Understanding Credit Ratings and their Drivers: An Empirical Study of U.S.-based Corporations

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Abstract

This text sets out to examine what the general quantitative drivers of corporate credit ratings are. The result from an OLS regression identifies the following drivers: sales, the size of EBITDA in relation to debt, profitability, and interest coverage. When comparing the ratings from the agencies on a stand-alone basis, there are some differences. While interest coverage is a driving factor of S&P's ratings, the results for that variable were ambiguous for Moody's and Fitch. Furthermore, the analysis of Moody's showed that the profitability measurement of EBIT-margin was a driving factor rather than return on assets as for the two other agencies. Examining the incentives of managers to target specific credit ratings also gave support to the idea that a driving factor of credit ratings is managerial decision-making.

Contents

1. Introduction

Credit ratings is a relatively new research area compared to many others in the economic discipline. According to Cantor (2004), credit risk has been one of the most active areas in financial research. A focus which has been driven by advances in portfolio theory, credit derivatives trading, and new regulations. Furthermore, according to Jeon & Lovo (2013), the subprime crisis and the following euro-crisis have created a tremendous interest in the field and there has been an explosion in the economic literature since then. There are many aspects of credit ratings that are examined, and some examples of these aspects are the following. Norden and Weber (2004) examines the impact of credit ratings changes on stocks and credit default swaps. Elton, et al. (2004) builds upon the idea of credit ratings as a tool for pricing corporate bonds and identifies other factors affecting the pricing as well. Jory, et al. (2016) study credit ratings effect on premiums paid in mergers and acquisitions (M&A). These authors found support for the idea that credit ratings lower the information asymmetry between buyers and sellers and thus decrease the M&A premium. And Attig, et al. (2013) examines the connection between corporate social responsibility and credit ratings. Undoubtedly, credit ratings play a large role in many aspects of our economy. From the examples of studies above, we can see that credit ratings are an important source of information. Therefore, creating an understanding of the driving factors of credit ratings themselves would offer deeper insights in the area.

The purpose of this text is to examine the general drivers of corporates' long-term issuer credit ratings. Not only are quantitative factors of the corporate examined, but also the idea that manager's decision-making is a driving force of credit ratings is explored. Furthermore, the study explores whether there is any differences in the quantitative drivers of the credit ratings from the three big rating agencies. To identify the quantitative drivers of credit ratings, an empirical study of U.S.-based corporations is conducted. For the empirical analysis a standard OLS regression is used. Regarding the examination of managerial motives, the discussion will be based on previous research in the area.

In the endeavour of examining the drivers of credit ratings the text is structured in the following manner. Section 2 will provide a general background of the subject to give the reader an understanding of credit ratings for the commencing sections. Section 3 will discuss and examine the methodology of the credit rating agencies to provide insights on the general framework and a rationale for the data used. Section 4 discusses costs related to different credit ratings to

provide a theoretical framework to explore the idea of managerial decisions as a driving factor of ratings. Section 5 provides information on the data used in the empirical analysis and an overview of the gathering of said data. In section 6 the results from the regression analysis are presented and analysed. Section 7 analyses the cost related to different credit ratings and tries to draw conclusions whether managerial motives are in fact drivers of ratings. Lastly, in section 8 the conclusions that can be drawn from the two previous sections are presented.

2. Background

2.1 Risk Premiums

The value of debt instruments and debt transactions depends on a couple of variables: future cash flows, the risk-free interest rate (for example the London Inter Bank Offering Rate (LIBOR)), and a risk premium. A premium which compensates the investor for the risk he or she is taking with the investment. The process of calculating the value of the debt instrument is, when these variables are known, fairly straight forward. One only has to calculate the present value of the future cash flows with the discount rate, consisting of the reference rate and the risk premium. For most debt instruments the future cash flows are pre-determined and, therefore, often referred to as fixed-income assets. The reference rates are also easily available in the form of public information from the banks. Deciding the risk premium, though, is not as straight forward. The risk premium is calculated (see for example Byström (2010)) by first assessing the probability that the issuer/borrower will default during the year. The second step is to calculate the fraction of the outstanding debt which can be recovered in the case of a default. When these two figures have been calculated one can find the risk premium by multiplying the risk of default with the recovery rate. For example, if the Recovery rate is 70% and the Risk of default is 5% then the risk premium would be 0.7*0.05 = 0.035. That amount is then added to the discount rate.

How the default risk and recovery rate is evaluated depends on what kind of entity the borrower/issuer is. The credit evaluation of a private persons who is seeking to take out a mortgage differs greatly from the evaluation from a corporate issuer of public bonds or from a sovereign state seeking funding for its expenses. As the paper's focus will be on corporates, all other entities are left out from the discussion. An investor interested in investing in a corporate bond, or a bank interested in lending to a corporate is in need of information to assess the risks.

To gain this information the individual or the bank can analyse the corporation's business and financials on its own. But, conducting rigorous analysis for every investment opportunity is time-consuming. Furthermore, the individual analyst may be lacking the knowledge to evaluate the credit risk effectively. So, to solve these problems one can use the assessment of third parties, namely Credit Rating Agencies (CRAs).

2.2 Credit Rating Agencies & Ratings

CRAs are organisations which assess the credit-worthiness of various entities and fixed-income securities. The three largest and most influential agencies are Standard & Poor's (S&P), Moody's, and Fitch. The agencies were founded in the beginning of the 20th century and started out rating railroads bonds. The agencies essentially offer judgement on credit-worthiness of various debt products, such as bonds and securitized debt[1], and of issuers themselves. The judgements come in the form of ratings, depicted as letter combination on a scale. The scale of S&P is the most well-known ratings scale: AAA, AA, A, BBB, etc., ending at D (see for example Santos (n.d.)). The highest credit-worthiness is depicted with a triple AAA, and going down the ladder as the credit-worthiness deteriorates. In **Table 1**, a thorough overview of the different ratings of the CRAs are presented.

According to White (2009), the rating industry started by selling their bond ratings to investors. A business model that, in today's terminology, would be classified as "investor pays". In 1936 the relationship between the CRAs and US bond markets changed. White (2009) writes that in 1936 new rules, issued by the Office of Comptroller of the Currency (OCC)[2], prohibited banks from investing in "speculative investment securities" as determined by the CRAs (credit ratings are usually classified as "investment grade" or "speculative grade" where investment grade are ratings that are above BBB- or its equivalent). Thus, the position of the three big and a handful of other agencies was cemented in the market by the rule of law. White (2009) writes that in the following decades insurance regulators and pension funds regulators followed with similar regulations, creating a situation where the financial institutions had to act according to the judgement of a few agencies. In 1975 the Securities and Exchange Commission (SEC)[3] further

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[1] An example of securitized debt is Mortgage Backed Securities, which are securities that consists of several different mortgages whose cash-flows are packaged into one specific product.
[2] OCC is an independent bureau within the United States Department of Treasury whose responsibility it is to regulate national banks and foreign banks active in the U.S.
[3] SEC is an agency which has the responsibility of overseeing and proposing rules regarding the trade of securities

cemented the market power of the three big rating agencies by issuing new rules that linked ratings with capital requirements sensitivity. Since the foundation the agencies have grown immensely. A growth which has been contributed to by governmental agencies. According to Jeon and Lovo (2013), the three big CRAs (i.e. S&P, Moody's and Fitch) control together approximately 95% of the credit ratings market, basically making the market into an oligopoly with only three firms. S&P and Moody's control approximately 40% each and Fitch control the last 15%. One more thing to note regarding the CRAs is the business plan of today. As earlier mentioned, CRAs were paid by investors who wanted get access to the rating information. That payment model has changed, and the market is, according to Jeon and Lovo (2013), today characterized by the "issuer pay" model. This means that the companies that want the benefits of ratings have to pay for it themselves.

2.2.1 Ratings & Risk Premiums

The ratings are divided into different kinds. First, there is short-term ratings and long-term ratings. Short-term ratings concern the likelihood of defaulting during a restricted time-horizon, usually no more than a year. While long-term ratings have no time restrictions. The short-term ratings also use a different scale, but as these types of ratings will not be the focus of this text that discussion will be cut short. Second, there is issue and issuer ratings. The purpose of issue ratings is to give a specific rating to a debt security. For example, if a corporate issue two different bonds with varying degree of seniority (thus affecting the risk premium) the securities can be assigned different issue ratings. In other words, the issue rating concerns the issuer's capacity to meet the obligations of that specific security. Issuer ratings, on the other hand, concerns the corporate itself. It is that rating which is determined by the company's fundamentals and other parameters affecting the repayment ability (the methodology of issuer ratings will be discussed more in depth in section 3). The issuer rating is also affecting which rating will be given for an issuance of a debt product (Standard & Poor's, 2018). The purpose of this text is to examine long-term issuer ratings so the text will be delimited to that.

From the **Table 1** we get an overview of the various issuer ratings for the three CRAs. As we move further down from the prime ratings we see an increase in the credit spreads. The data of the credit spreads are for 10-year corporate bonds. With credit spreads, one refers to the difference between reference interest of a security and the actual interest rate of the security. Therefore, we can understand the credit spread as the risk premium, which is affected by the default risk and recovery rate. As we can see there is a strong correlation between the rating

and the interest paid by the issuer for the debt. So, the ratings have a large impact on the cost of capital for the corporations. It should be mentioned that the spreads in Table 1 refers to specific issue ratings. But, as issue and issuer ratings are strongly linked, we can still use them as a proxy of issuer rating to see the impact of ratings on the cost of capital.

Table 1

S&P and Fitch	Moody's	Spread 2018	Description	
AAA	Aaa	0,54%	Prime	**Investment Grade**
AA+	Aa1			
AA	Aa2	0,72%	High Grade	
AA-	Aa3			
A+	A1	0,90%	Upper	
A	A2	0,99%	Medium	
A-	A3	1,13%	Grade	
BBB+	Baa1		Lower	
BBB	Baa2	1,27%	Medium	
BBB-	Baa3		Grade	
BB+	Ba1	1,98%		**Speculative Grade**
BB	Ba2	2,38%	Speculative	
BB-	Ba3			
B+	B1	2,98%		
B	B2	3,57%	Highly Speculative	
B-	B3	4,37%		
CCC+	Caa1			
CCC	Caa2	8,64%	Substantial Risk	
CCC-	Caa3			
CC	Ca	10,63%	Extremely speculative	
C		13,95%	Default imminent	
Below C	Below Ca	18,60%	In Default	

Source: Spreads available at NYU Stern, http://people.stern.nyu.edu/adamodar/pc/datasets/ bondspreads.xls. For the rating scales, see for example (Santos, n.d.)

The distinction between investment grade and speculative should also be taken into considerations. As previously mentioned, there is regulations prohibiting financial institutions from acquiring speculative grade securities. So, going from BBB- to BB+ does not only increase the cost of debt but it also lowers the accessibility of funding.

3. The Rating Agencies' Methodology

As previously mentioned, the three dominant actors in the rating industry are S&P, Moody's and Fitch. Even though the ratings are comparable among the agencies, the methodologies have some differences. Therefore, it is not uncommon to see a corporate with ratings from two different agencies that differs a notch[4]. To gain a better understanding of the differences in the methodology used by the agencies and to provide a rationale for the data used, a discussion will be held regarding the methods. Furthermore, by understanding the methodology of the CRAs we will gain better insights from section 4, which covers various costs of credit ratings. The following discussion will, of course, not be able to cover all aspects of the CRAs' methodology but we will able to gain a general picture of the approach that they take.

3.1 Standard & Poor

Depending on what kind of entity that is being rated, the methodology will differ. For non-financial corporates, the following information can be found in Standard & Poor's (2013a) regarding their corporate methodology. The first step S&P undertakes is to evaluate the corporates business risk profile and financial risk profile. Once these profiles are created, S&P gives the corporate an anchor rating, which will be the foundation for the final issuer rating. That anchor rating will then be altered by what S&P call modifiers. The modifiers consist of diversification, capital structure, financial policy, liquidity, management & governance, and comparable rating analysis. The modifiers does not change the anchor rating fundamentally. Instead, the modifiers work in a manner of increasing or decreasing the anchor rating one or two notches depending on the assessment of, for example, the capital structure. Once the anchor rating is modified, S&P gives the corporate a stand-alone rating profile. Before reaching a final rating conclusion, the stand-alone profile goes through a stage where the rating will be constrained by the relevant sovereign rating and transfer convertibility assessment. If the final issuer rating is to be higher than the relevant sovereign rating, certain conditions has to be met. So, by using corporates registered in the same country for the regression analysis, the effects of the sovereign ratings should be minimized. After the final assessment, the corporate is given

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[4] A notch refers to the step of, for example, a minus-rating to a flat rating or a Aa2 rating to a Aa3 rating

its issuer rating. The conceptual frame work of S&P's rating methodology described above is presented in figure 1.

Figure 1
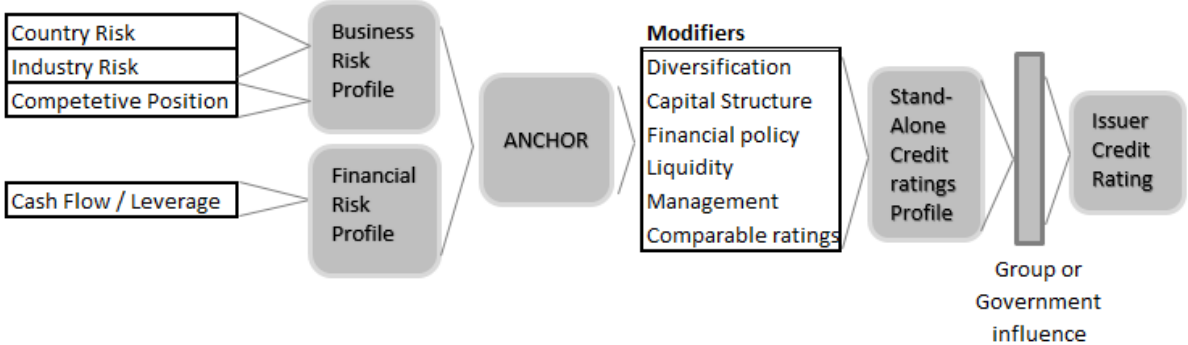
An overview of S&P's corporate rating framework

As the focus will be on the quantitative aspects, the qualitative factors will be touched upon only briefly. To create the business risk profile, S&P examines three factors: country risk, industry risk, and competitive position. Country risk refers to risks associated with the economic situation, institutions and government, financial system, and payment culture in the countries in which the corporate is active. Industry risk concerns the relative stability of the sector in which the corporate is active. Here the profitability and cyclicality of the industry is assessed. Competitive positions concerns factors of the corporate's position relative to its peers in the industry. Factors such as strategic positioning, business model, customer base, etc. are taken into consideration. Furthermore, two quantitative aspect is also assessed here, namely profitability and size of the corporate. To assess profitability S&P relies on the following key performance measurements: return of capital[5] (ROC), EBITDA margin[6], and sector specific measurements. And for size S&P examines the corporates total revenues and market share.

The financial risk profile is created by conducting a quantitative cash flow and leverage analysis. In that endeavour, so-called core ratios and supplemental ratios are used. The core ratios will be the foundation of the evaluation and the supplemental ratios will be used, if deemed necessary, to fine-tune the assessment and either confirm or adjust the results from the core ratios. The two key performance measurements that are used are funds from operations

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[5] Return on capital is calculated by dividing net Income with interest-bearing debt and Equity
[6] EBITDA is the earnings before tax with depreciations and amortizations added back. EBITDA is then divided by sales to get the margin

(FFO) to debt and debt to EBITDA. In Standard & Poor's (2013b) it is stated that the financial statements are the starting point of the analysis. But, it is not always the case that the figures accurately represent the economic situation behind them. Therefore, S&P will make adjustments to the figures if deemed necessary. Debt, which is defined by S&P as gross interest-bearing debt minus cash & cash equivalences, can for example be adjusted by adding costs for issuance or hedging costs related to the debt. Whether S&P is to make these adjustments depends on the situation as the purpose is to make the figures comparable across sectors and countries.

There are five supplemental ratios used by S&P. Three cash flow ratios and two coverage ratios. The cash flow ratios consist of, cash flow from operation (CFO) to debt, free operating cash flow (FOCF) to debt, and discretionary cash flow (DCF) to debt. The coverage ratios consist of EBITDA to interest and FFO plus interest to cash interest. Which ratios to use is up to S&P to decide depending on which sector the corporate is active in and other factors which might affect the insight of certain ratios. For example, S&P writes that corporates that working capital-intensive may have EBITDA and FFO figures that overstate the financial health. Thus, it could be more accurate using CFO. S&P looks at the ratios over a five-year horizon. Two of those years are forward looking. The current year and the two forward-looking periods are given more weight than the two present years.

3.2 Fitch

As S&P does, Fitch relies on both qualitative and quantitative factors for their corporate ratings. Fitch (2019) states that they rely on six key rating factors: sector-risk profile, country risk, corporate governance, group structure, business profile, and financial profile. If we compare these factors with that of S&P we see a resemblance. What the CRAs do is to take a holistic view of the corporate and incorporates many factors in their rating evaluations. For the purpose of the empirical analysis, we will proceed to the quantitative aspects of Fitch's methodology.

In the business profile, Fitch looks at size of the corporate measured in sales. But the majority of the quantitative factors are found in the financial profile. According to Fitch, the key elements in determining a corporates financial health are its cash flows and profits. In evaluating these aspects Fitch make use of several key ratios. When calculating these ratios Fitch makes adjustments to the figures of the financial reports to better capture the underlying economic

situation. Many of the ratios are fairly similar and can for example be variations of debt to EBITDA ratio where the numerator or denominator has been altered by adding an element to capture information which are industry-specific. To make this section more succinct, focus will be on the general ratios which are broadly applicable to corporates[7]. The ratios are divided in to four different types: profitability/cash flow ratios, leverage ratios, coverage ratios, and liquidity ratios.

The general profitability/cash flow ratios consists of EBIT margin, FFO margin, FCF margin, capital expenditures (cap ex) to CFO, CFO margin, and EBITDAR[8] margin. The leverage ratios consists of, among others, gross debt to EBTIDAR, net debt to EBTIDAR, gross debt to FFO, net debt to FFO, net debt to (CFO − cap ex) and net debt to EBITDA. The coverage ratios consists of, for example, FFO to interest, EBITDA to interest, and CFO to capital expenditures. The last type of ratios, liquidity ratios, consist of FFO to debt service[9]. As with the ratios used by S&P, Fitch base them on current, forecasted, and historic figures, with more weight given to current and forecasted figures. In general it can be said that the ratios used by S&P and Fitch are fairly similar. Both the agencies focus on cash flows in relation to outstanding debt and interest. A notable difference between S&P and Fitch though, is that Fitch relies on a considerable amount more ratios than what S&P does. Furthermore, Fitch make use of cap ex explicitly in their ratios. In the empirical analysis we do not want to capture the effect of specific ratios, rather we want to see the effect of general drivers of the credit ratings. So, for the upcoming regression, the focus will be on, for example, one leverage ratio, instead of comparing the effects of net debt to EBITDA and net debt to EBTIDAR.

3.3 Moody's

Describing Moody's methodology in a general manner is somewhat more challenging compared to the other CRAs. Instead how having a general document applicable to all corporates, with supporting documents for industry specific considerations, Moody's have documents describing the methodology for each of their defined industries. To solve this problem, we can analyse some of the methodology guides to find Moody's general approach.

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[7] For further reading on alternations of the various ratios see Fitch (2019, p. 47-51)
[8] EBITDAR is defined as EBTIDA + lease expenses for operational leases
[9] Debt service is defined as interest paid + preferred dividends + current maturities (debt maturing in less than one year)

When looking at the methodologies, found in Moody's (n.d.), for the following industries: software, global packaged goods, building materials, business and consumer service, construction, and paper and forest products, one can see the general picture of the framework. There are five factors that are recurring. These factors are scale, business profile, profitability, leverage, coverage, and financial policy. All factors which are in line with those of the two other CRAs.

For the quantitative aspect of Moody's methodology, they look at different ratios depending on which industry is being evaluated. But, we should still be able to identify key drivers of Moody's credit ratings. For the factor scale, Moody's examines the size of the corporate, most often measured in total sales. The measurement of scale is in some instances also complemented by EBITA or CFO. Profitability is measured by ratios such as EBIT to average of total assets, EBIT margin, and EBITDA margin. The second quantitative factor, leverage and coverage, are measured by factors such as gross debt to EBITDA, EBITDA to interest, and FFO to net debt. A notable difference between the CRAs in regard to the type of debt used. S&P uses net debt in relation to EBITDA and Fitch use both net debt and gross debt. Moody's, on the other hand, uses gross debt.

3.4 Relevant Quantitative Factors

Now when we have an overview of the various quantitative factors used by the CRAs, we can decide which of these factors should be examined in the empirical analysis. The quantitative key-areas of focus seems to be scale, profitability, interest coverage, and leverage. Furthermore, it would be interesting to examine the impact of equity funding in relation to debt funding. Therefore, a ratio is added to capture the effect of funding structure. So, for the upcoming empirical analysis the variables in **Table 2** will be used as a starting point. To gain further understanding of differences between the agencies complementary ratios mentioned in the methodologies will also be used.

Table 2

Type	Description	Calculations
Scale	Sales	ln(Sales)
Interest Coverage	CFO to Interest Expenses	CFO/Interest Expenses
Profitability	ROA	Net Income/Total Assets
Leverage	Net Debt to EBITDA Gross Debt to EBITDA	(Gross Debt – Cash)/EBITDA Gross Debt/EBITDA
Funding Structure	Equity to Gross Debt	Equity/Gross Debt

The sales figure of the company is often used by the CRAs to measure size. As we have seen other measurement may also be used, but sales should be an adequate measurement to see the impact of size on the ratings. For coverage, the CRAs could use various cash flow-measurements in relations to interest expenses. To avoid multicollinearity problems (this will be discussed more in length in section 6) in our regression analysis, we should avoid using the same fundamentals or highly correlated figures, as for example EBITDA and FFO, repeatedly. So, for coverage we will use CFO/interest expenses. The variable for profitability will be ROA, a standard ratio used to measure profitability and effectiveness of corporates. When the CRAs writes about leverage it refers to ratios between cash flows and debt. So, it is important that this definition does not get mixed up with the traditional definition of leverage, which concerns equity in relation to the debt of the corporate. The leverage ratio used in the analysis will be gross/net debt to EBITDA, which is used by all the CRAs. Lastly, to see the impact of the funding structure on credit ratings, equity to gross debt will be used.

As mentioned, the CRAs make various adjustments to the figures they analyse. To make the figures applicable to all the CRAs, the standard figures stated in the financial reports will be used. Furthermore, considering the different adjustments depending on industry, it would not be viable to make all these adjustments when we are searching for general drivers of credit ratings.

4. Costs of Credit Ratings

As we saw in **Table 1,** credit ratings have a large impact on the cost of capital for the corporates. It is therefore reasonable to believe that managers make decision with the corporates' rating in mind. In Kisgen (2006) the author states several instances where managers have made decisions influenced by how the credit rating will be affected. Kisgen (2006), for example, mentions the corporate EDS, which issued $1 billion in new shares to avoid a downgrade of its rating. Furthermore, Kisgen (2006) writes that Lear Corp. reduced its debt levels because it strived to reach an investment grade rating. Kisgen (2006) also mentions Fiat, which was in a race to lower its debt-levels because it was fearing a downgrade of its rating. According to Graham and Harvey (2001), credit ratings are the second highest concern for CFOs when making decisions regarding the capital structure. They found that 57.1% of the CFOs in their study said that credit ratings were important or very important when making decisions on the appropriate debt levels of the firm. Kisgen (2006) found empirical support for his hypothesis that credit ratings have a significant impact on corporates' decisions on capital structure, given discrete costs and benefits of different credit rating levels. In the study Kisgen (2009) the author builds further upon the findings in Kisgen (2006) and concludes that firms that recently faced a rating downgrade are issuing less debt. Furthermore, the effect of the downgrade is larger if the downgrade is from investment grade to speculative grade. Sajjad and Zakaria (2018) conducts similar research in which the authors examine the behaviour of non-financial listed Asian corporates. The authors concluded that the costs and benefits associated with different ratings has an impact on the corporates choices regarding their funding structure. So, when considering costs of credit ratings, there are more factors to take into account than the interest expenses.

4.1 Regulations on Bond Investments

Section 2.2 mentions restrictions imposed on financial institutions which in many cases prohibit these firms from acquiring non-investment grade bonds. A situation which creates lower demand for speculative grade bonds. Thus, lower ratings will not only increase the interest expenses because of lower demand, it will also restrict the access to funding for the corporates. Therefore, lower credit ratings impose higher costs for corporates, even though it could be the case that the corporates themselves does not have a higher risk of default. The above line of reasoning is mentioned by Kisgen (2006), who also states that the regulations may affect the market liquidity for bonds in different ratings. According to Patel, et al. (1998), low liquidity

affects the returns (interest rate) of speculative-grade bonds. So, the speculative grade market is imposed with factors that does affect the interest paid by the corporates not related to the default risk. Furthermore, Kisgen (2006) writes that speculative grade corporates will have a harder time accessing funds in economic downturn. With lower liquidity, it will be harder to issue debt, thus firms with these ratings would incur additional costs.

4.2 Costs Directly Imposed on the Corporations

In Kisgen (2006) the author discusses several costs of corporate's issuer rating affecting the corporate in a direct way. These costs which will be discussed below. The rating affects the corporate's business operations, access to other financial markets such as the commercial paper[10], disclosure requirements (lower rated bonds has a higher degree of disclosure requirements, thus increases the firm's compliance costs), and covenants[11]. First, the ratings may affect the business operation in several ways. To enter into long-term supply contracts may require a certain credit rating from their business partner. Also, firms that enter into derivative-transactions can be required to be above a certain rating. Furthermore, mergers can be conditional on the credit rating. Second, the long-term rating of corporates affects their access to the commercial paper markets. The commercial paper market is dominated by corporates in the higher rating spectrum, e.g. investment grade corporates. So, for a firm to have access to the commercial paper market it is in general necessary that the corporate has an issuer rating of at least BBB. Last, in case of rating downgrades which triggers a covenant, corporates can incur additional costs. According to Kisgen (2006), Enron breached a covenant, caused by a rating-downgrade, and was forced to face $3.9 billion in accelerated debt-repayments. He writes that the above-mentioned example is not an isolated situation. There are many corporations with covenants linked to rating-triggers and he writes that these are most common in the investment grade to speculative grade movement.

4.3 Alternative Costs of Higher Ratings

JP Morgan (2013) shows that over the last two decades there has been a migration to lower credit ratings. To adjust for instances of a higher frequency of smaller and riskier corporates

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[10] Commercial Papers are short-term debt securities issued by corporates with maturities rarely longer than 270 days

[11] Covenants are restrictions in the debt-issuance contracts which the corporate must adhere to. A breach of a covenant often gives the lender the right to terminate the contract

being rated, the study looks at the development of 169 rated blue-chip[12] firms in the S&P 500-index during a 20-year period. The results show that 58% of these firms have a lower rating and only 28% have a higher rating. The author then proceeds to conclude that blue-chip firms are migrating to lower ratings. One might then ask the question of what the drivers are behind the migration.

The authors of the report offer several explanations. First, they evaluate the effect of debt markets with greater depth. As corporates with lower investment grade ratings now have more available funding, the alternative cost of higher ratings has increased, thus the incentives to target lower ratings have also increased. The authors support that claim by referring to data over the amount of debt issued by corporates in different ratings. The data shows debt issuance in the BBB segment has increased steadily from 2000-2013 in relation to issuance in the ratings of A and above. Thus, the incentives of having higher ratings has decreased. Second, the authors argue that historic low interest rates, especially relatively to the cost of equity, have created an opportunity for recapitalizations and acquisitions. Increased alternative costs of higher rating in the sense of lucrative acquisitions and an optimized funding structure proposes another explanation for the migration. Third, the authors discuss the implication cost of capital optimization as a reason for the migration. Given a beta of 1, 10-year U.S. Treasury rates as the risk-free rate, 10-year bond yields across the ratings as cost of debt, and market risk premiums of 9%, the authors state that the triple B segment minimized the average cost of capital. So, remaining in upper investment grade-ratings does not only creates a situation in which a corporate might miss out on lucrative acquisitions, but also cost minimizing opportunities in the sense of more debt financing. The author does not, however, state exactly how that conclusion was reached, but it still offers some insights into the behaviour of the corporates. Fourth, the author proposes that the migration is an answer to shareholders and investors. The authors write that in the low-interest environment investors are more positive to debt financed acquisitions and recapitalizations. Recently, some of the largest firms has complied with the interest of the investors and issued more debt and commenced share-buybacks, the authors write.

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[12] Blue-chip corporates are a widely used term for corporates which are nationally recognized, well-established, and financially sound

5. The Data

5.1 Data Gathering

The data used is gathered from Bloomberg and the Compustat – North America Daily database. The corporates in this study is all companies which are included in the S&P Composite 1500 index. According to Standard & Poor's (n.d.) the index consists of corporates ranging from large cap to small cap and captures 90% of the U.S. market capitalization. The purpose of the index is to replicate the performance of the U.S. equity market. By using the corporates in this index, the regression analysis should be able to capture the impact on ratings for the market as a whole.

The initial data was gathered from Bloomberg, where the ratings from the three CRAs are available. As it is the drivers of non-financial corporates that are examined, all financial corporates such as banks, insurance agencies, real-estate companies, etc. were filtered out. The exclusion of financials is in line with the method of Kisgen (2006), which also examined corporates' issuer ratings. When the list of corporates was compiled, all corporates lacking at least one rating from the three CRAs were deleted. There were instances when corporates were listed in the index twice because they had two equity securities listed (e.g. A and B equity securities). Once these were filtered out, the fundamentals of the remaining companies were gathered from the Compustat database. The following fundamentals were gathered: total assets, common equity, cash & cash equivalences, EBITDA, current debt, long-term debt, net income, CFO, sales, interest expenses, EBIT, and capital expenditures[13]. These fundamentals were then used to calculate the ratios in **Table 2.** After filtering out corporates lacking ratings, being listed twice, or missing fundamentals, the sample consisted of 655 observations. The number of ratings are 647, 243, and 91 from S&P, Fitch, and Moody's respectively.

The ratings in the data-set are the corporates' current issuer rating at the date of gathering (2019-05-14) and the fundamentals are for full-year of 2018 (for corporates with a broken fiscal year, fundamentals for the latest completed full-year period is used). It could be argued that the ratios should be calculated as averages over a time-period in line with the methodology of the CRAs. But as the forecasts used by the CRAs are not readily available, it is unviable. And, as the data-set is fairly large, the impact of the quantitative drivers should still be captured.

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[13] The codes for these items are AT, CEQ, CH, EBITDA, DLC, DLTT, NI, OANCF, SALE, XINT, EBIT, and CAPX respectively.

5.2 Data Overview

5.2.1 Rating Distribution & Interest Expenses

The ratings are translated into numbers ranging from 1 to 19 in accordance with **Table 3.** The ratings are also translated into an average rating. If a company only has a single rating the average rating will be equal to that single rating. If the corporate has two or three rating the average rating will be calculated as the average of them.

Table 3

AAA/Aaa	AA+/Aa1	AA/Aa2	AA-/Aa3	A+/A1	A/A2	A-/A3	BBB+/Baa1	BBB/Baa2	BBB-/Baa3
1	2	3	4	5	6	7	8	9	10
BB+/Ba1	BB/Ba2	BB-/Ba3	B+/B1	B/B2	B-/B3	CCC+/Caa1	CCC/Caa2	CCC-/Caa3	
11	12	13	14	15	16	17	18	19	

In **Figure 2** the distribution of the average ratings is shown. The average ratings which have decimals are rounded to the nearest integer in the graph.

Figure 2
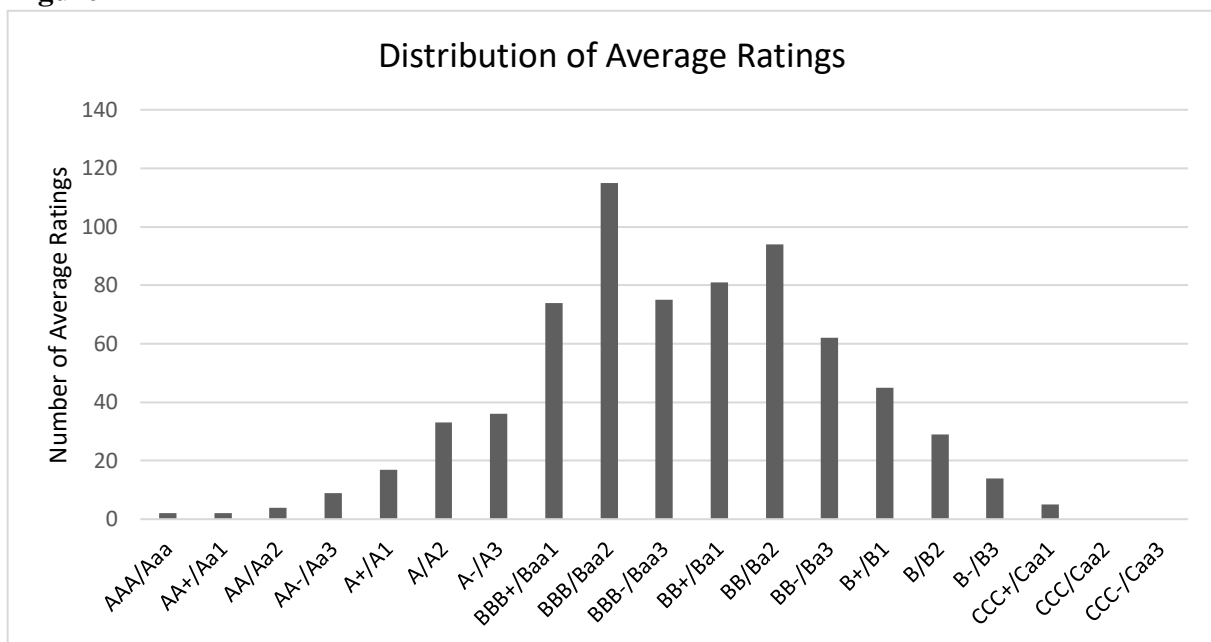
The lower investment grade-segment are predominant among the corporates, with BBB/Baa2 as the most common rating. Furthermore, we can see that BB/Ba2 is the predominant rating in the speculative grade-segment.

Figure 3 shows the distribution of the ratings per CRA. While S&P's and Fitch's ratings are distributed in a wider range, Moody's ratings are more concentrated to the lower investment grade-spectrum. Even though Moody's has a market share of 40%, its presence in the sample is over-shadowed by that of Fitch, whose market share is 15%.

Figure 3
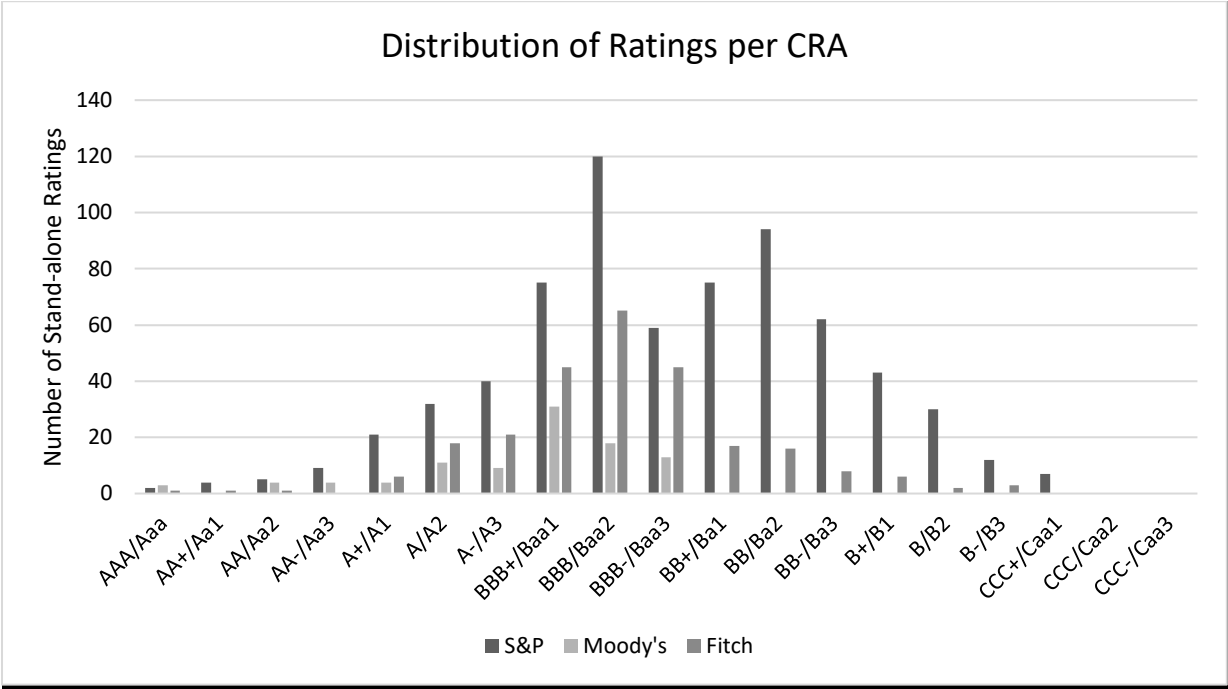
In **Figure 4** an overview of the corporates ratings in relation to their interest expenses is presented. The interest expenses are calculated by taking the income statement item, interest expenses, and dividing it with the gross debt of the corporate. The relation between ratings and interest expenses shown in the figure is maybe not as strong as one would expect. But, one has to take into consideration that the corporates are issuing debt with different maturities, different debt instruments, and during different time periods. Furthermore, the results can be somewhat skewed because of the fact how the percentage of interest is calculated. If the corporate amortizes a large portion of debt in the end of their fiscal year, the ratio of interest expenses to outstanding debt would be artificially large. Nevertheless, the graph manages to give us an overview of the interest expenses of the corporates in the sample.

Figure 4
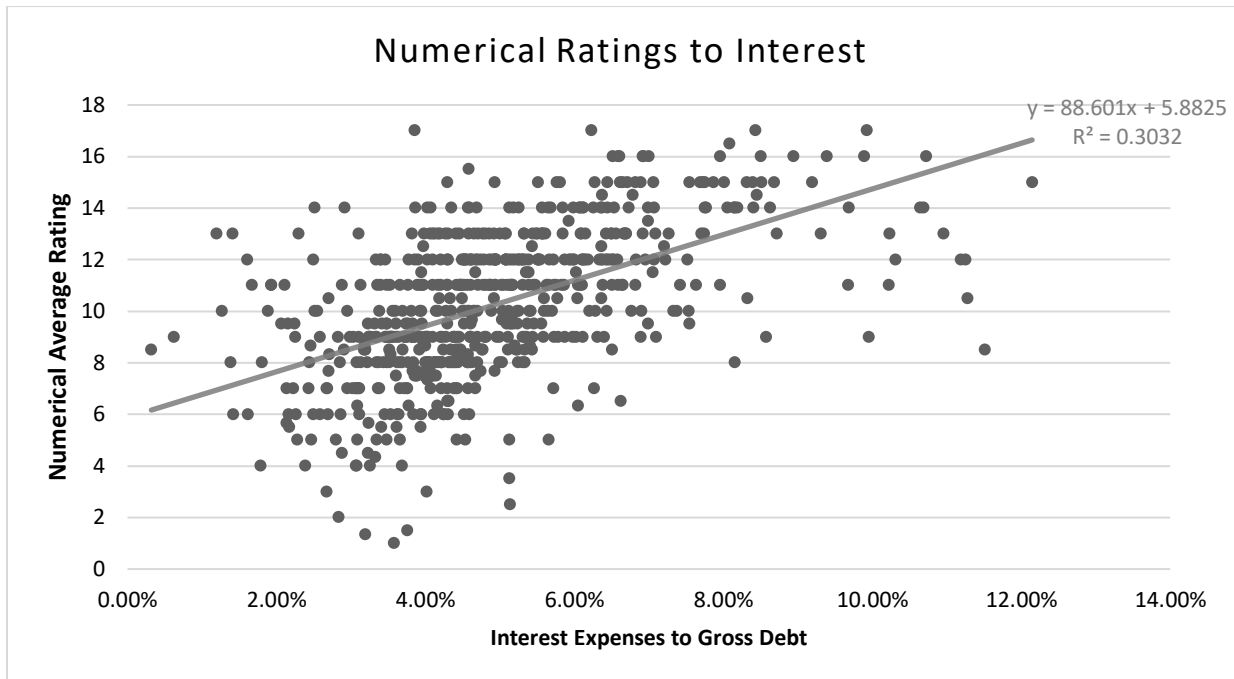
Note: Three outliers with extreme values were discarded in the figure.

5.2.2 Descriptive Statistics

In **Table 3** an overview of the numeric ratings is presented. The ratings of S&P and Fitch are distributed around the means of 10 and 9 respectively. Moody's, on the other hand, is distributed around 7.5. Furthermore, Moody's ratings are more concentrated around its means, with a standard deviation of 2,099. While S&P's and Fitch's ratings are ranging from 1 to 16 and 1 to 15, respectively, Moody's range is only between 1 and 10. For descriptive statistics of the dependent variables, see the appendix.

Table 3

S&P Ratings		Fitch Ratings		Moody's	
Mean	10,22	Mean	9,12346	Mean	7,451
Standard Error	0,115	Standard Error	0,1457	Standard Error	0,22
Median	10	Median	9	Median	8
Mode	9	Mode	9	Mode	8
Standard Deviation	2,925	Standard Deviation	2,27118	Standard Deviation	2,099
Sample Variance	8,555	Sample Variance	5,15825	Sample Variance	4,406
Range	16	Range	15	Range	9
Minimum	1	Minimum	1	Minimum	1
Maximum	17	Maximum	16	Maximum	10
Count	647	Count	243	Count	91

6. Drivers of Corporate Credit Ratings

To examine the impact of the identified variables on credit ratings a standard OLS regression will be used. The regression equation will have the following form:

(1) $\quad CR_i = \alpha + \beta_1 Log(sales)_i + \beta_2 \left(\frac{CFO}{InterestExpenses}\right)_i + \beta_3 ROA_i + \beta_4 Debt\ to\ EBITDA_i + \beta_5 Equity\ to\ Gross\ Debt_i$

Where CR will be the average rating along the agencies, S&P stand-alone, Fitch stand-alone, or Moody's stand-alone.

As previously mentioned there could be problems with multicollinearity. The rational for using the identified variables was to avoid multicollinearity between the variables of the key-areas identified in Section 4. By examining the correlation among the variables in **Table 4**, one can see that, in general, the correlation is low. But, between the variables ROA and debt to EBITDA and the variables CFO to interest expenses and equity to gross debt is fairly high. Nevertheless, because of the nature of the multicollinearity problem, we will still be able to gain insights from the regression analysis.

Table 4	Log(Sales)	CFO to Interest Expenses	ROA	Net Debt to EBITDA	Equity to Total Debt	Gross Debt to EBTIDA	EBIT Margin	Net Debt to (CFO - Cap ex)	Capex to CFO
Log(Sales)	1,000								
CFO to Interest Expenses	0,079	1,000							
ROA	0,120	0,147	1,000						
Net Debt to EBITDA	-0,161	-0,212	-0,422	1,000					
Equity to Gross Debt	0,042	0,318	0,078	-0,125	1,000				
Gross Debt to EBTIDA	-0,189	-0,191	-0,461	0,954	-0,121	1,000			
EBIT Margin	-0,013	0,043	0,532	-0,119	-0,029	-0,167	1,000		
Net Debt to (CFO -Cap Ex)	0,045	0,007	0,026	-0,048	0,002	-0,040	0,006	1,000	
Capex to CFO	-0,044	-0,038	-0,076	-0,017	-0,028	-0,087	0,021	-0,070	1,000

Variables with marked correlations will not be run simultaneously

6.1 Regression Analysis

6.1.1 Drivers of Average Rating

In **Table 5** the regression results with average ratings as the dependent variable is presented. Every variable has the expected sign except for equity to gross debt. Theoretically, a larger equity cushion which can absorb net losses should decrease the credit risk. Furthermore, a lower reliance of debt funding could also be viewed as positive for the credit risk. But, as the coefficient is not significant the results from the regression is still reasonable. As the ratings have been translated into numbers for which low numbers indicates higher ratings (see **Table 3**) coefficients with a negative sign indicates increasing credit ratings in the variable. The variable Log(sales), where Log is the natural logarithm, can be interpreted as 1% increase in sales leads to a -1,233/100 unit-decrease in the numerical rating.

Table 5

Regression Equation (1) - **Net Debt** is used for the Leverage measurement			
Results of the regression with **Average Ratings** as the dependant variable.			
***, **, and * corresponds to significance levels of 1%, 2.5% and 5% respectively.			
n = 655	*R Square* = 0,474771		*F Sign. = 2,6E-88****
Variable	*Coefficient*	*Standard Error*	*P-value*
Intercept	20,7***	0,5995	1E-147
Log(Sales)	-1,233***	0,0654	4,22E-62
CFO/Interest Expenses	-0,0054*	0,0023	0,043057
ROA	-5,673***	1,1589	3,86E-05
Debt to EBITDA	0,238***	0,0419	9,13E-08
Equity to Gross Debt	0,00336	0,0041	0,620292

The regression has a fairly high R square value of 44.7%. Therefore, it can be concluded that the quantitative factors in the CRA's plays a large role in determining ratings. Regarding the drivers of credit ratings, the following can be concluded. First, the size of the corporate matters. By increasing the size of the corporate, one can achieve higher ratings. The second driver is CFO in relation to interest expenses. This ratio gives information about drivers in two manners. The more debt a corporate issues, which increases the total interest expenses, the lower the rating and the more efficient the operation of the corporate is in generating cash flow, the higher

the rating. Third, the profitability of the corporate affects the rating. The more efficient a corporate is in utilising its assets and providing profits, the higher rating the corporate will be able to achieve. Last, the amount of outstanding debt minus cash is, unsurprisingly, affecting the credit rating. But, as the CRAs are evaluating the amount of debt in relation to the corporate's EBITDA, issuance of debt is only affecting the rating negatively given that EBITDA is constant. That conclusion is also supported by the fact that the variable equity to debt has an insignificant effect on the rating. Whether the corporate is funded primarily by debt or equity does not seem to be a driver of ratings. Therefore, as long as the corporates outstanding debt is increasing with as many percentage points as EBITDA does, the rating will remain unaffected.

Something to take into consideration regarding the results above, though, is that the ratings in average ratings is dominated by ratings from S&P. So, to create a more nuanced picture of the drivers, they will also be examined for the stand-alone ratings.

6.1.2   Drivers of S&P

Almost all corporates in the sample have a rating from S&P. As many as 647 of 655 has a S&P-rating. The results from running S&P stand-alone as the dependent variable gives the results presented in **Table 6**.

Table 6

Regression Equation (1) - **Net Debt** is used for the Leverage measurement			
Results of the regression with **S&P stand-alone** as the dependant variable.			
***, **, and * corresponds to significance levels of 1%, 2.5% and 5% respectively.			
n = 647	*R Square* = 0,45767		*F Sign. = 9,19E-83****
Variable	*Coefficient*	*Standard Error*	*P-value*
Intercept	20,959***	0,607245	2,5E-148
Log(Sales)	-1,261***	0,066076	1,18E-64
CFO/Interest Expenses	-0,00498*	0,00228	0,029163
ROA	-5,59346***	1,180239	2,64E-06
Debt to EBITDA	0,221***	0,042623	3,06E-07
Equity to Gross Debt	0,00348	0,004123	0,399615

As we can see, the results do not show any material differences from the regression with average ratings as the dependent variable. So, no new insights can be gained from the above regression. Therefore, the next step is to analyse the drivers of Fitch's ratings.

6.1.3 Drivers of Fitch

The second most common rating, the ratings of Fitch, amounts to 243 observations. A fair amount less than that of S&P, but still a considerable number that should be enough the gain insight of the drivers. The regression is run with the first equation and the results are presented in **Table 7**.

Table 7

Regression Equation (1) - **Net Debt** is used for the Leverage measurement			
Results of the regression with **Fitch Stand-alone** as the dependant variable.			
***, **, and * corresponds to significance levels of 1%, 2.5% and 5% respectively.			
n = 243	*R Square* = 0,383107		*F Sign.* = 3,29E-23***
Variable	*Coefficient*	*Standard Error*	*P-value*
Intercept	18,229***	0,880588	4,717E-55
Log(Sales)	-0,926***	0,0906	1,493E-20
CFO/Interest Expenses	-0,0321***	0,011088	0,0041689
ROA	-5,488***	1,984775	0,0061396
Net Debt to EBITDA	0,03897	0,076436	0,6106475
Equity to Gross Debt	0,0169**	0,006797	0,0135776

From the second regression, we get a somewhat surprising result. The coefficient for net debt to EBITDA lost its significance while the coefficient for equity to gross debt became significant. Furthermore, equity to gross debt has the wrong sign from what one would expect. Comparing the methodology of Fitch to that of S&P, there is a difference in regard to how they view debt. While Fitch use both gross and net debt in the leverage ratios, S&P make use of only the net debt. One might then ask the question if the variable equity to gross debt is in fact capturing the effect of higher debt instead of the effect of how the corporate is funded. Furthermore, the correlation between CFO to interest expenses and equity to gross debt is fairly high. Therefore, it could be the case that multicollinearity is making the results somewhat skewed. So, to find an answer to this question the same regression as before is run, with the exception of using gross debt instead of net debt.

In **Table 8** the results for the above-mentioned regression is presented. The answer to the question above seems to be that the variable equity to gross debt did capture the effect of amount of debt rather the effect of the funding structure. Furthermore, CFO to interest expenses lost its

significance, which gives merit to the idea that multicollinearity is affecting the results of equity to gross debt. As we can see in the table, the effect of gross debt to EBITDA is now in line with that of S&P. Therefore, it seems reasonable to conclude that it is debt to EBITDA which is the driving factor, and not the funding structure.

Table 8

Regression Equation (1) - **Gross Debt** is used for the Leverage measurement			
Results of the regression with **Fitch stand-alone** as the dependant variable.			
***, **, and * corresponds to significance levels of 1%, 2.5% and 5% respectively			
n = 243	*R Square = 0,346297*		*F Sign. = 2,73E-20****
Variable	*Coefficient*	*Standard Error*	*P-value*
Intercept	16,752***	0,974861	1,59E-43
Log(Sales)	-0,827***	0,101341	1,96E-14
CFO to Interest Expenses	-0,00188	0,002071	0,364368
ROA	-7,820***	1,948256	8,01E-05
Equity to Gross Debt	-0,00256	0,0048	0,594171
Gross Debt to EBTIDA	0,203***	0,070763	0,004439

Concerning the results of CFO to Interest Expenses, the results are ambiguous. In the first regression, the variable was significant but in the second it was insignificant. So, it is reasonable to not make any strict conclusions whether the variable is and driving factor of Fitch's ratings.

6.1.4   Drivers of Moody's

For the last CRA, Moody's, the observations amount to 91. The amount is considerably lower than that of Fitch and S&P. Furthermore, as shown in **Table 3**, the range of the observations only amounts to 9, spanning from Aaa, to Baa2. Because of the low amount of observation and the high concentration of observations in the investment grade spectrum, it may be challenging to acquire significant results. As Moody's use Gross Debt in its Leverage Ratios, equation 1 will be run with Gross Debt. The result of the regression is presented in **Table 9.**

Table 9

Regression Equation (1) - **Gross Debt** is used for the Leverage measurement			
Results of the regression with **Moody's stand-alone** as the dependant variable.			
***, **, and * corresponds to significance levels of 1%, 2.5% and 5% respectively			
n = 91	*R Square* = 0,474143		*F Sign. = 1,01E-10****
Variable	*Coefficient*	*Standard Error*	*P-value*
Intercept	14,681***	1,497547	1,281E-15
Log(Sales)	-0,793***	0,136793	1,12E-07
CFO/Interest Expenses	-0,0168	0,008593	**0,0538064**
ROA	-0,767	3,54775	0,8315698
Equity to Gross Debt	0,00766	0,007315	0,298361
Gross Debt to EBTIDA	0,212	0,119786	**0,0798939**

As for the other regressions, all signs for the variables are of the expected sign, except from the sign for equity to gross debt. Furthermore, we see that both CFO to interest expenses and gross debt to EBTIDA lost its significance. Even though the p-values are very close to the 5% significance level no conclusions can be made regarding the impact of these variables on the rating of Moody's. ROA, on the other hand, shows no resemblance of a significant value. As the regression gave limited results regarding the drivers of Moody's ratings, a new model of testing will be proposed. As the measurement of profitability, e.g. ROA, is correlated with debt to EBITDA, EBIT Margin will be used as a measurement of profitability instead. The new equation will have the following form,

$$(2)\ CR_i = \alpha + \beta_1 Log(sales)_i + \beta_2 \left(\frac{CFO}{Interest Expenses}\right)_i + \beta_3 EBIT\ Margin_i + \beta_4 Debt\ to\ EBITDA_i + \beta_5 Equity\ to\ Gross\ Debt_i$$

The results from equation 2 with Moody's stand-alone as the dependent variable is presented in **Table 10**.

Table 10

Regression Equation (2) - **Gross Debt** is used for the Leverage measurement			
Results of the regression with **Moody's stand-alone** as the dependant variable.			
***, **, and * corresponds to significance levels of 1%, 2.5% and 5% respectively			
n = 91	*R Square* = 0,499722		*F Sign. = 1,31E-11****
Variable	*Coefficient*	*Standard Error*	*P-value*
Intercept	15,665***	1,498412	4,2E-146
Log(Sales)	-0,833***	0,134737	1,8E-64
EBIT Margin	-3,675***	1,753331	2,47E-06
Equity to Gross Debt	0,00607***	0,007175	3,79E-07
CFO to Interest Expenses	-0,01529	0,008376	0,404279
Gross Debt to EBTIDA	0,216645*	0,107021	0,028621

With the change to the equation, the results are clearer. The results now show significant values for all variables except from CFO to interest expenses. From the regression, it can be concluded that sales, EBIT margin, and gross debt to EBITDA is driving factors behind the ratings of Moody's. Regarding the conclusion about the variables CFO to interest expenses and equity to gross debt, one should be more cautious. As CFO to interest expenses have now lost its low p-value, the impact of that variable is ambiguous. Furthermore, equity to gross debt is now highly significant. Interpreting these results as an increase in equity in relation to debt would lead to higher credit ratings seems implausible. So, it may be more reasonable to assume that multicollinearity between CFO to interest expenses and equity to gross debt is making the results skewed.

6.1.5 Further Comparisons between S&P and Fitch

Two ratios which are unique to Fitch's methodology is net debt to (CFO - cap ex) and cap ex to CFO. To further explore the differences between Fitch and S&P the two ratios above will be included in the following manner,

$$(3) \quad CR_i = \alpha + \beta_1 Log(sales)_i + \beta_2 ROA + \beta_3 Net\ Debt\ to\ EBITDA + \beta_4 Equity\ to\ Gross\ Debt_i + \beta_5 CFO\ to\ Interest\ Expenses + \beta_6 Net\ Debt\ to\ (CFO - Cap\ Ex + \beta_7 (Cap\ Ex\ to\ CFO)$$

First, the regression is run with S&P as the dependent variable. The results are presented in **Table 11**.

Table 11

Regression Equation (3) - **Net Debt** is used for the Leverage measurement			
Results of the regression with **S&P stand-alone** as the dependant variable.			
***, **, and * corresponds to significance levels of 1%, 2.5% and 5% respectively.			
n = 647	*R Square* = 0,45789		*F Sign. = 8,76E-81****
Variable	*Coefficient*	*Standard Error*	*P-value*
Intercept	21,005***	0,615531	4,18E-146
Log(Sales)	-1,263***	0,066266	1,7994E-64
ROA	-5,638***	1,185906	2,466E-06
Net Debt to EBITDA	0,220***	0,042808	3,7913E-07
Equity to Gross Debt	0,003446	0,004129	0,40427909
CFO to Interest Expenses	-0,00501*	0,002284	0,0286206
Net Debt to (CFO - Cap ex)	0,000252	0,00106	0,81178174
Cap Ex to CFO	-0,05096	0,116684	0,66246305

As expected, the newly added variables do not show any significance for S&P Stand-alone. So, the next step is to run equation 3 for Fitch stand-alone. The results for that regression is presented in **Table 12**.

Table 12

Regression Equation (3) - **Net Debt** is used for the Leverage measurement			
Results of the regression with **Fitch stand-alone** as the dependant variable.			
***, **, and * corresponds to significance levels of 1%, 2.5% and 5% respectively.			
n = 243	*R Square* = 0,323299		*F Sign. = 1,26E-18****
Variable	*Coefficient*	*Standard Error*	*P-value*
Intercept	17,020***	0,988617	1,604E-43
Log(Sales)	-0,830***	0,102386	2,81E-14
ROA	-8,260***	1,978958	4,222E-05
Net Debt to EBITDA	0,179**	0,070103	0,0113007
Equity to Gross Debt	-0,00267	0,004833	0,581236
CFO to Interest Expenses	-0,0018	0,002097	0,3924976
Net Debt to (CFO - Cap Ex)	-0,00038	0,001063	0,7180598
Cap Ex to CFO	-0,10074	0,171868	0,5583202

The results of equation 3 is in line with that of earlier regressions with Fitch Stand-alone as the dependent variable. One new future though, is that equity to gross debt now has the correct sign. But, as the results is insignificant not much can be said about the impact on the ratings. The two variables, net debt to (CFO - cap ex) and cap ex, which are unique to Fitch, did not show any significance. So, there is no new conclusions that can be made regarding the differences between the S&P and Fitch.

7. Managerial Motives as Drivers of Credit Ratings.

Taking into account the discussion of costs and benefits of credit ratings in section 4, an alternative view of the drivers of credit ratings can be formed. If the variables discussed above are viewed only as organically changing with the general business actions undertaken by corporates, one may miss out on more nuanced insights. The discussion in section 4 gives merit to idea that managers of corporates take into consideration the impact their actions will have on their firm's credit rating. The many costs associated with going from an investment grade-rating to a speculative grade-rating creates incentives for managers to make decisions to avoid facing that downgrade. Furthermore, the upper investment grade spectrum (e.g. AAA to A-) have several alternative costs that should be taken into consideration. As the benefits of the higher ratings is not as large as it used to be, corporates have incentives to capitalize on the opportunities of higher debt levels. So, considering the incentive structure facing corporates' managers it is plausible that ratings are not only descriptions of a corporates credit worthiness, but also targets themselves.

If we reminiscence the distributions of the ratings in **Figure 2** and **3**, we saw that the lower investment grade spectrum, and especially the BBB/Baa2 rating, was dominant in the sample. When that distribution is viewed in the light of the ideas presented regarding the rating migration discussed in section 4.3, it could be argued that corporates are targeting the rating levels in the BBB segment. Thus, the corporates that have the quantitative and qualitative factors of reaching the upper investment grade spectrum could potentially choose to act in a way to not reach this level. The reason being that benefits of a BBB-rating outweigh those of an A-rating or higher. Furthermore, corporates would be very cautious in their actions to not face a rating downgrade to speculative grade ratings.

Viewing the quantitative factors examined in section 7 with the above discussion in mind brings a new understanding of the drivers of credit ratings. Instead of them just being specific ratios

which the CRAs use to evaluate corporates, they could be seen as tools which corporates use to actively target ratings. Especially the ratio debt to EBITDA, which is arguably the easiest for a corporate to alter, could be considered such a tool.

8. Conclusion

The quantitative factors in the methodology of the CRAs have a large impact on credit rating decisions, as indicated by the R square values from the regression. For the average ratings it can be concluded that sales, profitability, cash flow in relation to interest expenses, and the size of the outstanding net debt in relation to EBITDA are driving factors behind the average credit ratings. That conclusion also holds true for the ratings of S&P on a stand-alone basis. But when examining the stand-alone ratings of Fitch and Moody's, we gain some new insights. While Fitch make use of both gross and net debt in their leverage ratios, it is reasonable to conclude that gross debt to EBITDA is a general driver of Fitch's ratings. Furthermore, the effect of CFO to interest expenses was ambiguous. A result which differs from that of the S&P-regression. From equation 1 we got few insights regarding the drivers of the ratings from Moody's. From equation 2, on the other hand, it can be concluded that sales, EBIT margin, gross debt to EBITDA is the driving factors behind the ratings of Moody's.

Considering the discussion in section 7, there is support for the notion that another driving factor behind ratings are active managerial decisions. It is reasonable to believe that ratings are specifically targeted, especially the ratings in the lower investment grade segment. Thus, the driving factors identified in the empirical analysis could also be seen as tools which managers use to achieve certain ratings.

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Appendix

Descriptive statistics of the dependent variable used in the various regressions.

Log(Sales)		CFO/Interest Expenses		ROA	
Mean	8,683	Mean	11,142	Mean	0,055
Standard Error	0,051	Standard Error	1,561	Standard Error	0,003
Median	8,555	Median	5,855	Median	0,051
Mode	8,289	Mode	7,134	Mode	0,031
Standard Deviation	1,303	Standard Deviation	39,945	Standard Deviation	0,080
Sample Variance	1,697	Sample Variance	1595,618	Sample Variance	0,006
Range	7,715	Range	931,426	Range	1,111
Minimum	5,401	Minimum	-12,426	Minimum	-0,390
Maximum	13,116	Maximum	919,000	Maximum	0,721
Count	655,000	Count	655,000	Count	655,000
Net Debt to EBITDA		**Equity to Gross Debt**		**Gross debt/EBTIDA**	
Mean	2,575	Mean	2,874	Mean	3,159
Standard Error	0,088	Standard Error	0,847	Standard Error	0,090
Median	2,276	Median	1,019	Median	2,712
Mode	5,954	Mode	0,318	Mode	6,525
Standard Deviation	2,250	Standard Deviation	21,686	Standard Deviation	2,313
Sample Variance	5,062	Sample Variance	470,287	Sample Variance	5,351
Range	29,820	Range	416,430	Range	38,260
Minimum	-7,467	Minimum	-2,058	Minimum	-7,467
Maximum	22,353	Maximum	414,372	Maximum	30,793
Count	655,000	Count	655,000	Count	655,000
EBIT Margin		**Net Debt/(CFO -Cap ex)**		**Capex to CFO**	
Mean	0,146	Mean	-0,845	Mean	0,486
Standard Error	0,004	Standard Error	3,136	Standard Error	0,029
Median	0,128	Median	3,425	Median	0,361
Mode	0,242	Mode	7,755	Mode	0,146
Standard Deviation	0,112	Standard Deviation	80,247	Standard Deviation	0,732
Sample Variance	0,013	Sample Variance	6439,650	Sample Variance	0,536
Range	1,582	Range	2059,292	Range	14,189
Minimum	-0,637	Minimum	-1151,667	Minimum	-8,021
Maximum	0,945	Maximum	907,625	Maximum	6,168
Count	655,000	Count	655,000	Count	655,000