Corporate Bond Credit Rating Biases:

Issuance Frequency and Yield Spreads

Samuel Marjamaa
22433@student.hhs.se

Axel Wikner
22930@student.hhs.se

The Stockholm School of Economics
Department of Finance
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Tutor: Ramin Baghai

We investigate whether rating agencies (S&P, Moody's and Fitch) award firms who issue corporate bonds frequently, and thereby contributing substantially to rating agencies' revenues, by providing unjustifiably high rating assessments. We also investigate the same bias for firm size and issue size. Testing data of US corporate bonds, we can report that there is a systematic bias toward frequent issuers. We find that frequent issuers' corporate bonds have systematically lower yields at issue, but also that the yield spread converges during post-issue trading; the prices of bonds sold by both frequent and Other issuers increase when introduced to the secondary market, but those sold by Other issuers appreciate to a greater extent.

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Keywords: corporate bonds, credit rating, rating bias, rating inflation, rating agencies, bond yield spreads, credit risk, frequency, capital markets, corporate debt.

Content

1. Introduction

As corporate financing by publicly issued debt is not completely standardized, but subject to different covenants across corporate bond issuances, rating agencies offer their assessment of different securities' credit risks in order to increase comparability between bonds. Credit ratings are provided for a variety of securities, as well as for unsecuritized underlying assets, but Veldkamp et al. (2008) report that the reliability varies with the complexity of the rated security. The fee structure in use by rating agencies has given rise to concerns about conflicts of interest in the credit rating process as the issuing company, rather than the investors who are the intended users of the ratings, pays the rating fees, as described by Strahan et al. (2012).

Increasingly since the financial crisis of '07, research has investigated the potential existence of bias among rating agencies toward specific groups of securities issuers. The majority of this research has focused on structured products such as mortgage-backed securities (MBS), however, which are generally of a far more complex nature than the body of corporate bond variations. The more complex a debt instrument is, the more the investor relies on the accuracy of credit ratings as the difficulty of assessing a certain security's credit risk increases with the complexity. As trust plays a more significant role in the credit rating assessment of structured debt products, this distinguish corporate bonds among many other rated securities. The research has identified a systematic bias in rating products. The research has, however, not yet expanded on the situation for less complex securities such as corporate bonds. That is the subject of this paper.

This paper examines whether rating agencies award biased credit ratings to institutions that represent a large portion of credit rating agencies' revenue in the corporate bond market, hypothesizing that there are discrepancies in the yield spreads between equally rated tranches from issuers who make up a relatively large share of the market and issuers who do not. To study these issuer size effects, we use three key variables to examine potential biases; the frequency of issuing publicly traded bonds, the amount issued and the enterprise value of the issuing entity. The rationale of the hypothesis builds on the fee structure applied by rating agencies. This allocates all explicit bargaining power to the institutions that want their securities rated, leaving the "consumers" of credit ratings – the investors – with no more bargaining power than the

implicit influence they could exercise on rating agencies' prudence by collectively distrusting and cease their use of the reported credit ratings also known as reputation effect of credit rating agencies as stated by Covitz & Harrison (2003).

Although corporate bonds are seasoned in debt capital markets, and have been studied from various perspectives in previous research, collected literature needs expanding. The contribution of this paper is a developed understanding of the factors that are determinant for the credit rating of corporate bonds, which is not only beneficial to sporadically issuing companies and the typical institutional investor, but also for the growing segment of household investors who are at an informational disadvantage.

There are a number of factors that complicate the testing of bonds relative other securities; testing, for instance, mortgage-backed securities in this respect has the advantage of the clustering of MBS – a majority of these structured products were found by Strahan et al. (2012) to be rated AAA, while corporate bonds appear broadly across the spectrum of credit ratings. Furthermore, corporate bonds are issued by a much less concentrated group of issuers. While there are over a thousand U.S. companies who have issued corporate bonds during the past five years, Ashcraft & Schuermann (2008) report that 95 % of the total market volume of MBS issued in 2006 was concentrated to the 25 most frequent issuers. Naturally, this has a contrasting impact on the results, as the diversity of corporate bond issuers leads to less significant differences between offerings. This further adds to the complex nature of structured debt products such as MBS, which were deliberately obfuscated by consecutive restructurings during the years prior to the credit crisis in 2007. It is widely accepted that the complexity of a product allows for arbitrary in the credit rating process of said product, which in turn amplifies the observed biases, as Skreta & Veldkamp (2009) elaborate on. With bonds situated on the other side of the spectrum – being considered easily valued and evaluated – we study if these biases are valid as the complexity of debt products decreases.

The original dataset, retrieved from TRACE via Bloomberg's database, of 5071 individual issuances between 2010 and 2015. The observations have been filtered, to remove incomplete or otherwise irrelevant values as elaborated on in section 3, and the number of observations used in the tests is 1902.

Testing the data, the results report evidence of a systematic discrepancy between rating agencies' assessments of the credit ratings of bonds issued by frequent issuers and those issued by *Other* issuers. This, surprisingly, accompanied by lower yield spreads at issue among frequent issuers than among their sporadic counterparts.

This paper consists of a brief account of the need for credit ratings for securities in general and of the practice of establishing these ratings by designated rating agencies, which can be found in section 2, along with a review of previous research on the concept of issuer size biases. Section 2 also contains a general description of previous research on the impact of relationship between corporate bonds, credit ratings & corporate financing decisions as well as cost of capital. Then section 3 presents a brief description of the data, and the subsequent section 4 concerns the selection and rationale for the chosen statistical methods used, as well as a description of the process to obtain the relevant results. Sections 5, 6 and 7 respectively address the results of the data analysis, a discussion of these results, and, lastly, the conclusions from the findings, insights regarding the issue of rating agency bias, and a selection of interesting research topics that build on our findings.

2. Theory

2.1 Background

The corporate bond market is growing to record levels, and for the asset class to be readily accessible to investors the risk associated with holding corporate bonds needs to be easily understandable. The credit ratings given to separate securities are intended to reflect the weighted risk of the investors not getting full compensation in the event of default, forming a decision basis for investors to determine which level of risk exposure corresponds to their preferences.

The problem that arises is related to the markets distrust of the way that rating agencies are compensated for rating the individual bonds. Rating agencies are paid, not by the investors that rely accurate ratings, but by the company that issues the bond, largely on a "per bond rated" basis. Alternate revenue models has fluctuated in the credit rating industry with subscription services to paying investors. In the 1970's the subscription model was actually more standard than exception, while today only one of the remaining nine credit rating agencies registered in the US apply the model as reported by the Financial Times. The overall shift in sources of revenue for credit rating agencies has been furtherly reported by Milidonis (2013). The fee structure consequently gives rise to a potential conflict of interest as the agencies are asymmetrically dependent on different clients' propensity to return to the respective agency when they require additional bonds rated.

Our hypothesis is that this manifests itself in systematically underestimated credit risks, leading to higher ratings for the "frequent issuers", as the fee structure constitutes an incentive for rating agencies to systematically underestimate the underlying risk that is intended to be reflected in the bonds' credit ratings. The hypothesis corresponds to the findings of Strahan et al. (2012) with respect to MBS, which report a systematic bias in favor of issuers who contribute a large market share. The results of our study are relevant, not only as the field stands without significant previous contribution, but also because corporate bonds are arguably the most common asset class for households to invest in, beyond equity. Although cash flows prediction from fixed income instruments are readily available, the assessment of a firm's credit and default risk is more complex. That is why credit rating agencies' ratings of corporate bonds play such

a crucial role. We also consider the effect on the yield spread of corporate bonds issued by frequent issuers and *Other* issuers respectively, at the bonds' introduction to the secondary market. This tests for the market's reaction to other investors' valuations, as well as how the primary and secondary markets' differences in characteristics affect the post-issue pricing of corporate bonds.

2.2 Literature review

2.2.1 The issuers' incentive to inflate ratings

The research by Leftwich et al. (1992) on the impact of announcements from bond rating agencies, although inconsistent in the results, reports that there are price implications on bonds that are traded on the market following changes in the rating of said bond. They do not consider the primary- but only the secondary market implications. These secondary market price implications can be translated to the primary market as differences in price-at-issue between the hypothetical instances that the same issuance received a higher rating and a lower rating respectively, caeteris paribus. This comparison depends on the primary and secondary markets being interchangeable, however, which is a weak assumption with regard to instance liquidity and investor accessibility.

If you accept that the findings by Leftwich et al. (1992) are transferrable, it is not surprising that firms who issue public debt strive for as high ratings on the bonds as well as the firm. The extent of managers' concern for firm credit ratings supports this claim, and is reported by Graham & Harvey (2001), who found that it is the second highest concern among CFOs in capital structure considerations. They find that the factors indicated to be determinant in traditional capital structure theories – such as the benefits of interest tax deductibility– are ranked lower than credit rating implications, concerning determinants for capital structure considerations. Furthermore, Kisgen (2006) quotes the Barron's article *King of the Cabin* (2003) that reported that Lear Corp. had taken their capital structure in regard by reducing its debt in the pursuit to win an Investment Grade rating for their outstanding bonds, "above their current BB-plus". In this, Barron's provides an example of how corporate bond ratings are affected by the firm's credit rating and, consequently, its leverage.

Additionally, Kisgen names a number of consequences that may follow a rating downgrade of the company; changes in bond coupon rate, a required repurchase of bonds, or limitations on access to the commercial paper market. These implications are transferrable to the conditions associated with corporate bonds' ratings at issue, such as higher requirements on coupon rates (or yields), the inability to issue bonds subject to the same covenants as would have been at a higher rating, and the loss of institutional investors who operate with regulations that limit investments to higher rated securities – such as the Securities Act. Kisgen's research establishes that credit ratings are "significant in the financial market place", and suggests that the firms' credit ratings are largely determinant to the ratings of corporate bonds issued by the same firm. The relationship is supported by Standard & Poor's (2001b), which states that there is a "strong link" between long-term firm-level ratings and the rating of their commercial papers.[1] This statement reportedly still applies, according to the up-to-date S&P Corporate Ratings Criteria.

Related to these findings, Kisgen & Strahan (2010) elaborate on how regulations based on credit ratings affect companies' cost of capital. They find that regulations on bond investments affect yields, which found expression at, for instance, the event of the SEC recognizing the Canadian rating agency Dominion Bond Rating Service (DBRS) as a Nationally Recognized Statistical Ratings Organization (NRSRO). Following the SEC publication of this recognition, bonds rated higher by DBRS than by other NRSROs experienced a significant decline in yields, the reverse was not true, however.[2] The effect being asymmetrical, as described, implies that regulations that limit bond investments to Investment Grade bonds have an impact on yields and consequently the companies' cost of capital. This is further supported by the effect on yields in Kisgen & Strahan's (2010) findings is larger around the Investment Grade bracket cut-off.

[1] Note that commercial papers generally have maturities ranging up to 270 days, as opposed to senior secured debt. The link between corporate credit rating and the rating on an issue of corporate bonds is affected by the nature of the collateral that secures the debt; bonds that are collateralized by relatively illiquid assets, such as Property, Plants & Equipment, may very well have their ratings suffer and be estimated below the company-level credit rating. It is however evident that this relationship – between company credit rating and the rating of their outstanding debt obligations – constitutes a rule, to which there are exceptions such as the previously mentioned example.

[2] Bonds that were rated lower by DBRS than by other NRSROs did not experience a corresponding increase in yields

With respect to the implications on capital structure described by Kisgen (2006), and the impact on companies' cost of capital reported by Kisgen & Strahan (2010), the incentive for corporations to try to gain as high ratings as possible is quite apparent; on a company-level as well as for individual bond issuances under consideration.

As of late, rating agencies have become exposed to a greater degree of competition, however, one might question if the link between the companies' respective credit ratings and the ratings of their bond issuances is as strong as it was made out to be by Standard & Poor's in the statement above. As circumstances have changed, this relationship requires ongoing consideration.

2.2.2 Recent Changes in the Credit Rating Industry

The effect of increased competition among credit rating agencies has been discussed in a number of papers. Becker & Milbourn (2009) find that increased competition from Fitch coincides with less accurate ratings from the incumbents; rating levels went up, the correlation between ratings and market-implied yields fell, and the ability of ratings to predict default worsened. Boot et al. (2006) also show that credit ratings can coordinate investors' beliefs. The conflict of interest originating from credit rating agencies split roles as both monitoring and corporation with contracts to the firm at hand gives ratings real impact. As increased competition occurs in the credit rating industry we see inflated ratings, particularly evident during the recent financial crisis as noted by Griffin & Tang (2010).

A number of papers have been written on rating agency bias due to the "frequent issuer retention conflict", ascertaining that there is indeed a pattern of "rating inflation" based on the volume issued by a client[3]. These findings are, however, exclusive to securities such as mortgage-backed securities and structured debt products where there is an imbalance between how much business each client brings to the rating agencies, and the research on rating bias is lacking in regard to corporate bonds.

[3] See, for example, Strahan et al. (2012), Veldkamp et al. (2009), Frenkel (2015)

2.2.3 Mortgage-Backed Securities

Mark Adelson, in the capacity of Chief Credit Officer at S&P in the years 2008 – 2011 sequential to the crisis, was responsible for the overhaul of the company's rating criteria. His prudence led to a downgrade of 68 % of S&P rated commercial-mortgage securities and led to a reputation of being an authority in credit risk, "wanting the ratings to be bullet-proof". In the words of Joseph Mason, a finance professor at Louisiana State University, the hiring of Adelson showed that Standard & Poor's was the rating agency most determined to rebuilt their reputation following the crisis.

Veldkamp et al. (2008) quote Mark Adelson as follows:

> *A second argument about why many assets were systematically misrated attributes the problem to the increasing complexity of assets. As Mark Adelson testified before Congress:*
> *"The complexity of a typical securitization is far above that of traditional bonds. It is above the level at which the creation of the methodology can rely solely on mathematical manipulations. Despite the outward simplicity of credit-ratings, the inherent complexity of credit risk in many securitizations means that reasonable professionals starting with the same facts can reasonably reach different conclusions."*

The testimony implies that less complex securities such as corporate bonds are not exposed to the same kind of bias, as there is less discretion for rating agencies to willfully misinterpret the risk factors that are intended to be included in the rating. While there are similarities between different asset classes – for instance MBS as discussed by Strahan et al. (2012) – such as being publicly traded and being subject to customized covenants and reservations, the similarities are exceeded by the disparities. Due to these divergences in security characteristics, the comparability between corporate bonds and other securities is largely unsatisfactory.

Furthermore, a major difference is illustrated by the Adelson testimony, which is referenced by Veldkamp et al. (2008). He argues that the complexity of the kind of structured products that MBS pertain to allows for a higher degree of variation in the assessment of the inherent credit risk of the structured product when conducted by able-minded professionals, despite them having access to the same information.

3. Data

To compile the data we have primarily used the TRACE database via Bloomberg, as it contains a wide range of issuances and transactions and thereby best represents the full body of issuances that the study regards. TRACE provides information about the issue date, number of tranches and the issuer. Bloomberg's database was also used to retrieve specific information concerning the particulars of individual issuances and secondary market transactions. We have also gathered data on principal amounts, credit ratings, coupon type, maturity, and yields at issue. The initial dataset includes 5071 issues of U.S. corporate bonds issued between 1/1/2010 and 1/1/2015.

3.1 Data collection

The data of the issuances studied has been collected through the Bloomberg's database, which in turn gathers its data from the Trade Reporting and Compliance Engine (TRACE) under the Financial Industry Regulatory Authority (FINRA). All broker/dealers who are FINRA member firms have an obligation to report transactions in corporate bonds to TRACE under an SEC approved set of rules, which makes TRACE the most comprehensive source of data on transactions and issuances for the regarded period and market. For the initial regression of yield spreads comparing frequent and *Other* issuers data was collected describing the ISIN, coupon, coupon type, issue date, maturity date, issue price, yield at issue, amount, use of proceeds, currency, filing format (such as RegS and SEC rule 144A), and the credit ratings from Moody's S&P and Fitch for each issuance studied. For the second section, examining the aftermarket performance of the issuances, the data includes the price at issue as well as the closing price for the 30 consecutive days for each issuance as identified by their respective ISIN's. The time period from 01/01/2011 to 01/01/2015 was chosen as to reflect the post-crisis US capital markets.

3.2 Adjustments to sample and generated variables

A number of adjustments have been made to the initial dataset as to ensure that the inferences made from the sample output is representative for the population. Most adjustments has been made due to missing values and outliers. This is further discussed in section 3.2.2. The sample used in the regressions consist of a total of 1902 corporate bond issues.

3.2.1 Generated variables

A large portion of the variables used in the study have been generated from our initial dataset. These are described and explained below.

Rating Classes: variables Prime HG (High Grade), UMG (Upper Medium Grade), LMG (Lower Medium Grade), NIGS (Non-Investment Grade Speculative), HS (Highly Speculative), SR (Substantial Risk), ES (Extremely Speculative), IDWLP (Imminent Default with Little Prospect of Recovery)

(Equation 1-9)

$$Rating\ Class(i) = \begin{cases} 0, & Otherwise \\ 1, & Depending\ on\ Rating\ Class\ (Prime, HG, UMG, LMG, NIGS, HS, SR, ES, IDWLP) \end{cases}$$

[Table 1]: *Rating range* variable description

Aaa	Obligations rated Aaa are judged to be of the highest quality, with minimal credit risk.	*Prime*
Aa	Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.	*HG*
A	Obligations rated A are considered upper-medium grade and are subject to low credit risk.	*UMG*
Baa	Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics.	*LMG*
Ba	Obligations rated Ba are judged to have speculative elements and are subject to substantial credit risk.	*NIGS*
B	Obligations rated B are considered speculative and are subject to high credit risk.	*HS*
Caa	Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.	*SR*
Ca	Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.	*ES*
C	Obligations rated C are the lowest rated class of bonds and are typically in default, with little prospect for recovery of principal or interest.	*IDWLP*

To be able to compare ratings accurately between the three credit rating agencies examined (S&P, Moody's and Fitch), dummy variables are generated indicating the rating class and thus the credit risk of each issue. **[Table 1]** above describes which rating range is attributable to the respective variables. As each regression is made by

comparing issuances with the same rating class, these dummy variables are an incremental part of our thesis.

Frequent issuers: variables Frequent & Other

(Equation 10)

$$Top10(i) = \begin{cases} 0, & Otherwise \\ 1, & If\ issuing\ entity\ ranks\ among\ the\ top\ 10\ \%\ most\ frequent\ issuers\ from\ 2010\ to\ 2015 \end{cases}$$

Frequent is defined as the issuances by the top 10 % most frequent issuers during the time period studied. Comparing with previous papers such as Strahan et al. (2012), also studying the effect issuer size on the pricing of securities (in this case mortgage-backed securities), similar variables have been used by generating a lagging variable indicating the issuers' frequency in the capital markets during the previous year. The *Frequent*-variable in this study instead looks indicates the issuer's frequency in the capital markets over the entire time period from 2010 to 2015. 2010 is included to reflect issuer share also for issuances offered in 2011. Taking the entire time period in regard gives a better representation of the relationships between credit agencies and issuing companies, as corporate bond issuers are collectively more sporadic in issuances than those issuing other sorts of structured products such as MBS. Note that the top 10 % of the entire dataset of 5071 issues is maintained, as to not compromise the biasedness of the variable from the adjustments made; missing data on a certain issuance does not imply that the issuance has not taken place. Due to the described procedure in the interest of maintaining the integrity of the data, the share of the adjusted sample of 1902 issuances that was issued by *Frequent* is slightly skewed. The remainder of the sample observations are, for the sake of clarity, referred to as *Other*.

Split ratings: variable Split(class)

(Equation 11)

$$Split(i) = \begin{cases} 0, & Otherwise \\ 1, & Prime_i + HG_i + UMG_i + LMG_i + NIGS_i + HS_i + SR_i + ES_i + IDWLP_i \geq 1.5 \end{cases}$$

Split is a generated dummy variable indicating if there are ratings ranging over several of the rating classes defined 4.2.1.1. This also results in the fact that one issuance can be part of two rating classes at the same time. As not to subjectively decide which credit rating agency should define which rating class an issuance with split rating classes, we choose to allow for these split ratings to be part of several rating classes. This means that even though the adjusted sample consist of 1902 issues, we register 2470 issuances when adding all rating classes together.

Rule 144A: variable Filing

(Equation 12)

$$Filing(i) = \begin{cases} 0, & Otherwise \\ 1, & Issue\ filed\ under\ SEC\ Rule\ 144A \end{cases}$$

Filing is a dummy variable indicating whether the issue at hand has been filed under SEC Rule 144A or not. As investments in issues under rule 144A require "qualified institutional buyers" and previous literature indicate certain characteristics (higher yield spreads of investment grade debt for instance) for these issuances such as Livingston & Zhou (2002), a variable capturing these effects seems appropriate.

Use of Proceeds: variables Acq (Acquisition Financing), GCP (General Corporate Purposes), CE (Capital Expenditures), SB (Share Buyback), RE (Refinance/Repay Debt), Div (Dividend), L (Loan Payment), LBO (LBO-funding), Mer (Merger Financing), CP (Commercial Paper/Short-term Debt Payment)

(Equation 13-22)

$$Use\ of\ Proceeds(i)$$

$$= \begin{cases} 0, & Otherwise \\ 1, & Depending\ on\ Use\ of\ Proceeds\ (Acq, GCP, CE, SB, RE, Div.L, LBO, Mer, CP) \end{cases}$$

These variables have been generated to reflect the miscellaneous use of proceeds for each respective issue, as to examine if certain purposes for the proceeds of the issues has implications for the yield spread and aftermarket trading performance. Also note that the proceeds from the issued bonds can fill several purposes and several issues in the dataset have described more than one use of proceeds.

Tenor: variable Tenor

(Equation 23)

$$Tenor(i) = Length\ of\ Tenor\ in\ years$$

Tenor is a variable controlling for the time until maturity starting from the issue date. The variable is reported in years.

3.2.2 Adjustments

Winsorizing of data and treatment of missing values

A number of adjustments have been made to the original dataset. Many issuances occurred in the original dataset of 5071 issuances miss data for either z-spread (2056 missing observations), or credit ratings missing for one or more the considered rating agencies – this applies to 378 of the issuances in the original dataset. These observations were consequently cleared from the sample, as their contribution to the study is negligible. Before filtering the data, we cleared the dataset of outliers by performing a 95 % winsorization on yield spreads for each rating class defined in section 3.2.1, excluding 256 issuances. In addition, the 479 issuances that passed in 2010 were excluded, as these observations only served to define the *Frequent* variable defined in section 3.2.1. Further discussion regarding the implications of these adjustments is found in section 6.2. The final sample used in the regressions include 1902 issuances.

Rebasing of close price data in aftermarket performance study

The closing prices studied in the aftermarket trading performance section are rebased to 100 to be made percentally comparable, independent of price at issue. For the aftermarket performance tests, the dataset has been cleared for all issuances with more than 13 trading days with missing close price data.

4. Methodology

The study consist of two sections; first we examine the difference in offering yields dependent on issuer size effects, and we then extend the study to the respective aftermarket trading performance, dependent on issuer size effects.

As previously mentioned, in order to keep the number of observations on an acceptable level, we have chosen to develop an alternative to the proxy for "frequent issuers" used in the previous research by Strahan et al. Instead of using a lagging variable of historical issuances on a year-to-year basis, we proxy for recurring issuances by the total number of issuances over the four-year period 1/1/2010 to 1/1/2015. The top 90^{th} percentile is represents the group *Frequent*, the "frequent issuers", which comprises 47.4 % of the total issuances during the time period.

This is a more reasonable proxy in respect to frequent issuances of corporate bonds as the aforementioned lagging variable is in regard to mortgage-backed securities which, as previously mentioned, are far more concentrated to a small number of issuing institutions. Consequently, the study of MBS suffers far less from using the lagging variable – it may even benefit from contrasting changes in issuer retention among rating agencies during the period. In conclusion, corporate bonds are more sparsely issued, which renders the lagging variable relatively gratuitous for our study, cemented by the dilution of issuances among a greater number of issuing institutions.

4.1 Measuring issue yield spreads

(Equation 24)

$$Z - Spread_i = \beta_0 + \beta_1 Top10_i + \beta_2 Amount_i + \beta_3 Split_i + \beta_4 Filing_i + \beta_5 Acq_i + \beta_6 GCP_i + \beta_7 CE_i + \beta_8 SB_i + \beta_9 RE_i + \beta_{10} Div_i + \beta_{11} L_i + \beta_{12} LBO_i + \beta_{13} Mer_i + \beta_{14} CP_i + \beta_{15} Tenor_i + \beta_{16} Curr_i + \beta_{17} EV_i + \varepsilon_i$$

where (i) represents each respective issuance in the Ordinary Least Square regression

This regression is estimated with an OLS regression. The standard errors are robust as to heed any concerns in regards to heteroskedasticity. Equation 24 describes the regression and the results are reported for each rating class respectively.

The intention of this study is to investigate whether or not frequent issuers, the issued amount and firm size are systematically awarded higher ratings. This is tested by examining whether they are forced to offer higher yields than less frequent issuers, to address suspected conflicts of interests among credit rating agencies. Data from 1/1/2011 to 1/1/2015 is examined without regards to the time of the issuance as the Z-spread accounts for both current and projected Treasury yields.

4.2 Measuring aftermarket trading performance

The intention of this study is to investigate whether or not frequent issuers, the issued amount and issuer firm size of corporate bonds are trading at lower levels post-issuance for the 30 first days post-issuance, using a regression outlined in *Equation 25* below:

[Equation 25]

$$Price_{it} = \beta_0 + \beta_1 Top10_{it} + \beta_2 Amount_{it} + \beta_3 Split_{it} + \beta_4 Filing_{it} + \beta_5 Acq_{it} + \beta_6 GCP_{it} + \beta_7 CE_{it} + \beta_8 SB_{it} + \beta_9 RE_{it} + \beta_{10} Div_{it} + \beta_{11} L_{it} + \beta_{12} LBO_{it} + \beta_{13} Mer_{it} + \beta_{14} CP_{it} + \beta_{15} Curr_{it} + \beta_{16} Tenor_{it} + \beta_{17} EV_{it} + a_i + u_{it}$$

$$given\ Cov(x_{itj}, a_i) = 0$$

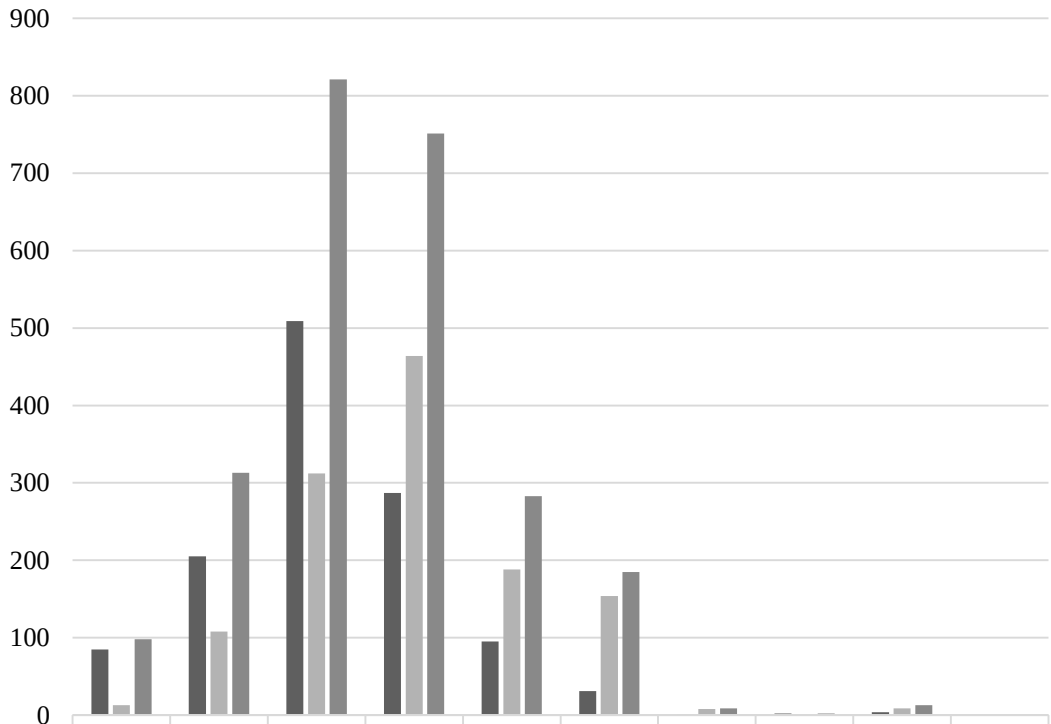
where (i) represents each respective issuance and (t) the day of the closing price

As it is a panel data structure we have used a Generalized Least Square (GLS) Random Effects Model, which should generate robust results. We also considered using a Fixed Effect- or First Difference Model to ensure that there are no time- or issuance- fixed effects. However, as the independent variables in the regression are almost exclusively dummies, and consequently display constant values for each issuance, the results are not subject to these risks. Due to the same reason we were unable to perform any Hausman tests on the regression. Instead, the standard errors are clustered by issuance, which serves to generate more robust results. There will be further discussion elaborating on the robustness of the findings in section 6.5.

5. Results

This section will provide a review of the results of the regressions, and of the descriptive statistics. We conclude the section with an examination of the robustness of our regressions, and a following discussion. We first, however, want to narrow the scope by disregarding the results found for rating classes *Prime* (Aaa), *Substantial Risk* (Caa), *Extremely Speculative* (Ca) and *Imminent Default with Little Prospect* (C) due to the lack of observations which can be seen in the histogram below. As can be seen in the Appendix, it is evident that the findings from issuances within these rating classes hold little to no explanatory value, and we will instead focus on the rating classes *High Grade* (Aa), *Upper Medium Grade* (A), *Lower Medium Grade* (Baa), *Non-Investment Grade Speculative* (Ba) and *Highly Speculative* (B) which together constitute the absolute majority (95,07%) of our dataset. We will still include the results from the excluded rating classes, but the results will not be discussed.

[Graph 1] The graph presents the number of observations in each rating class. The observations are also presented per frequent and other issuers in each respective rating class to display the distribution of the two groups.



	Prime	HG	UMG	LMG	NIGS	HS	SR	ES	IDWLP
Top10	85	205	509	287	95	31	1	2	4
Other	13	108	312	464	188	154	8	0	9
Total	98	313	821	751	283	185	9	2	13

5.1 Descriptive Statistics

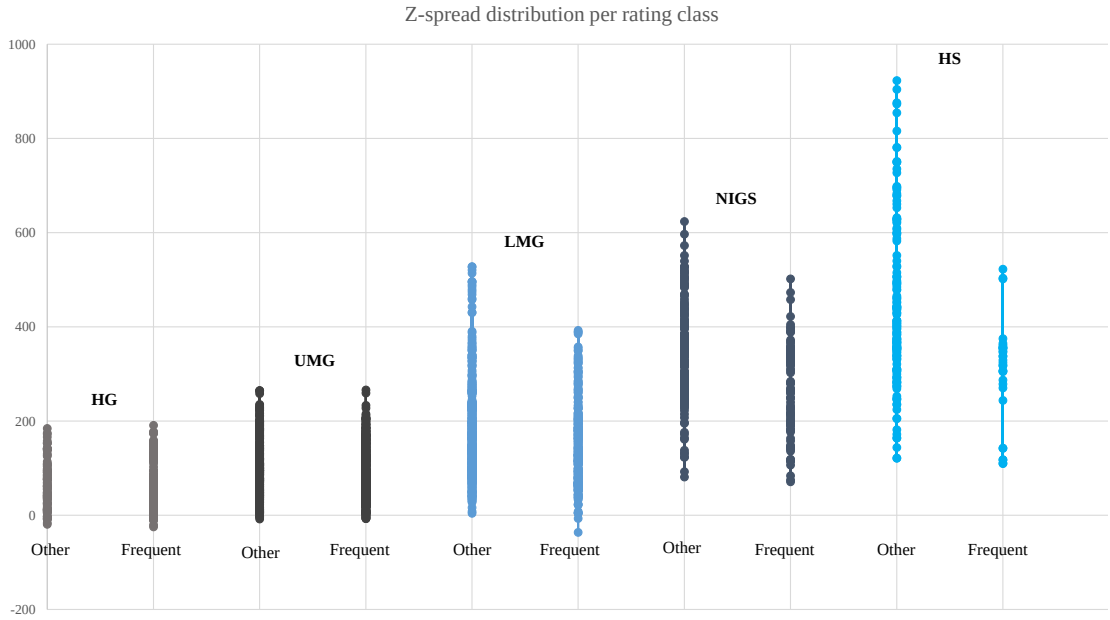
[Table 2] The table presents summary statistics (mean, median, number of observations, standard deviation, minimum and maximum) for the period 2011-2015. Discrete variables reported as Sum and Portion of total in percent, continuous variables reported as Mean(*) and Median(**)

	Descriptive Statistics					
	*Sum/Mean**	*%/Median***	N	Sd	Min	Max
Frequent	902	47,42%	1902	0,50	0	1
Split(class)	568	29,86%	1902	0,46	0	1
Z-Spread	161,69*	121,51**	1902	144,26	-35,96	923,09
Amount	8372*	6000*	1902	7938	635	11000000
Filing	155	8,15%	1902	0,27	0	1
Acquisition	187	9,83%	1902	0,30	0	1
GCP	1040	54,68%	1902	0,50	0	1
Capex	64	3,36%	1902	0,18	0	1
Share Buyback	77	4,05%	1902	0,20	0	1
Refinance Debt	726	38,17%	1902	0,49	0	1
Dividend Payment	53	2,79%	1902	0,16	0	1
Loan Payment	314	16,51%	1902	0,37	0	1
LBO	7	0,37%	1902	0,06	0	1
Merger	35	1,84%	1902	0,13	0	1
CP	141	7,41%	1902	0,26	0	1
EV	127117*	17747**	1004	42905	45	335274
Currency	1768	92,95%	1902	0,26	0	1
Tenor	10,31	9,00	1902	7,91	0	1

Examining the descriptive statistics, we note that 47,42% of the dataset is attributable to frequent issuers. Also noted is that there are not any missing observations for any other variable than *EV* (which represent the firm size of the issuer at issuance). When observing the descriptive statistics, we also see that a high portion of the issuances are made with the purpose to refinance existing debt or to be used for general corporate purposes. In addition, we also observe that the issuances range significantly in the amount issued and enterprise value, which is made evident upon inspecting the standard deviations, minimum and maximum values for these variables. We also see that the absolute majority of the transactions in the sample are in USD.

5.2 Regression on yield spreads

[Graph 2] The graph scatters the Z-spread of the observations in each rating class discussed in Section 5.



Across all rating classes studied, the descriptive statistics share the an equal trend in means for the two variables *Z* and *Amount*. Frequent issuers issuances have, on average, lower Z-spreads and higher principal amount at the time of issue.

The *High Grade* rating class consist of 313 issues, with 108 of those issuances issued by *Other* issuers, and consequently 205 by frequent issuers. When comparing the average Z-spread between the groups, *Other* investors seems to issue at higher spreads than the frequent. One might also note that there seems to be larger issues made by frequent issuers than their counterparts. In terms of the results from the regression, the findings do not find any significant (at $\propto = 0.05$) difference for issuer size effects regarding the yield spread offered at issue.

The *Upper Medium Grade* sample consist 312 issues issued by *Other* issuers and 509 by frequent, totaling 821 issues. The regression shows that there's a significantly negative coefficient on yield spreads among frequent issuers, but not for any other issuer size effect.

The *Lower Medium Grade* sample consist 464 issues issued by *Other* issuers and 287 by frequent, totaling 751 issues. The regression shows that there's a significantly negative coefficient on yield spreads among frequent issuers.

The *Non-Investment Grade Speculative* sample consist 188 issues issued by *Other* issuers and 95 by frequent, totaling 283 issues The regression shows that there's a significantly negative coefficient on yield spreads among frequent issuers

The *Highly Speculative* sample consist 154 issues issued by *Other* issuers and 31 by frequent, totaling 185 issues. The regression shows that there's a significantly negative coefficient on yield spreads among frequent issuers.

During the years 2011 through 2014, we find that yield spreads differ consistently between frequent-issued and other-issued corporate bonds across rating classes *Upper Medium Grade* through *Highly Speculative* with 95 % confidence. *High Grade*, while not statistically significant, have true values in the interval basis points. The findings regarding yield spreads for *High Grade* suggest that they, too, are subject to these biases, but that the number of observations that received ratings corresponding to this rating class are insufficient due to the skewedness of the sample. We do not find any consistent results for our other two variables of size effects, *Amount* and *EV*.

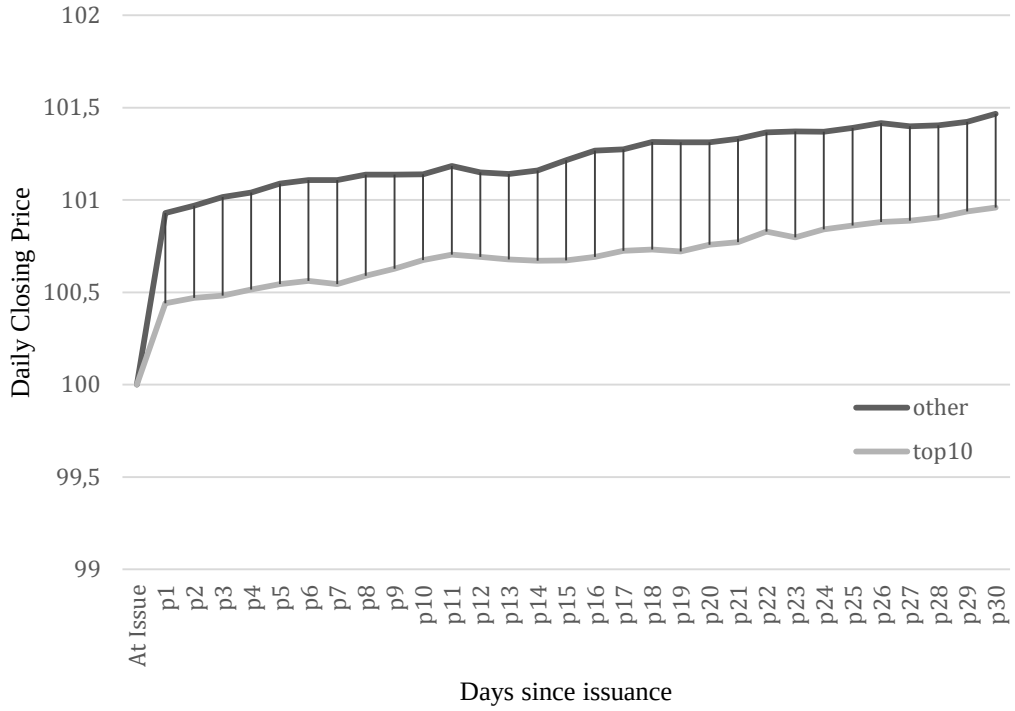
To summarize it appears evident that frequent issuers issue bonds at lower yield spreads than their *Other* counterparts. These results are surprising as they contradict the reasoning and arguments made in our hypothesis. We can thus reject our hypothesis for this test. We will discuss these results and possible explanations further in section 7.

[Table 3] The table presents results of the regression on yield spreads. Each coefficient is reported for each rating class with its robust standard error in parantheses below. *implies p<0,05, ** implies p<0,01 and *** implies p<0,001.

Coefficients per rating class in regression on Z-spread											
		HG		UMG		LMG		NIGS		HS	
Size	*Frequent*	-5,35 (3,29)		-9,6*** (2,88)		-17,24* (7,13)		-69,71*** (13,23)		-99,845*** (29,7)	
	Amount	-9,82e-10 (2,83e-09)		2,73e-09 (1,59e-09)		-4,9e-10 (6,9e-09)		2,17e-08 (1,59e-08)		-1,2e-08 (3,12e-08)	
	Enterprise Value	0,01 (0,01)		-0,01 (0,01)		-0,01 (0,02)		-0,01 (0,03)		0,09 (0,08)	
Use of Proceeds		Frequent	Others	Frequent	Others	Frequent	Others	Frequent	Others	Frequent	Others
	Acquisition	-0,74 (6,97)	-7,17 (8,44)	8,17 (5,88)	7,25 (8,29)	-9,4 (12,22)	21,19 (13,98)	7,6 (53,89)	40,21 (33,73)	91,32 (50,66)	73,01 (53,23)
	GCP	1,24 (4,23)	2,47 (5,81)	-1,84 (3,12)	-1,05 (4,8)	1,48 (8,83)	12,56 (9,08)	-19,67 (18,14)	-24,15 (16,59)	4,60 (61,36)	4,46 (28,07)
	Capex	-0,28 (5,95)	-24,65* (12,05)	-4,93 (5,78)	7,87 (8,93)	-33,78 (17,33)	-9,25 (23,41)	0 (omitted)	-100,13 (55,85)	0 (omitted)	-109,28 (66,41)
	Share Buyback	26,46*** (6,89)	5,1 (20,63)	7,14 (5,66)	11,56 (11,80)	12,46 (19,35)	15,87 (17,19)	3,09 (34,78)	55,11 (38,1)	0 (omitted)	70,63 (46,1)
	Refinance Debt	-2,19 (3,93)	1,11 (5,75)	1,62 (3,26)	6 (5,38)	-4 (8,81)	-2,48 (9,18)	25,51 (19,06)	3,07 (16,07)	-0,22 (44,15)	8,35 (30,95)
	Dividend	-4,07 (8,26)	5,09 (10,58)	-8,54 (8,06)	18,09 (12,08)	2,86 (25,56)	-15,5 (18,19)	20,64 (46,95)	-37,23 (34,75)	0 (omitted)	72,37 (72,64)
	Loan payment	0,97 (5,6)	12,15 (7,25)	-2,25 (4,25)	-0,5 (6,29)	2,31 (12,9)	18,34 (12,93)	4,91 (33,89)	-3,96 (19,25)	30,17 (61,05)	2,93 (33,45)
	LBO	0 (omitted)	0 (omitted)	0 (omitted)	-16,08 (8,5)	0 (omitted)	-31,92 (16,87)	0 (omitted)	0 (omitted)	0 (omitted)	174,07*** (50,85)
	Merger	-25,82** (8,52)	-3,45 (22,64)	-8,23 (12,64)	5,45 (23,89)	2,59 (28,34)	47,28 (31,56)	-22,11 (23,2)	-13,62 (30,88)	-110,48 (94,85)	34,99 (97,45)
	Commercial Paper	-12,58** (4,64)	-0,17 (11,2)	-2,84 (5,52)	-3,77 (8,85)	-8,72 (15,68)	17,76 (19,45)	22,38 (32,76)	44,85 (25,91)	13,55 (79,51)	79,46 (57,88)
Other		Frequent	Others	Frequent	Others	Frequent	Others	Frequent	Others	Frequent	Others
	Split(class)	8,02 (4,98)	19,19* (7,47)	-2,05 (3,6)	15,47** 5,79)	-17,03 (12,48)	-6,51 (11,72)	-25,77 (23,27)	-22,23 (17,56)	-60,1 (75,05)	-84,62* (35,86)
		Frequent	Others	Frequent	Others	Frequent	Others	Frequent	Others	Frequent	Others
	Currency	4,48 (5,31)	29,71*** (8,98)	14,54*** (4,1)	27,37** (10,69)	72,47*** (10,87)	53,17** (16,95)	134,82*** (35,82)	5,6 (71,93)	0 (omitted)	-241,03*** (29,45)
	Tenor	4,69*** (0,22)	5,13*** (0,33)	4,52*** (0,17)	4,48*** (0,26)	4,4*** (0,45)	4,22*** (0,57)	13,85** (4,22)	3,7 (4,09)	-4,96 (16,72)	-11,5 (8,4)
	Filing	15,19 (8,45)	46,51*** (13,15)	-0,75 (8,89)	35,54 (21,2)	67,71*** (17,68)	72,92*** (20,39)	-7,53 (23,43)	-0,34 (18,36)	-36,56 (53,63)	-55,57 (35,43)

5.3 Regression on aftermarket trading performance

Graph 3: Trading performance of bonds issued by the market share top decile of issuers after becoming available on the secondary market. Each observation is rebased to 100.



[Graph 3] above illustrates the price development of bonds for the initial days after introduction to the secondary market, split into issuances by *Frequent* and *Other* respectively. As shown, the first day of trading is where the development significantly differs, immediately converging to fairly equal appreciation pattern until day 30 after issuance. During the years 2011 through 2014, we find that initial trading performance differ consistently between corporate bonds issued by *Frequent* and *Other* across rating classes *Upper Medium Grade* through *Non-Investment Grade Speculative* with 95 % confidence. *High Grade'*s and *Highly Speculative*'s differences are statistically insignificant. *Amount* displays significantly positive coefficients in *Upper Medium Grade* and *Non-Investment Grade Speculative.* We also note that a longer tenor and proceeds used to finance acquisitions seems to perform better in the aftermarket. These results are consistent with our expectations and previous literature.

Coefficients per rating class in regression on aftermarket trading performance							
	Variable	**Total**	HG	UMG	LMG	NIGS	HS
Size	*Frequent*	**-0.49*** (0.08)**	0.06 (0.15)	-0.35*** (.11)	-0.56*** (0.12)	-0.79*** (0.21)	-0.45 (0.42)
	Amount	**1.12e-10 (6.96e-11)**	-3.39e-11 (1.12e-10)	3.86e-10*** (1.09e-10)	9.92e-11 (1.06e-10)	5.53e-10* (2.25e-10)	4.20e-10 (3.59e-10)
	Enterprise Value	**0.00028 (0.00021)**	0.00016 (0.00042)	-.00031 (.00029)	0.00055 (0.00034)	0.00088 (0.00058)	-0.00065 (0.00096)
Use of Proceeds	*Acquisition*	**0.23* (0.11)**	0.38* (0.18)	0.34* (0.14)	0.4 (0.21)	-0.03 (0.4)	-0.3 (0.62)
	GCP	**0.014 (0.07)**	0.14 (0.15)	0.01 (0.1)	-0.09 (0.11)	-0.03 (0.2)	0.27 (0.3)
	Capex	**-0.004 (0.18)**	-0.40 (0.43)	0.3 (0.27)	-0.15 (0.25)	0.61 (0.56)	0.19 (0.4)
	Share Buyback	**0.03 (0.15)**	0.26 (0.21)	-0.15 (0.23)	-0.04 (0.22)	0.21 (0.47)	-0.05 (0.50)
	Refinance Debt	**0.026 (0.07)**	0.02 (0.14)	-0.01 (0.1)	-0.02 (0.11)	0.31 (0.2)	-0.06 (0.3)
	Dividend	**-0.006 (0.17)**	0.65* (0.3)	0.21 (0.2)	0.13 (0.27)	0.14 (0.38)	-1.9* (0.84)
	Loan payment	**-0.09 (0.09)**	-0.04 (0.16)	0.01 (0.13)	-0.07 (0.15)	0.00 (0.29)	-0.26 (0.32)
	LBO	**-0.34 (0.71)**	0 (omitted)	0.05 (0.15)	-0.12 (0.81)	0 (omitted)	0.23 (0.46)
	Merger	**0.22 (0.25)**	0.12 (0.43)	0.12 (0.3)	0.42 (0.4)	0.23 (0.71)	0.47 (0.76)
	Commercial Paper	**0.07 (0.14)**	-0.24 (0.26)	-0.02 (0.17)	0.14 (0.21)	-0.43 (0.39)	0.13 (0.54)
Other							
	Split(class)	**-0.09 (0.08)**	0.1 (0.17)	-0.22* (0.11)	-0.26 (0.14)	0.06 (0.22)	0.1 (0.37)
	Currency	**0.21 (0.12)**	0.00 (0.19)	-0.03 (0.13)	0.24 (0.26)	0.64 (0.34)	2.47*** (0.39)
	Tenor	**0.03*** (0.01)**	0.05*** (0.01)	0.04*** (0.01)	0.03* (0.01)	-0.08* (0.04)	0.06 (0.08)
	Filing	**0.19 (0.14)**	0.71 (0.66)	0.29 (0.15)	-0.02 (0.18)	-0.28 (0.25)	0.34 (0.4)

[Table 4] The table presents results of the regression on initial trading performance. Each coefficient is reported for each rating class with its robust standard error in parantheses below.
*implies p<0,05, ** implies p<0,01 and *** implies p<0,001.

5.3 Robustness tests

As mentioned previously we use a Generalized Least Squares Random Effects Model with clustered robust standard errors per issue instead of a fixed effect or first difference model as the absolute majority of the independent variables are dummies. This was determined after performing a Lagrange Multiplier test which indicated we should use a panel data regression method. As the majority of independent variables are discrete, a fixed effect or first difference method is not applicable and the regression is therefore performed with a Generalized Least Square random effects method with clustered-robust standard errors. We may therefore face serial correlation and the key assumption of our model for assessing aftermarket trading performance would then not be as robust. Therefore we test for collinearity (see Appendix section 9.2), which reports a mean VIF-score 1.09.

This indicates that the independent variables do not correlate to a consequential extent. Testing for collinearity (see section 8) in the regression of yield spreads as well, we obtain a mean VIF-score of 1.12, rejecting possibility of collinearity issuances in the dataset. Using Wooldridge's test for autocorrelation in panel data,[4] we also tested the random effects model for serial correlation and found that serial correlation is not an issue in our random effects model, likely resulting from the use of cluster-robust standard errors. Our tests of normality (performed with a Jarque-Bera test) exhibit similar results; although our variables display some skewness, it is not significant enough to foil our results.

[4] *Testing for serial correlation in linear panel-data models*, Drukker, D. M. 2003. Stata Journal 3: 168–177

6. Discussion

6.1 Implications of Results

Our results show that there are issuer size effects benefiting frequent issuers in the credit rating process as they consistently are able to offer issuances at lower yields than their counterparts. We do, however, find a reverse effect once the bond is traded on the secondary market, where issuances issued by non-frequent issuers consistently outperform their counterparts in the 30 first day post-issuance.

The data on corporate bonds' yield spreads at issue does not support the idea presented in previous comparable research; that the market immediately adjusts for expected rating inflation. Quite the opposite, the yield spreads are consistently at statistically significant levels below those pertaining to the control group which indicates a higher degree of trust in rating agencies' assessment of corporate bond credit risk. In contrast, the tendency for MBS is that the market compensates for expected rating inflation of tranches issued by large issuers. Strahan et al. (2012) report that this results in yield spreads about 10 % higher than tranches with comparable ratings that were issued by small issuers.

As reported in section 8, bonds belonging in rating classes *UMG* through *HS* issued by *Frequent* achieve lower yields than those issued by *Other* in the same rating class. This difference is reversed directly when the bonds become available on the secondary market.

While the findings of aftermarket trading performance are limited to rating classes *UMG* through *HS*, these rating classes constitute more than 80 % of the adjusted sample observations. It is more appropriate to limit the tests to the better represented rating classes. We can also speculate that the lower the rating, the more significant discrepancy of issuer size effects as we can observe greater differences in yield spreads in the lower rating classes.

As the sample is adequate, the results indicates the rather surprising characteristic among the primary market participants, that they have a higher degree of trust in the credit ratings assigned to corporate bonds issued by *Frequent* companies not to be inflated, than the secondary market participants. This indication is intriguing, as the

investors who have access to the primary market on a meaningful scale are predominantly institutional.

With respect to these investors' professional nature, we deem it a strong assumption that they are better informed than their secondary market counterparts, who constitute household investors to a – not high compared to the share of institutional aftermarket investors, but to a higher degree than at issue. The results, then, suggest that better informed investors exhibit a higher degree of confidence in corporate bond credit ratings and, in extension, in rating agencies' integrity during the rating process, than supposedly less informed investors.

Strahan's et al. (2012) findings pertaining to the same mechanics, but with respect to mortgage-backed securities, report the opposite behavior after becoming open to trade. The findings are especially surprising as the aftermarket price development does not simply lack support in one of the outputs, but that the results are statistically significant and report diametrically opposed behaviors. This might be assignable to the different periods of time that the respective papers focus on, as a potential consequence of loss of credibility in the public's opinion. The effect is, however, much too large in both cases, as public distrust in credit ratings following the financial crisis would have a marginal impact due to the limited share of corporate bonds that are held by non-institutional investors.

A possible explanation for why we see the results given from our regressions, would be a case of reversed causality of the two variables *top10* and *Z*. We have presumed that the lower yields at issue would be caused by these issuers' frequency in the capital markets. It is however possible that the reason why they are so frequent, simply is due to the fact that they manage to achieve such low yield spreads due to effects not controlled for in our regressions. However, the frequency cannot be explained only by considering reversed causality as it doesn't offer an explanation why these issuer's would offer new credit on the market over and over again. We do, however, realize that this is a potential explanatory factor to our results and acknowledge it as such.

A second potential explanation for the opposing aftermarket price reactions, which is arguably more plausible, is that it is attributable to the origination of the issuances. Corporate bond issuances are generally designed and facilitated by financial advisory

firms; to a large extent the same big investment banks that issued MBS in the years leading up to the "subprime crisis". There is, in other words, an additional party involved during the process of issuing corporate bonds, and this additional party faces a similar situation as the rating agencies – an incentive to retain frequent issuers by offering higher value than other originators who compete for the recurring issuers' business. This, in theory, creates a situation where originators are rewarded for making the value added from becoming a frequent customer as high as possible; incentivizing them to redirect their efforts to frequent issuers and consequently underperform in the issuances of more sporadic customers (relative their performance with no such incentives, caeteris paribus). This second explanation is coherent and structurally logical. The scenario is, however, dependent on a number of assumptions that – however stringent and reasonable they may be separately – accumulate uncertainty that undermines the idea. Secondly there is also a significant reputation effect in the originator industry, which discredits the view that this would be the cause of our findings. This is, however, an interesting notion, and would be an intriguing topic for future research, building on the contribution made by these findings.

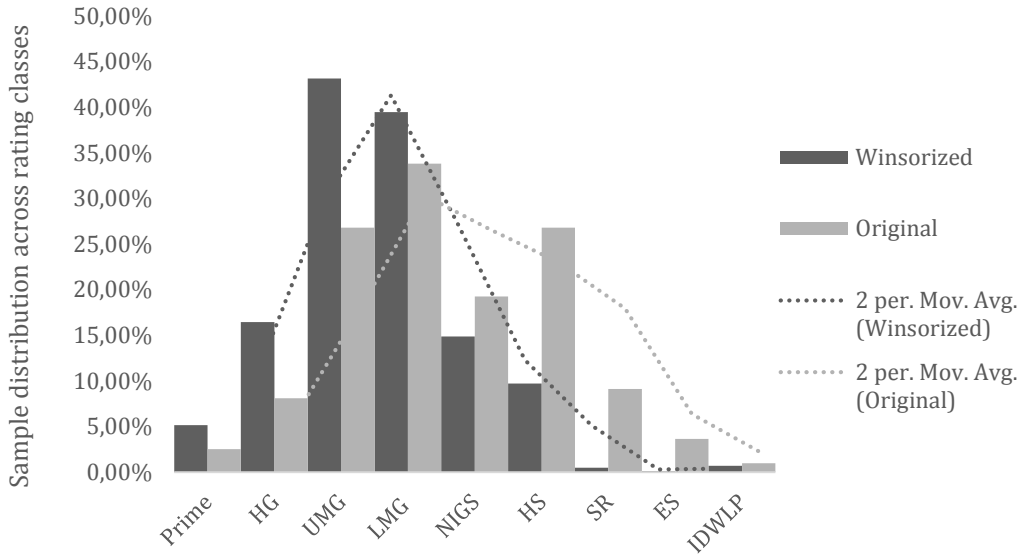
6.2 Problematization

6.2.1 Data selection

As neither Standard & Poor's, Moody's or Fitch provide credit ratings for corporate bonds exclusively, there may be instances in the dataset where issuing companies are receiving benefits that are not accounted for as a consequence of other operations and services that provide business for the rating agencies. Frequent transactions of a different nature with one or more rating agencies are unlikely to be exempt from the benefits pertaining to *Frequent*. It is, despite this consideration, unlikely that the potential implications for the results in this study would be sufficient to corrupt the findings and have a meaningful impact on the merits of our conclusions.

As mentioned in the previous section 3.2, regarding adjustments made to the raw dataset, a number of calibrations have been made to better portray the actual circumstances. To address the issue of a potential selection bias, a comparison follows below of the sample used in the regressions (1902 issues) and the original dataset (5071 issues).

Graph 4: Comparing the distribution of observations across rating classes between the dataset in its original extent and after winsorizing shows that the sample in large is slightly shifted toward the higher rating class brackets, due to frequent issuers'



[Graph 4] displays the number of observations in each dataset per each rating class as a percentage of the total dataset. What can be noted is that the sample used in the regressions tends to be a bit skewed towards higher ratings. This can be explained by the higher portion of frequent issuers (47.42 % in the sample used in the regressions, compared to 35.81 % in the original dataset) which tends to have higher ratings as noted in the distribution graph from section 5. As we, in the regressions, only compare issues with other issues in the same rating class, however, this shift should not be of significance to the output.

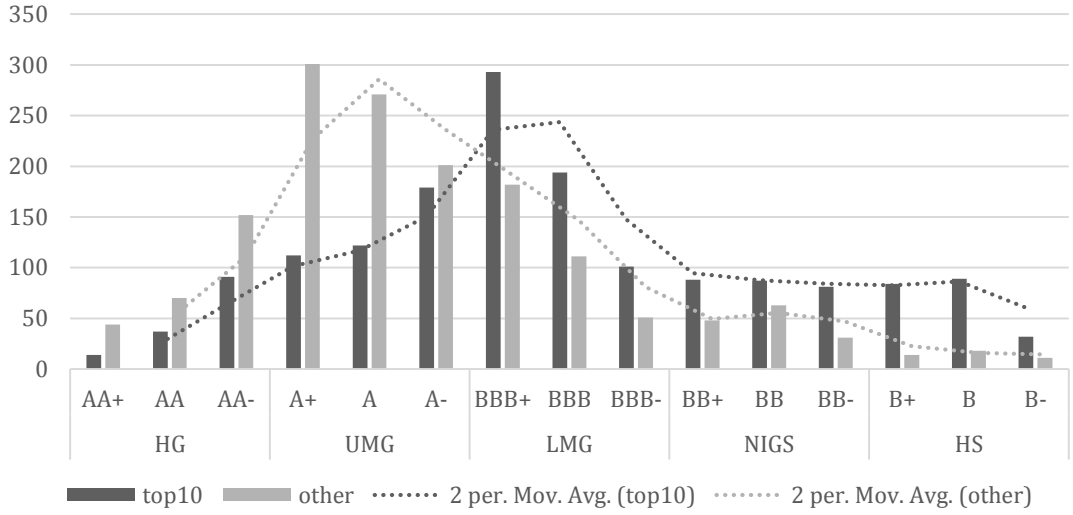
[Table 5]: Exhibit of descriptive statistics comparing entire retrieved dataset with adjusted sample used in regressions. Discrete variables reported as Sum and Portion of total in percent, continuous variables reported as Mean(*) and Median(**).

	1902 issues		5071 issues	
	*Sum/Mean**	*%Median***	*Sum/Mean**	*%Median***
Issue date	2013-07-20	2013-08-17	2013-05-09	2013-05-15
Frequent	902	47.42 %	1816	35.81 %
Prime	98	5.15 %	127	2.50 %
HG	313	16.46 %	410	8.09 %
UMG	821	43.17 %	1360	26.82 %
LMG	751	39.48 %	1716	33.84 %
NIGS	283	14.88 %	976	19.25 %
HS	185	9.73 %	1359	26.80 %
SR	9	0.47 %	462	9.11 %
ES	2	0.11 %	184	3.63 %
IDWLP	13	0.68 %	49	0.97 %
Split(class)	568	29.86 %	1565	30.86 %
Z-Spread	161.69*	121.51**	277.07*	152.19**
Amount	8372*	6000**	6219*	4805**
144A	155	8.15 %	1306	25.75 %
Acquisition Financing	187	9.83 %	560	11.04 %
GCP	1040	54.68 %	2753	54.29 %
Capital Expenditures	64	3.36 %	175	3.45 %
Share Buyback	77	4.05 %	205	4.04 %
Repay/Refinance Debt	726	38.17 %	1942	38.30 %
Dividend Payment	53	2.79 %	144	2.84 %
Loan Payment	314	16.51 %	856	16.88 %
LBO Funding	7	0.37 %	25	0.49 %
Merger Financing	35	1.84 %	91	1.79 %
CP/Short-term Debt	141	7.41 %	370	7.30 %
EV	127117*	17747**	112726*	18063**
Currency	1768	92.95 %	4851	95.66 %
Tenor	10.31	9.00	10.38	8.02

[Table 5] presented above compares the differences between the two datasets for each variable included in the regressions (Sum/% for discrete variables and Mean/Median for continuous variables). Note that the higher portion of frequent issuers in the sample used in the regressions, is evident in the table above as well. Higher amounts and ratings, fewer filings under the Securties Act amendment Rule 144A and longer tenors are all evident in the sample used in the dataset. We do not, however, consider these discrepancies as too concerning given the fact that we only compare issuances within a given rating class. As we can see in **[Graph 5]** on the next page, there are differences

in distribution, but no consistency in trends within rating classes we do not suspect any significant bias in our used sample.

[Graph 5]: The distribution of observations expanded upon by comparing within rating classes the exact ratings distribution.



6.2.2 Methodology

A potential error source is the choice of proxy for the market share of the issuer, in the choice of which we have deviated from previous research to better represent corporate bonds. With regard to asset class, we deem it more appropriate to consider the whole time period as issuances are more sporadic as a consequence of the higher extent of dilution following the difference in market conditions. To address the potential challenging of the relevance of our results, we have performed the tests with respect to the dataset using both a lagging variable and our chosen "share of total" as the proxy for market share. As shown in the histogram in section 5. *Results,* the results confirm the notion that this does not distort the output, but serves to better accentuate the essential parts of our contribution.

6.3 Conditions under which subjectivity is evident in the rating process

The results from our study may exhibit a difference in credit risk assessment by the primary market and secondary market. As issues issued by *Frequent* consistently offer lower yields at issue, and also consistently is outperformed in the secondary market by issuances issued by *Other*, one can suspect unfailing information asymmetry between the primary and the secondary market. But why, and maybe more importantly how?

Bolton et al. (2011) create a model to determine under which conditions rating inflation is most likely to occur. They find that the less of a reputation effect affecting credit rating agencies combined with the more trust investors have for the ratings, the more likely rating inflation is to occur. So if our findings are true to the population, one or both of these factors are more significant for the primary market than the secondary; either the primary market punish credit rating agencies less for lack of accuracy, or they trust the ratings more (or both). Similar findings, with discrepancies between primary and secondary market performance of debt securities derived from information asymmetry, has been found previously, for example by Datta et al. (1997) and Wittenberg-Moerman (2008). Further studies regarding discrepancies between primary and secondary market performance would be of interest.

7. Conclusions

Our findings regarding issuer size effects dependent on credit are robust and display significant issuer size effects. Thus, we have shown that previous research on issuance frequency related rating bias extends to U.S. corporate bonds in addition to the securities for which this connection has previously been established.

Our findings on the discrepancies between the yield spreads for corporate bonds issued by *Frequent*, and to a lesser extent those issued by the control group, between the primary market and the secondary market are evident, as shown by the price development immediately post-issue. While the direction of the yield curve development is diametrical to that reported by Strahan et al. (2012), the results are not in conflict. Due to the previously mentioned bond-MBS divergences; the allocation of observations across the rating scale, the complexity of the securitization, and the concentration of issuing institutions, it is not unreasonable that reports of implied market reactions relative the primary market investors differ as well.

Although it is possible that the reactions are completely unrelated, the seemingly mirrored impact of being subject to relatively free trade – and consequently the exposure to active speculation – raises further questions about the circumstances facing the respective securities. Elaborating on the impact of considerations such as differences between primary- and secondary market performance, issuer concentration, or originator biases would be interesting topics for future research.

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8. Tables

[Table 6] The table presents results of the regression on initial trading performance on the total 1902 issues. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

Regression on Initial Trading Performance (Total)						
Variable	Coef.	Robust sd	z	P>z	95% Conf.Interval	
Frequent	-0,48873	0,075843	-6,44	0	-0,63738	-0,34008
Amount	1,12E-10	6,96E-11	1,6	0,109	-2,5E-11	2,48E-10
ev	0,000278	0,0002079	1,33	0,182	-0,00013	0,000685
Split	0,100477	0,0847849	1,19	0,236	-0,0657	0,266652
Splitclass	-0,09478	0,0834187	-1,14	0,256	-0,25828	0,068718
Filing	0,185891	0,1446885	1,28	0,199	-0,09769	0,469475
Acquisition	0,229902	0,1134617	2,03	0,043	0,007521	0,452283
GCP	0,013705	0,0703303	0,19	0,845	-0,12414	0,15155
Capex	-0,00447	0,1827254	-0,02	0,98	-0,3626	0,353669
SB	0,02978	0,1560138	0,19	0,849	-0,276	0,335562
Repay	0,026158	0,0701577	0,37	0,709	-0,11135	0,163664
Div	-0,00586	0,1685864	-0,03	0,972	-0,33628	0,324568
Loan	-0,09429	0,0926012	-1,02	0,309	-0,27579	0,087205
LBO	-0,34475	0,7134596	-0,48	0,629	-1,74311	1,053605
Merger	0,217238	0,2531792	0,86	0,391	-0,27898	0,71346
CP	0,065751	0,1377249	0,48	0,633	-0,20419	0,335686
Curr	0,206808	0,1171698	1,77	0,078	-0,02284	0,436456
Tenor	0,033	0,0058966	5,6	0	0,021443	0,044558
_cons	100,3607	0,1575819	636,88	0	100,0518	100,6696
R-sq	0,0495					
N of Obs	1902					

[Table 7] The table presents frequently used terms throughout the paper with the actual name of the term used as well as a description of its meaning.

Term descriptions		
Designation	*Label*	*Description*
Top10	Frequent issuers	Companies in top 10 % of bond issuances 1/1/2010 - 1/1/2015
Other	Issuers that are not frequent	Companies not in top 10 % of bond issuances 1/1/2010 - 1/1/2015
MBS	Mortgage-Backed Securities	A structured product with mortgage-related underlying assets
TRACE	Trade Reporting and Compliance Engine	Database to which FINRA member firms are required to report transaction details in accordance with SEC-approved set of rules
FINRA	Financial Industry Regulatory Authority	Largest independent regulator for securities firms operating in the U.S., acts as a self-regulatory organization
NRSRO	Nationally Recognized Statistical Ratings Organization	A ratings organization that meets SECs requirements for financial firms to be permitted to use the organization's credit ratings within the regulatory framework
QIB	Qualified Institutional Buyer	"purchaser of securities deemed financially sophisticated, legally recognized to need less protection from issuers"
Securities Act	The Securities Act of 1933	Enacted after the '29 stock market crash, effectively requiring any trading in securities to be registered with the SEC, unless there is an exception from registration under the law.
RegS	Regulation S of the Securities Act, defines "Safe Harbors" from SEC registration requirements	Defines the circumstances for when an offering is made outside of the U.S., and thereby excempt from registration with the SEC
Rule 144A	Amendment to the Securities Act, excempting "certain private resales of minimum $500,000 to QIBs"	Has greatly increased liquidity of affected securities, as QIBs can trade formerly regulated secuities freely among themselves
ISIN	International Securities Identification Number	Code uniquely identifying a specific securities issue provided by each country's National Numbering Agency.
Z-Spread	Zero-volatility Spread	The constant spread that will make the price of a security equal to the present value of its cash flows when added to the yield at each point on the spot rate Treasury curve where a cash flow is received.
Prime	Aaa	Obligations rated Aaa are judged to be of the highest quality, with minimal credit risk.
HG	Aa	Obligations rated Aa are judged to be of high quality and are subject to very low credit risk
UMG	A	Obligations rated A are considered upper-medium grade and are subject to low credit risk.
LMG	Baa	Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics.
NIGS	Ba	Obligations rated Ba are judged to have speculative elements and are subject to substantial credit risk.
HS	B	Obligations rated are considered speculative and are subject to high credit risk.
SR	Caa	Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.
ES	Ca	Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.
IDWLP	C	Obligations rated C are the lowest rated class of bonds and are typically in default, with little prospect for recovery of principal or interest.

[Table 8] The table presents summary statistics by rating class for the rating classes considered in section 5 through 7. The statistics are presented in total, and split by variable *top10*.Discrete variables are presented as Sum and continuous as Mean.

	HG			UMG			LMG			NIGS			HS		
	Total	*Other*	*Frequent*	*Total*	*Other*	*Frequent*	*Total*	*Other*	*Frequent*	*Total*	*Other*	*Frequent*	*Total*	*Other*	*Frequent*
Average of Issue date	2013-07-13	2013-06-10	2013-07-31	2013-08-11	2013-07-22	2013-08-22	2013-07-08	2013-05-30	2013-09-08	2013-08-24	2013-08-07	2013-09-26	2013-07-12	2013-07-18	2013-06-12
Average of Z	59,1	65,2	55,8	93,7	103,8	87,5	168,0	178,1	151,7	317,7	344,3	265,0	419,4	442,5	304,9
Average of Amount	963987373	870239074	1013376720	861133819	677921770	973436686	722792369	608652565	907325016	740178030	641099750	936248733	593210186	563064184	742967742
Average of EV	146692	169183	134219	138525	133497	141826	119366	127338	104943	117283	93166	169188	101834	111186	53200
Sum of 144A	4	3	1	25	8	17	65	39	26	65	43	22	42	36	6
Sum of Curr	275	105	170	737	302	435	718	453	265	278	184	94	184	153	31
Average of Tenor	9,9	10,6	9,5	11,6	12,2	11,2	11,0	11,1	10,8	8,1	8,4	7,5	7,6	7,7	7,4
Sum of CP	24	6	18	66	21	45	57	34	23	20	17	3	14	10	4
Sum of Merger	7	3	4	13	5	8	16	9	7	9	5	4	4	3	1
Sum of LBO	0	0	0	1	1	0	5	5	0	0	0	0	1	1	0
Sum of Loan	53	20	33	129	53	76	120	78	42	48	30	18	34	25	9
Sum of Dividend	9	4	5	24	8	16	22	11	11	9	7	2	4	4	0
Sum of Refinance Debt	122	36	86	304	117	187	291	180	111	110	72	38	74	66	8
Sum of Share Buyback	11	2	9	31	9	22	33	17	16	13	10	3	7	7	0
Sum of Capex	16	3	13	27	6	21	27	14	13	4	4	0	2	2	0
Sum of GCP	151	55	96	427	174	253	440	264	176	165	111	54	109	90	19
Sum of Acquisition	37	9	28	84	42	42	64	42	22	24	15	9	16	14	2
Sum of Split(class)	190	45	145	362	142	220	313	155	158	155	103	52	75	60	15
Sum of top10	205	0	205	509	0	509	287	0	287	95	0	95	31	0	31

[Table 9] The table presents results of the regression on initial trading performance on the 98 issuances that pertain to the rating class *Prime*. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

PRIME												
Regression on Z-Spread							Regression on Initial Trading Performance					
Variable	Coef.	Robust sd	t	P>t	95% Conf.Interval		Variable	Coef.	Robust sd	z	P>z	95% Conf.Interval	
Frequent	-17,63	8,02	-2,20	0,03	-33,60	-1,67	*Frequent*	0,14	0,36	0,39	0,69	-0,56	0,84
Amount	-4,3E-09	1,57E-09	-2,75	0,007	-7,5E-09	-1,2E-09	*Amount*	5,49E-11	4,91E-11	1,12	0,264	-4,1E-11	1,51E-10
ev	-0,00139	0,0165681	-0,08	0,933	-0,03436	0,031584	*ev*	-0,00049	0,000971	-0,5	0,616	-0,00239	0,001416
Split	-29,94	9,62	-3,11	0,00	-49,09	-10,79	*Split*	-1,23	0,36	-3,45	0,00	-1,93	-0,53
Splitclass	21,09	7,35	2,87	0,01	6,46	35,71	*Splitclass*	1,04	0,31	3,38	0,00	0,44	1,65
Filing	0,00	(omitted)	0,00	0,00	0,00	0,00	*Filing*	0,00	(omitted)	0,00	0,00	0,00	0,00
Acquisition	-11,25	7,03	-1,60	0,11	-25,24	2,74	*Acquisition*	-0,01	0,45	-0,02	0,98	-0,89	0,87
GCP	-12,02	4,48	-2,68	0,01	-20,93	-3,11	*GCP*	0,02	0,15	0,15	0,88	-0,27	0,32
Capex	7,57	8,07	0,94	0,35	-8,50	23,63	*Capex*	0,07	0,18	0,37	0,71	-0,29	0,43
SB	-15,83	6,54	-2,42	0,02	-28,84	-2,83	*SB*	0,20	0,31	0,66	0,51	-0,40	0,81
Repay	2,86	4,33	0,66	0,51	-5,76	11,48	*Repay*	-0,14	0,14	-0,96	0,34	-0,41	0,14
Div	0,00	(omitted)	0,00	0,00	0,00	0,00	*Div*	0,00	(omitted)	0,00	0,00	0,00	0,00
Loan	1,94	5,12	0,38	0,71	-8,25	12,12	*Loan*	0,19	0,26	0,73	0,46	-0,32	0,69
LBO	24,58	10,20	2,41	0,02	4,27	44,88	*LBO*	-3,07	0,39	-7,89	0,00	-3,83	-2,30
Merger	-22,79	10,96	-2,08	0,04	-44,59	-0,98	*Merger*	-0,28	0,23	-1,22	0,22	-0,74	0,17
CP	7,61	5,78	1,32	0,19	-3,90	19,12	*CP*	0,42	0,23	1,85	0,07	-0,03	0,88
Curr	1,51	4,86	0,31	0,76	-8,17	11,18	*Curr*	0,07	0,18	0,40	0,69	-0,29	0,43
Tenor	5,98	0,99	6,05	0,00	4,01	7,95	*Tenor*	0,01	0,05	0,22	0,82	-0,08	0,10
_cons	32,34	16,49	1,96	0,05	-0,47	65,15	*_cons*	101,07	0,51	198,97	0,00	100,08	102,07
R-sq	0,7049						*R-sq*	0,2001					
N of Obs	98						*N of Obs*	98					

[Table 10-11] The tables below present the summary statistics in tests performed to control for multicollinearity. To the left, tests are performed on variables used in regression on Z-spreads, and to the right on variables used in regression on initial trading performance.

Multicollinearity Test Z-spread regression				
Variable	VIF	VIF	Tolerance	Squared
Z	1,31	1,14	0,764	0,236
top10	1,25	1,12	0,8005	0,1995
Amount	1,15	1,07	0,8706	0,1294
ev	1,03	1,02	0,9698	0,0302
Split	1,45	1,2	0,6896	0,3104
Splitclass	1,34	1,16	0,7474	0,2526
Filing	1,09	1,04	0,9162	0,0838
Acquisition	1,03	1,01	0,9713	0,0287
GCP	1,08	1,04	0,9241	0,0759
Capex	1,06	1,03	0,9468	0,0532
SB	1,06	1,03	0,9391	0,0609
Repay	1,02	1,01	0,9818	0,0182
Div	1,05	1,02	0,9554	0,0446
Loan	1,02	1,01	0,9774	0,0226
LBO	1,01	1,01	0,9878	0,0122
Merger	1,02	1,01	0,9802	0,0198
CP	1,07	1,04	0,9324	0,0676
Curr	1,09	1,04	0,9188	0,0812
Tenor	1,06	1,03	0,9423	0,0577
Mean VIF	1,11526316			

Multicollinearity Test Initial Trading Performance				
Variable	VIF	VIF	Tolerance	Squared
p	1,05	1,03	0,9505	0,0495
top10	1,2	1,09	0,8365	0,1635
Amount	1,13	1,06	0,8832	0,1168
ev	1,03	1,02	0,9697	0,0303
Split	1,44	1,2	0,6945	0,3055
Splitclass	1,34	1,16	0,7475	0,2525
Filing	1,05	1,02	0,9543	0,0457
Acquisition	1,03	1,02	0,9699	0,0301
GCP	1,08	1,04	0,9251	0,0749
Capex	1,05	1,03	0,949	0,051
SB	1,06	1,03	0,9422	0,0578
Repay	1,02	1,01	0,9822	0,0178
Div	1,05	1,02	0,9555	0,0445
Loan	1,02	1,01	0,9772	0,0228
LBO	1,01	1,01	0,9881	0,0119
Merger	1,02	1,01	0,98	0,02
CP	1,07	1,04	0,9325	0,0675
Curr	1,07	1,04	0,9308	0,0692
Tenor	1,05	1,02	0,9519	0,0481
Mean VIF	1,093158			

[Table 12] The table presents results of the regression on initial trading performance on the 313 issuances that pertain to the rating class *High Grade*. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

HIGH GRADE												
Regression on Z-Spread							**Regression on Initial Trading Performance**						
Variable	Coef.	Robust sd	t	P>t	95% Conf.Interval		Variable	Coef.	Robust sd	z	P>z	95% Conf.Interval	
Frequent	-5,35	3,29	-1,63	0,11	-11,82	1,13	*Frequent*	0,06	0,15	0,39	0,70	-0,23	0,34
Amount	-9,8E-10	2,83E-09	-0,35	0,729	-6,6E-09	4,59E-09	*Amount*	-3,4E-11	1,12E-10	-0,3	0,762	-2,5E-10	1,85E-10
ev	0,012876	0,0098264	1,31	0,191	-0,00646	0,032215	*ev*	0,000163	0,0004154	0,39	0,695	-0,00065	0,000977
Split	-8,83	5,01	-1,76	0,08	-18,69	1,03	*Split*	-0,59	0,23	-2,58	0,01	-1,03	-0,14
Splitclass	14,26	3,85	3,71	0,00	6,69	21,82	*Splitclass*	0,10	0,17	0,58	0,56	-0,23	0,43
Filing	39,46	14,79	2,67	0,01	10,35	68,58	*Filing*	0,71	0,66	1,07	0,29	-0,59	2,01
Acquisition	-2,41	5,04	-0,48	0,63	-12,32	7,51	*Acquisition*	0,38	0,18	2,15	0,03	0,03	0,73
GCP	1,17	3,35	0,35	0,73	-5,42	7,77	*GCP*	0,14	0,15	0,88	0,38	-0,17	0,44
Capex	-5,44	5,40	-1,01	0,31	-16,07	5,19	*Capex*	-0,40	0,43	-0,93	0,35	-1,25	0,44
SB	22,87	7,24	3,16	0,00	8,63	37,11	*SB*	0,26	0,21	1,22	0,22	-0,16	0,67
Repay	-1,35	3,10	-0,44	0,66	-7,47	4,76	*Repay*	0,02	0,14	0,13	0,89	-0,26	0,29
Div	-0,92	6,82	-0,14	0,89	-14,35	12,51	*Div*	0,65	0,30	2,19	0,03	0,07	1,23
Loan	2,93	4,23	0,69	0,49	-5,40	11,25	*Loan*	-0,04	0,16	-0,25	0,80	-0,36	0,28
LBO	0,00	(omitted)	0,00	0,00	0,00	0,00	*LBO*	0,00	(omitted)	0,00	0,00	0,00	0,00
Merger	-9,89	12,09	-0,82	0,41	-33,68	13,90	*Merger*	0,12	0,43	0,28	0,78	-0,72	0,96
CP	-8,21	4,54	-1,81	0,07	-17,15	0,74	*CP*	-0,24	0,27	-0,91	0,36	-0,76	0,28
Curr	6,98	4,93	1,41	0,16	-2,73	16,69	*Curr*	0,00	0,19	-0,01	1,00	-0,37	0,37
Tenor	4,88	0,17	27,94	0,00	4,53	5,22	*Tenor*	0,05	0,01	3,66	0,00	0,02	0,08
_cons	4,74	8,25	0,57	0,57	-11,49	20,97	*_cons*	100,38	0,34	296,50	0,00	99,71	101,04
R-sq	0,7264						*R-sq*	0,1135					
N of Obs	313						*N of Obs*	313					

[Table 13] The table presents results of the regression on the 821 issuances that pertain to the rating class *Upper Medium Grade*. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

UPPER MEDIUM GRADE													
Regression on Z-Spread							Regression on Initial Trading Performance						
Variable	Coef.	Robust sd	t	P>t	95% Conf.Interval		Variable	Coef.	Robust sd	z	P>z	95% Conf.Interval	
Frequent	-9,60	2,88	-3,33	0,00	-15,26	-3,94	*Frequent*	-0,35	0,11	-3,22	0,00	-0,56	-0,14
Amount	2,73E-09	1,59E-09	1,71	0,087	-4E-10	5,86E-09	*Amount*	3,86E-10	1,09E-10	3,53	0	1,72E-10	6E-10
ev	-0,01085	0,0074743	-1,45	0,147	-0,02552	0,003821	*ev*	-0,00031	0,0002862	-1,08	0,278	-0,00087	0,000251
Split	13,88	3,33	4,17	0,00	7,35	20,40	*Split*	0,07	0,13	0,50	0,62	-0,19	0,33
Splitclass	4,00	3,10	1,29	0,20	-2,08	10,08	*Splitclass*	-0,22	0,11	-1,96	0,05	-0,44	0,00
Filing	11,34	9,59	1,18	0,24	-7,49	30,18	*Filing*	0,29	0,15	1,90	0,06	-0,01	0,59
Acquisition	7,19	5,11	1,41	0,16	-2,85	17,22	*Acquisition*	0,34	0,14	2,36	0,02	0,06	0,62
GCP	-2,62	2,71	-0,96	0,34	-7,94	2,71	*GCP*	0,01	0,10	0,11	0,92	-0,18	0,20
Capex	-3,72	4,86	-0,77	0,44	-13,27	5,82	*Capex*	0,30	0,27	1,12	0,26	-0,22	0,83
SB	10,53	5,37	1,96	0,05	-0,01	21,07	*SB*	-0,15	0,23	-0,66	0,51	-0,60	0,30
Repay	2,93	2,86	1,02	0,31	-2,69	8,55	*Repay*	-0,01	0,10	-0,07	0,95	-0,20	0,19
Div	1,11	7,53	0,15	0,88	-13,67	15,90	*Div*	0,21	0,20	1,03	0,30	-0,19	0,60
Loan	-2,06	3,61	-0,57	0,57	-9,13	5,02	*Loan*	0,01	0,13	0,11	0,91	-0,25	0,28
LBO	-6,52	4,99	-1,31	0,19	-16,30	3,27	*LBO*	0,05	0,15	0,36	0,72	-0,24	0,34
Merger	-2,13	12,43	-0,17	0,86	-26,53	22,27	*Merger*	0,12	0,30	0,41	0,68	-0,46	0,71
CP	-4,24	4,77	-0,89	0,37	-13,60	5,12	*CP*	-0,02	0,17	-0,14	0,89	-0,37	0,32
Curr	17,14	3,98	4,30	0,00	9,32	24,96	*Curr*	-0,03	0,13	-0,27	0,79	-0,28	0,21
Tenor	4,52	0,14	32,40	0,00	4,25	4,79	*Tenor*	0,04	0,01	5,16	0,00	0,02	0,05
_cons	18,36	6,42	2,86	0,00	5,75	30,97	*_cons*	100,25	0,21	475,37	0,00	99,84	100,67
R-sq	0,5883						*R-sq*	0,0799					
N of Obs	821						*N of Obs*	821					

[Table 14] The table presents results of the regression on the 751 issuances that pertain to the rating class *Lower Medium Grade*. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

LOWER MEDIUM GRADE													
Regression on Z-Spread							Regression on Initial Trading Performance						
Variable	Coef.	Robust sd	t	P>t	95% Conf.Interval		Variable	Coef.	Robust sd	z	P>z	95% Conf.Interval	
Frequent	-17,24	7,13	-2,42	0,02	-31,24	-3,24	*Frequent*	-0,56	0,12	-4,86	0,00	-0,79	-0,34
Amount	-4,9E-10	6,9E-09	-0,07	0,943	-1,4E-08	1,31E-08	*Amount*	9,92E-11	1,06E-10	0,93	0,351	-1,1E-10	3,08E-10
ev	-0,00599	0,0177193	-0,34	0,735	-0,04078	0,028798	*ev*	0,000549	0,0003256	1,69	0,092	-9E-05	0,001187
Split	4,69	7,78	0,60	0,55	-10,59	19,97	*Split*	0,20	0,15	1,34	0,18	-0,09	0,48
Splitclass	-8,60	8,27	-1,04	0,30	-24,84	7,64	*Splitclass*	-0,26	0,14	-1,85	0,07	-0,54	0,02
Filing	68,55	14,53	4,72	0,00	40,04	97,07	*Filing*	-0,02	0,18	-0,10	0,92	-0,36	0,33
Acquisition	12,35	9,76	1,27	0,21	-6,81	31,51	*Acquisition*	0,40	0,21	1,92	0,06	-0,01	0,80
GCP	8,24	6,44	1,28	0,20	-4,40	20,88	*GCP*	-0,09	0,11	-0,83	0,41	-0,31	0,13
Capex	-22,32	15,43	-1,45	0,15	-52,62	7,98	*Capex*	-0,15	0,25	-0,62	0,54	-0,63	0,33
SB	16,60	13,14	1,26	0,21	-9,20	42,39	*SB*	-0,04	0,22	-0,17	0,87	-0,47	0,40
Repay	-1,53	6,44	-0,24	0,81	-14,18	11,12	*Repay*	-0,02	0,11	-0,23	0,82	-0,24	0,19
Div	-6,69	15,37	-0,44	0,66	-36,86	23,48	*Div*	0,13	0,27	0,49	0,62	-0,40	0,66
Loan	13,40	9,44	1,42	0,16	-5,13	31,92	*Loan*	-0,07	0,15	-0,50	0,62	-0,37	0,22
LBO	-34,10	14,17	-2,41	0,02	-61,92	-6,28	*LBO*	-0,12	0,81	-0,14	0,89	-1,69	1,46
Merger	22,71	20,75	1,09	0,27	-18,02	63,44	*Merger*	0,42	0,40	1,07	0,29	-0,35	1,20
CP	8,91	13,09	0,68	0,50	-16,80	34,61	*CP*	0,14	0,21	0,65	0,52	-0,28	0,56
Curr	69,70	9,62	7,25	0,00	50,82	88,58	*Curr*	0,24	0,26	0,94	0,35	-0,26	0,75
Tenor	4,20	0,37	11,32	0,00	3,47	4,92	*Tenor*	0,03	0,01	3,11	0,00	0,01	0,04
_cons	66,30	22,75	2,91	0,00	21,64	110,96	*_cons*	100,48	0,27	368,33	0,00	99,95	101,02
R-sq	0,5883						*R-sq*	0,0629					
N of Obs	751						*N of Obs*	751					

[Table 15] The table presents results of the regression on the 283 issuances that pertain to the rating class *Non-Investment Grade Speculative*. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

NON-INVESTMENT GRADE SPECULATIVE												
Regression on Z-Spread							**Regression on Initial Trading Performance**						
Variable	Coef.	Robust sd	t	P>t	95% Conf.Interval		Variable	Coef.	Robust sd	z	P>z	95% Conf.Interval	
Frequent	-69,71	13,23	-5,27	0,00	-95,76	-43,66	*Frequent*	-0,79	0,21	-3,67	0,00	-1,21	-0,37
Amount	2,17E-08	1,59E-08	1,36	0,174	-9,7E-09	5,31E-08	*Amount*	5,53E-10	2,25E-10	2,45	0,014	1,11E-10	9,95E-10
ev	-0,00105	0,0349581	-0,03	0,976	-0,06988	0,067786	*ev*	0,000884	0,0005769	1,53	0,125	-0,00025	0,002015
Split	16,55	18,78	0,88	0,38	-20,44	53,53	*Split*	0,72	0,31	2,30	0,02	0,10	1,33
Splitclass	-18,48	13,44	-1,38	0,17	-44,93	7,98	*Splitclass*	0,06	0,22	0,28	0,78	-0,37	0,50
Filing	-0,94	14,48	-0,07	0,95	-29,46	27,58	*Filing*	-0,28	0,25	-1,13	0,26	-0,76	0,20
Acquisition	27,63	27,24	1,01	0,31	-26,01	81,26	*Acquisition*	-0,03	0,40	-0,08	0,94	-0,81	0,75
GCP	-22,41	12,44	-1,80	0,07	-46,90	2,09	*GCP*	-0,03	0,20	-0,17	0,87	-0,43	0,36
Capex	-95,44	57,72	-1,65	0,10	-209,09	18,20	*Capex*	0,61	0,56	1,10	0,27	-0,48	1,71
SB	39,92	32,16	1,24	0,22	-23,41	103,26	*SB*	0,21	0,47	0,45	0,65	-0,71	1,14
Repay	8,46	12,24	0,69	0,49	-15,65	32,57	*Repay*	0,31	0,20	1,56	0,12	-0,08	0,71
Div	-19,85	28,50	-0,70	0,49	-75,96	36,27	*Div*	0,14	0,38	0,36	0,72	-0,61	0,89
Loan	3,80	16,46	0,23	0,82	-28,61	36,20	*Loan*	0,00	0,29	0,01	1,00	-0,57	0,57
LBO	0,00	(omitted)	0,00	0,00	0,00	0,00	*LBO*	0,00	(omitted)	0,00	0,00	0,00	0,00
Merger	-31,89	19,84	-1,61	0,11	-70,95	7,16	*Merger*	0,23	0,71	0,32	0,75	-1,17	1,62
CP	37,70	22,83	1,65	0,10	-7,26	82,66	*CP*	-0,43	0,39	-1,08	0,28	-1,19	0,34
Curr	28,88	61,30	0,47	0,64	-91,83	149,58	*Curr*	0,64	0,34	1,86	0,06	-0,04	1,31
Tenor	9,18	1,87	4,91	0,00	5,50	12,86	*Tenor*	-0,08	0,04	-2,03	0,04	-0,15	0,00
_cons	208,31	66,46	3,13	0,00	77,46	339,16	*_cons*	100,32	0,59	171,15	0,00	99,17	101,47
R-sq	0,2415						*R-sq*	0,0820					
N of Obs	283						*N of Obs*	283					

[Table 16] The table presents results of the regression on the 185 issuances that pertain to the rating class *Highly Speculative*. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

HIGHLY SPECULATIVE													
Regression on Z-Spread							**Regression on Initial Trading Performance**						
Variable	Coef.	Robust sd	t	P>t	95% Conf.Interval		Variable	Coef.	Robust sd	z	P>z	95% Conf.Interval	
Frequent	-99,85	29,70	-3,36	0,00	-158,48	-41,21	*Frequent*	-0,45	0,42	-1,06	0,29	-1,28	0,38
Amount	-1,2E-08	3,12E-08	-0,39	0,7	-7,4E-08	4,96E-08	*Amount*	4,2E-10	3,59E-10	1,17	0,242	-2,8E-10	1,12E-09
ev	0,086068	0,0829118	1,04	0,301	-0,07764	0,24978	*ev*	-0,00065	0,0009605	-0,67	0,501	-0,00253	0,001236
Split	-6,65	36,12	-0,18	0,85	-77,96	64,66	*Split*	0,08	0,38	0,21	0,84	-0,67	0,83
Splitclass	-78,26	31,44	-2,49	0,01	-140,35	-16,17	*Splitclass*	0,10	0,37	0,27	0,79	-0,63	0,82
Filing	-60,28	29,76	-2,03	0,04	-119,04	-1,53	*Filing*	0,34	0,40	0,84	0,40	-0,45	1,12
Acquisition	79,42	48,47	1,64	0,10	-16,29	175,13	*Acquisition*	-0,30	0,62	-0,48	0,63	-1,52	0,92
GCP	4,66	24,34	0,19	0,85	-43,40	52,72	*GCP*	0,27	0,30	0,92	0,36	-0,31	0,85
Capex	-108,49	53,92	-2,01	0,05	-214,95	-2,03	*Capex*	0,19	0,40	0,48	0,63	-0,59	0,97
SB	76,63	48,59	1,58	0,12	-19,31	172,57	*SB*	-0,05	0,50	-0,11	0,91	-1,04	0,93
Repay	8,27	26,40	0,31	0,75	-43,85	60,39	*Repay*	-0,06	0,30	-0,21	0,83	-0,65	0,52
Div	77,85	70,79	1,10	0,27	-61,94	217,63	*Div*	-1,90	0,84	-2,27	0,02	-3,54	-0,26
Loan	-4,65	27,90	-0,17	0,87	-59,75	50,45	*Loan*	-0,26	0,32	-0,81	0,42	-0,88	0,36
LBO	189,66	44,40	4,27	0,00	102,00	277,33	*LBO*	0,23	0,46	0,51	0,61	-0,67	1,14
Merger	43,69	69,11	0,63	0,53	-92,78	180,16	*Merger*	0,47	0,76	0,62	0,53	-1,02	1,96
CP	18,63	46,98	0,40	0,69	-74,13	111,39	*CP*	0,13	0,54	0,24	0,81	-0,93	1,19
Curr	-245,49	26,51	-9,26	0,00	-297,83	-193,15	*Curr*	2,47	0,39	6,40	0,00	1,72	3,23
Tenor	-9,38	7,28	-1,29	0,20	-23,76	5,00	*Tenor*	0,06	0,08	0,73	0,47	-0,10	0,22
_cons	743,36	75,51	9,84	0,00	594,26	892,45	*_cons*	98,16	0,95	102,81	0,00	96,28	100,03
R-sq	0,2721						*R-sq*	0,0917					
N of Obs	185						*N of Obs*	185					

[Table 17] The table presents results of the regression on the 9 issuances that pertain to the rating class *Substantial Risk*. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

SUBSTANTIAL RISK												
Regression on Z-Spread							**Regression on Initial Trading Performance**						
Variable	Coef.	Robust sd	t	P>t	95% Conf.	Interval	Variable	Coef.	Robust sd	z	P>z	95% Conf.	Interval
Frequent	0,00	(omitted)	0,00	0,00	0,00	0,00	*Frequent*	0,00	(omitted)	0,00	0,00	0,00	0,00
Amount	6,05E-08	,	,	,	,	,	*Amount*	1,71E-08	3,93E-21	4,40E+12	1,71E-08	1,71E-08	0
ev	-0,20418	,	,	,	,	,	*ev*	-0,31601	1,84E-14	-1,70E+13	-0,31601	-0,31601	0
Split	0,00	(omitted)	0,00	0,00	0,00	0,00	*Split*	31,94	0,00	2,00E+13	31,94	31,94	0,00
Splitclass	0,00	(omitted)	0,00	0,00	0,00	0,00	*Splitclass*	0,00	(omitted)	0,00	0,00	0,00	0,00
Filing	0,00	(omitted)	0,00	0,00	0,00	0,00	*Filing*	0,00	(omitted)	0,00	0,00	0,00	0,00
Acquisition	22,81	,	,	,	,	,	*Acquisition*	5,07	1,96E-12	2,60E+12	5,07	5,07	0,00
GCP	-198,69	,	,	,	,	,	*GCP*	22,03	0,00	1,50E+13	22,03	22,03	0,00
Capex	208,19	,	,	,	,	,	*Capex*	10,90	1,80e-12	6,10E+12	10,90	10,90	0,00
SB	0,00	(omitted)	0,00	0,00	0,00	0,00	*SB*	0,00	(omitted)	0,00	0,00	0,00	0,00
Repay	-77,50	,	,	,	,	,	*Repay*	-4,51	1,14e-12	-4,00E+12	-4,51	-4,51	0,00
Div	0,00	(omitted)	0,00	0,00	0,00	0,00	*Div*	0,00	(omitted)	0,00	0,00	0,00	0,00
Loan	0,00	(omitted)	0,00	0,00	0,00	0,00	*Loan*	0,00	(omitted)	0,00	0,00	0,00	0,00
LBO	0,00	(omitted)	0,00	0,00	0,00	0,00	*LBO*	0,00	(omitted)	0,00	0,00	0,00	0,00
Merger	0,00	(omitted)	0,00	0,00	0,00	0,00	*Merger*	0,00	(omitted)	0,00	0,00	0,00	0,00
CP	0,00	(omitted)	0,00	0,00	0,00	0,00	*CP*	0,00	(omitted)	0,00	0,00	0,00	0,00
Curr	0,00	(omitted)	0,00	0,00	0,00	0,00	*Curr*	0,00	(omitted)	0,00	0,00	0,00	0,00
Tenor	21,48	,	,	,	,	,	*Tenor*	7,00	0,00	2,10E+13	7,00	7,00	0,00
_cons	390,19	,	,	,	,	,	*_cons*	0,00	(omitted)	0,00	0,00	0,00	0,00
R-sq	1,0000						*R-sq*	0,8302					
N of Obs	9						*N of Obs*	9					

[Table 18] The table presents results of the regression on the 2 issuances that pertain to the rating class *Extremely Speculative*. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

EXTREMELY SPECULATIVE												
Regression on Z-Spread							**Regression on Initial Trading Performance**						
Variable	Coef.	Robust sd	t	P>t	95% Conf.Interval		Variable	Coef.	Robust sd	z	P>z	95% Conf.Interval	
Frequent	0,00	(omitted)	0,00	0,00	0,00	0,00	*Frequent*	0,00	(omitted)	0,00	0,00	0,00	0,00
Amount	0	(omitted)	0	0	0	0	*Amount*	3,04E-07	3,80E-22	8,00E+14	0	3,04E-07	3,04E-07
ev	0	(omitted)	0	0	0	0	*ev*	-2,9E-16	3,19E-16	-9,20E-01	0,358	-9,2E-16	3,32E-16
Split	0,00	(omitted)	0,00	0,00	0,00	0,00	*Split*	0,00	(omitted)	0,00E+00	0,00	0,00	0,00
Splitclass	0,00	(omitted)	0,00	0,00	0,00	0,00	*Splitclass*	0,00	(omitted)	0,00	0,00	0,00	0,00
Filing	0,00	(omitted)	0,00	0,00	0,00	0,00	*Filing*	0,00	(omitted)	0,00	0,00	0,00	0,00
Acquisition	0,00	(omitted)	0,00	0,00	0,00	0,00	*Acquisition*	0,00	(omitted)	0,00E+00	0,00	0,00	0,00
GCP	0,00	(omitted)	0,00	0,00	0,00	0,00	*GCP*	0,00	(omitted)	0,00E+00	0,00	0,00	0,00
Capex	0,00	(omitted)	0,00	0,00	0,00	0,00	*Capex*	0,00	(omitted)	0,00E+00	0,00	0,00	0,00
SB	0,00	(omitted)	0,00	0,00	0,00	0,00	*SB*	0,00	(omitted)	0,00	0,00	0,00	0,00
Repay	0,00	(omitted)	0,00	0,00	0,00	0,00	*Repay*	0,00	(omitted)	0,00E+00	0,00	0,00	0,00
Div	0,00	(omitted)	0,00	0,00	0,00	0,00	*Div*	0,00	(omitted)	0,00	0,00	0,00	0,00
Loan	0,00	(omitted)	0,00	0,00	0,00	0,00	*Loan*	0,00	(omitted)	0,00	0,00	0,00	0,00
LBO	0,00	(omitted)	0,00	0,00	0,00	0,00	*LBO*	0,00	(omitted)	0,00	0,00	0,00	0,00
Merger	0,00	(omitted)	0,00	0,00	0,00	0,00	*Merger*	0,00	(omitted)	0,00	0,00	0,00	0,00
CP	0,00	(omitted)	0,00	0,00	0,00	0,00	*CP*	0,00	(omitted)	0,00	0,00	0,00	0,00
Curr	0,00	(omitted)	0,00	0,00	0,00	0,00	*Curr*	0,00	(omitted)	0,00	0,00	0,00	0,00
Tenor	0,00	(omitted)	0,00	0,00	0,00	0,00	*Tenor*	0,00	(omitted)	0,00E+00	0,00	0,00	0,00
_cons	110,20	,	,	,	,	,	*_cons*	0,00	(omitted)	0,00	0,00	0,00	0,00
R-sq	0,0000						*R-sq*	0,0000					
N of Obs	2						*N of Obs*	2					
-													

[Table 19] The table presents results of the regression on the 13 issuances that pertain to the rating class *Imminent Default With Little Prospect of Recovery*. For each variable the coefficient, the robust standard error, z-value, P>z and a 95% confidence interval is reported. At the bottom, the R-square and number of observations are noted

IMMINENT DEFAULT WITH LITTLE PROSPECT OF RECOVERY													
Regression on Z-Spread							**Regression on Initial Trading Performance**						
Variable	Coef.	Robust sd	t	P>t	95% Conf.Interval		Variable	Coef.	Robust sd	z	P>z	95% Conf.Interval	
Frequent	-62,58	6,79	-9,21	0,01	-91,80	-33,35	*Frequent*	1,94	0,36	5,44	0,00	1,24	2,63
Amount	2,03E-08	9,36E-09	2,17	0,162	-2E-08	6,06E-08	*Amount*	-1,4E-09	4,71E-10	-2,88E+00	0,004	-2,3E-09	-4,3E-10
ev	0,03108	0,0061927	5,02	0,037	0,004435	0,057725	*ev*	-0,00093	2,79E-04	-3,34E+00	0,001	-0,00148	-0,00038
Split	0,00	(omitted)	0,00	0,00	0,00	0,00	*Split*	0,00	(omitted)	0,00E+00	0,00	0,00	0,00
Splitclass	0,00	(omitted)	0,00	0,00	0,00	0,00	*Splitclass*	0,00	(omitted)	0,00	0,00	0,00	0,00
Filing	0,00	(omitted)	0,00	0,00	0,00	0,00	*Filing*	0,00	(omitted)	0,00	0,00	0,00	0,00
Acquisition	0,00	(omitted)	0,00	0,00	0,00	0,00	*Acquisition*	0,00	(omitted)	0,00E+00	0,00	0,00	0,00
GCP	15,19	7,00	2,17	0,16	-14,92	45,30	*GCP*	0,48	0,15	3,13E+00	0,00	0,18	0,78
Capex	0,00	(omitted)	0,00	0,00	0,00	0,00	*Capex*	0,00	(omitted)	0,00E+00	0,00	0,00	0,00
SB	0,00	(omitted)	0,00	0,00	0,00	0,00	*SB*	0,00	(omitted)	0,00	0,00	0,00	0,00
Repay	-22,52	4,86	-4,63	0,04	-43,45	-1,59	*Repay*	-0,56	0,21	-2,68E+00	0,01	-0,97	-0,15
Div	-1,43	7,99	-0,18	0,87	-35,79	32,93	*Div*	-1,33	0,72	-1,84	0,07	-2,75	0,09
Loan	-30,51	7,92	-3,85	0,06	-64,59	3,57	*Loan*	-0,60	0,15	-3,92	0,00	-0,90	-0,30
LBO	0,00	(omitted)	0,00	0,00	0,00	0,00	*LBO*	0,00	(omitted)	0,00	0,00	0,00	0,00
Merger	-11,39	8,15	-1,40	0,30	-46,47	23,70	*Merger*	0,40	0,16	2,50	0,01	0,09	0,71
CP	0,00	(omitted)	0,00	0,00	0,00	0,00	*CP*	0,00	(omitted)	0,00	0,00	0,00	0,00
Curr	0,00	(omitted)	0,00	0,00	0,00	0,00	*Curr*	100,07	0,20	489,49	0,00	99,66	100,47
Tenor	8,52	0,77	11,07	0,01	5,21	11,83	*Tenor*	-0,06	0,02	-2,49E+00	0,01	-0,10	-0,01
_cons	-41,30	10,42	-3,96	0,06	-86,12	3,52	*_cons*	0,00	(omitted)	0,00	0,00	0,00	0,00
R-sq	0,9950						*R-sq*	0,6442					
N of Obs	13						*N of Obs*	13					