev, I. D. and Skinner, D. 2002. Large sample evidence on debt covenant hypothesis. Journal of Accounting Research. 40, 1091–123.

Duke, J. C. and Hunt, H. G. III. 1990. An Empirical Examination of Debt Covenant Restrictions and Accounting Related Debt Proxies. Journal of Accounting and Economics. 12, 45-63.

Dyreng, S. 2009. The Cost of Private Debt Covenant Violation. Electronic print at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1478970

Ecker, F., Francies, J., Olsson, Per., and Schipper, K. 2005. Comparing Total and Current Accruals Quality. Electronic print at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.163.4578&rep=rep1&type=pdf

El-Gazzar, S. M. and Pastena, V. 1991. Factors Affecting The Scope and Initial Tightness of Covenant Restrictions in Private Lending Agreements. Contemporary Accounting Research. 8, 132-151.

El-Gazzar, S. M. 1993. Stock Market Effects of the Closeness to Debt Covenant Restrictions Resulting from Capitalisation of Leases. The Accounting Review. 68, 258-272.

Elkamhi, R., Popov, L., and Pungaliya, R. S. 2015. Accounting Quality and Financial Covenants in Loan Contracts. Electronic Print Available at: http://www-2.rotman.utoronto.ca/facbios/file/Accounting_Quality_and_Financial_Covenantsin_LoanContracts_2014.pdf

Epstein, M. J. and Buhovac, A. R. 2006. Management Accounting Guideline: The Reporting of Organizational Risks for Internal and External Decision-Making. The Society of Management Accountants of Canada and The American Institute of Certified Public Accountants. Electronic print available at: www.cimaglobal.com/Documents/ImportedDocuments/Tech_MAG_Reporting_Organisational_Risks_for_Decision_Making_Sept06.pdf

Ethridge, J. R. and Marsh, T. 2010. User Information Risk: How It Improves Audit Quality. Journal of Business and Economics Research. Vol: 8, No, 2.

Fama, E. and French, K. 1992. The Cross-Section of Expected Stock Returns. The Journal of Finance. XLVII, 2. 427-465.

Francis, J., R. LaFond, P. Olsson and K. Schipper. 2005. The market pricing of accruals quality. Journal of Accounting and Economics. 39, 295–327.

Fung, S. Y. K., and Goodwin, J. 2013. Short-term Debt Maturity, Monitoring and Accruals-Based Earnings Management. Journal of Contemporary Accounting and Economics. 9, 67-82.

Garanasvili, A. 2019. Global Recession Impact on the Market Value of Intangible Assets. Electronic print available at: https://ideas.repec.org/p/jmp/jm2019/pga1043.html

Garleanu, N., and Zwiebel, J. 2009. Design and Renegotiation of Debt Covenants. The Review of Financial Studies. 22-2, 749-781.

Gao, Y., Khan, M., and Tan, L. 2013. Third Party Costs of Debt Covenant Violations. Electronic print at: http://www.hbs.edu/faculty/Pages/item.aspx?num=47809

Gao, Y., Khan, M., and Tan, L. 2013. Debt Covenant Violations and Auditor Monitoring. Electronic print at: https://tippie.uiowa.edu/accounting/mcgladrey/midwest-conference/khan.pdf

Ghosh, A. A. and Moon, D. 2010. Corporate debt financing and earnings quality. Journal of Business Finance and Accounting. 37(5), 538-559.

Gilson, S. C. and Warner, J. B. 1998. Private Versus Public Debt: Evidence from Firms that Replace Bank Loans with Junk Bonds. Electronic Print Available at: https://ssrn.com/abstract=140093

Gu, Z., Lee, C. J., and Rosett, J. G. 2004. What Determines the Variability of Accounting Accruals? Electronic Print Available at: http://link.springer.com/article/10.1007%2Fs11156-005-6869-1

Guay, W. R., Kothari, S. P., and Watts, R. L. 1996. A Market-Based Evaluation of Discretionary Accrual Models. Journal of Accounting Research. 34, 83-105.

Healy, P.M. 1985. The effect of bonus schemes on accounting decisions. Journal of Accounting and Economics. 7, 85-107.

Hirschheim, R. A. 1985. Information Systems Epistemology: An Historical Perspective. Electronic Print Available at: https://ifipwg82.org/sites/ifipwg82.org/files/Hirschheim_0.pdf

Holthausen, R. W. 1981. Evidence on the effect of bond covenants and management compensation contracts on the choice of accounting techniques: The case of the depreciation switch-back. Journal of Accounting & Economics. (January): 73-109.

Holthausen, R. W. and Leftwich, R. W. 1983. The Economic Consequences of Accounting Choice: Implications of Costly Contracting and Monitoring. Journal of Accounting and Economics. 5, 77-117.

Hull, J. 2012. Options, Futures and Other Derivatives. 8th ed. Chapter 24.

Islam, M. A., Ali, R., and Ahmad, Z. 2011. Is Modified Jones Model Effective in Detecting Earnings Management? Evidence from a Developing Economy. International Journal of Economics and Finance. 3, 2.

Janes, T. D. 2003. Accruals, Financial Distress, and Debt Covenants. Working Paper. University of Michigan Business School.

Janes, T. 2011. Accruals as a Determinant of Debt Covenant Tightness. Electronic print at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=930855

Jensen, M. C., and Meckling, W. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics. 305-360.

Jha, A. 2013. Earnings Management Around Debt Covenant Violations - An Empirical Investigation Using a Large Sample of Quarterly Data. Journal of Accounting, Auditing and Finance. 28, 369-396.

Jones, J.J. 1991. Earnings Management During Import Relief Investigations. Journal of Accounting Research. 29.

Kaplan, R. S. 1975. The Significance and Investigation of Cost Variances: Survey and Extensions. Journal of Accounting Research. 13, 311-337.

Leftwich, R. W. 1981. Evidence on the impact of mandatory changes in accounting principles on corporate loan agreements. Journal of Accounting & Economics 3 (January): 3-36.

LeLand, H. E. and Pyle, D. H. 1977. Information Asymmetries, Financial Structure, and Financial Intermediation. Journal of Finance. 32, 371-387.

Lev, B. and Sunder, S. 1979. Methodological Issues in the Use of Financial Ratios. Journal of Accounting and Economics. 1(3). 187-210.

Mackay, P. and Phillips, G. M. 2005. How Does Industry Affect Firm Financial Structure? The Review of Financial Studies. 18, 1433-1466.

Maddala, G. S. 2001. Introduction to Econometrics. 3rd Edition. Wiley. New York.

Mather, P. and Peirson, G. 2006. Financial Covenants in the Markets for Public and Private Debt. Accounting and Finance. 46, 285-307.

McNichols, M. F. 2002. Discussion of - The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. The Accounting Review. 77, 61-69.

Merton, R, C. 1973. Theory of Rational Option Pricing, The Bell Journal of Economics and Management Science. 4(1). 141-183.

Merton, R, C. 1974. On the Pricing of Corporate Debt: The Risk Structure of Interest Rates. The Journal of Finance. 29(2). 449-470 .

Murfin, J. 2012. The Supply-Side Determinants of Loan Contract Strictness. The Journal of Finance. 67, 1565-1601.

Myers, S, C. 1977. Determinants of Corporate Borrowing. Journal of Financial Economics. 5(2). 147-175.

Nini, G., Smith, D. C., Sufi, A. 2012. Creditor Control Rights, Corporate Governance, and Firm Value. The Review of Financial Studies. 25, 1713-1761.

Pae, J. 2005. Expected Accruals Models: The Impact of Operating Cash Flows and Reversal of Accruals. Review of Quantitative Finance and Accounting. 24, 5-22.

Pae, J. 2011. A Synthesis of Accrual Quality and Abnormal Accrual Models: An Empirical Investigation. Asia-Pacific Journal of Accounting & Economic. 18, 27-44.

Paglia, J. K. 2002. An Overview of Covenants in Large Bank Loans. Electronic Print Available at: https://cms.rmau.org/uploadedFiles/Credit_Risk/Library/RMA_Journal/Other_Topics_(1998_to_present)/An%20Overview%20of%20Covenants%20in%20Large%20Bank%20Loans.pdf

Peasnell, K. V., Pope, P.F., and Young, S. 2000. Detecting Earnings Management Using Cross Sectional Abnormal Accruals Models. Accounting and Business Research. 30, 313-336.

Petersen, M. A. 1999. Banks and the role of lending relationships: Evidence from the U.S. experience. Electronic print at: http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/published/bank.pdf

Perotti, P. and Wagenhofer, A. 2014. Earnings Quality Measures and Excess Returns. Journal of Business Finance and Accounting. 45, 545-571.

Qi, S. Z., Subramanyam, K. R., and Zhang, J. 2010. Accrual Quality, Bond Liquidity and Cost of Debt. Electronic print at: https://msbfile03.usc.edu/digitalmeasures/jieying/intellcont/QSZ20100827-1.pdf

Rajan, R. and Winton, A. 1995. Covenants and Collateral as Incentives to Monitor. The Journal of Finance. 4, 1113-1146.

Ramanna, K., and Roychowdhury, S. 2010. Elections and Discretionary Accruals: Evidence from 2004. Journal of Accounting Research. 48, 445-475.

Roberts, M. R. and Sufi, A. 2009. Financial Contracting: A Survey of Empirical Research and Future Directions. Annual Review of Financial Economics. 1, 1-20.

Rowe, D. C. 2015. Periodic Reporting in a Continuous World: The Correlating Evolution of Technology and Financial Reporting. Duke Law & Technology Review. 13. 248-266.

Skinner, D. J. 2011. Discussion of 'Accounting Standards and Debt Covenants: Has the 'Balance Sheet Approach' Led to a Decline in the Use of Balance Sheet Covenants?'

Sloan, R. G. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? The Accounting Review. 71, No. 3, 289-315.

Smith, C. W. 1993. A perspective on accounting-based debt covenant violations. The Accounting Review. 68, 289-303.

Spiceland, C. P, Yang, Leo. L. and Zhang, J. H. 2015. Accounting Quality, Debt Covenant Design, and the Cost of Debt. Review of Quantitative Finance and Accounting. 47. 1271 – 1302.

Sufi, A., Nini G, and Smith, D.C. 2009. Creditor Control Rights, Corporate Governance, and Firm Value. Electronic print available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1344302&download=yes

Sweeney, A. P. 1994. Debt covenant violations and managers' accounting responses. Journal of Accounting and Economics. 17, 281-308.

Wald, J. 1999. How Firm Characteristics Affect Capital Structure: An International Comparison. Journal of Financial Research. 22. 161-187.

Watts, R. and Zimmerman, J. 1978. Toward a positive theory of the determination of accounting standards. The Accounting Review. 53, 112-134.

Watts, R. and Zimmerman, J. 1986. Positive Accounting Theory. Englewood Cliffs, NJ: Prentice-Hall, 1986.

Watts, R. and Zimmerman, J. 1990. Positive Accounting Theory: A Ten Year Perspective. The Accounting Review. 65, 131-156.

Weiss, L.A. 1990. Bankruptcy Resolution - Direct Costs and Violation of Priority of Claims. Journal of Financial Economics. 27, 285-314.

Wysocki, P. 2009. Assessing Earnings and Accruals Quality: US and International Evidence. MIT Sloan School of Management. Available at: https://pdfs.semanticscholar.org/2267/35454d75de3be5a91efe6445a7964822aa58.pdf

Zelner, A. and Theil, H. 1962. Three-Stage Least Squares: Simultaneous Estimation of Simultaneous Equations. Econometrica. 30, 54-78.