The Issuer-Pays Rating Model and Ratings Inflation: Evidence from Corporate Credit Ratings*

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Abstract

This paper provides evidence that the conflict of interest caused by the issuer-pays rating model leads to inflated corporate credit ratings. Comparing the ratings issued by Standard & Poor's Ratings Services (S&P) which follows this business model to those issued by the Egan-Jones Rating Company (EJR) which does not, we demonstrate that the difference between the two is more pronounced when S&P's conflict of interest is particularly severe: firms with more short-term debt, a newly appointed CEO or CFO, and a lower percentage of past bond issues rated by S&P are significantly more likely to receive a rating from S&P that exceeds their rating from EJR. However, we find no evidence that these variables are related to corporate bond yield spreads, which suggests that investors may be unaware of S&P's incentive to issue inflated credit ratings.

JEL classification: D82, G24

Keywords: Corporate credit ratings; Issuer-pays rating model; Ratings inflation

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1 Introduction

Many market observers have accused credit rating agencies of having contributed to the recent financial crisis by having been too lax in the ratings of some structured products. The picture that has emerged in the press is one in which rating agencies compromised the quality of their activities to facilitate the selling of their services. This behavior has been attributed to an inherent conflict of interest in the agencies' business model: rating agencies receive their principal revenue stream from issuers whose products they rate ("issuer-pays model"). Rating agencies have responded to this accusation by arguing that such an attitude would put their reputation, which is arguably their most valuable asset, at risk and would therefore irrevocably damage their business in the long run. The objective of this paper is to empirically investigate whether reputational concerns are sufficient to prevent rating agencies from issuing inflated credit ratings.

We address this question by comparing the credit ratings issued by two different rating agencies, Standard & Poor's Ratings Services (S&P) and Egan-Jones Rating Company (EJR). Unlike S&P (and other major rating agencies) whose ratings are paid for by issuers, EJR relies on subscription fees paid by investors as its principal source of income ("investor-pays model"). To the extent that investors value accurate ratings, this alternative business model eliminates EJR's incentive to shade its ratings upwards so as to keep issuers happy, making them an ideal benchmark for identifying any bias in S&P's ratings.

Although S&P and EJR use the same categories for their credit ratings (AAA to D for long-term ratings and A-1 to D for short-term ratings), one might argue that their meaning is potentially different. A higher (i.e., closer to AAA) rating from S&P may thus not be an indication of ratings inflation, but simply reflect differences in the agencies' rating methodology. Rather than comparing S&P's ratings directly to those of EJR, our strategy is therefore to identify circumstances under which the conflict of interest caused by the issuer-pays model is particularly severe and to compare the difference in ratings between S&P and

EJR in these circumstances to that when S&P's incentives for issuing inflated ratings are weak (difference-in-difference approach).

Our first proxy for the severity of S&P's conflict of interest is the amount of the issuer's short-term debt. The idea is that the greater the firm's short-term liquidity needs, the more likely it is to issue large amounts of debt in the near future, and thus the more business S&P can obtain from the firm in the future. The prospect of earning additional rating fees gives S&P an incentive to issue a favorable rating so as to attract the firm's future business and forestall the firm's taking its business to another rating agency. Our empirical results provide strong support for this hypothesis: firms with more short-term debt are significantly more likely to receive a rating from S&P that exceeds their rating from EJR.

Our second set of results are related to S&P's market share. In particular, we examine how S&P's revenue share, defined as the volume-weighted percentage of bond issues rated by S&P over the past 2, 4, 6, or 8 quarters, affects the difference between S&P's and EJR's rating. We conjecture that a lower revenue share increases S&P's incentive to produce issuer-friendly ratings so as to attract more business in the future. Consistent with this conjecture, we find that the difference in ratings between S&P and EJR is significantly negatively related to S&P's revenue share.

Our third set of tests are motivated by the observation that newly appointed corporate leaders are more inclined to change the firm's operational and financial strategy (e.g., Giambatista, Rowe, and Riaz, 2005), and may therefore also be more likely to switch credit rating agencies. We hypothesize that S&P may thus have a particularly strong desire to please its customers by issuing favorable ratings for firms that recently appointed a new CEO or a new CFO. Our empirical results provide partial support for this hypothesis. While the appointment of both a new CEO and a new CFO are associated with a bigger difference between S&P's and EJR's rating, the effect is only statistically significant for CFOs.

To gauge the economic significance of our results, we convert S&P's credit ratings into

cumulative default rates based on historical default rates from 1981 to 2007.[1] We find that a one standard deviation increase in a firm's short-term debt is associated with a 47 basis points decrease in the difference in default rates implied by S&P's and EJR's rating. In comparison, the average difference in implied default rates is 102 basis points. Similarly, a one standard deviation increase in S&P's revenue share over the past 4 quarters results in a 45 basis points decrease in the difference in implied default rates. The appointment of a new CFO decreases the difference by 87 basis points.

While our findings indicate that the conflict of interest associated with the issuer-pays model leads to a significant amount of ratings inflation, it is not clear whether it leads to any misallocation of resources. If investors anticipate the bias in S&P's ratings, the firm's debt will be correctly priced and inflated credit ratings may not be harmful to society. To address this issue, we examine whether our variables that predict the extent of S&P's ratings inflation can also predict a bond's yield spread at issuance. We find no evidence that this is the case. The amount of a firm's short-term debt, S&P's past revenue share, and the appointment of a new CEO/CFO have no significant effect on the bond's yield spread. These findings are consistent with the view that investors are unaware of S&P's incentive to issue inflated credit ratings.

Our study adds to a growing literature on incentive problems of credit rating agencies related to the issuer-pays model. Analyzing a sample of collateralized debt obligations (CDO) issued between 1997 and 2007, Griffin and Tang (2009) report that rating agencies frequently made adjustments to their quantitative model that, on average, amounted to a 12% increase in the AAA tranche size. Ahcraft, Goldsmith-Pinkham, and Vickery (2010) document a progressive decline in rating standards for mortgage-backed securities (MBS) between the start of 2005 and mid-2007. He, Qian, and Strahan (2009) provide evidence that Moody's and S&P rewarded large issuers of MBS by granting them unduly favorable ratings during the boom years of 2004 through 2006. Becker and Milbourn (2010) argue that the increased com-

[1]These default rates are taken from S&P's credit rating report (Standard & Poor's, 2008).

petition from Fitch over the past decade resulted in more issuer-friendly and less informative ratings from S&P and Moody's. Our approach differs from these studies in two important ways. First, rather than relying on changes in the agencies' incentive to issue inflated ratings caused by changes in overall market conditions or in the competitive landscape of the rating industry, we directly compare the ratings of two agencies that follow a different business model (issuer-pays model versus investor-pays model), and relate the difference in ratings to issuer-level proxies for the severity of the conflict of interest associated with the issuer-pays model. Second, by providing evidence of inflated corporate credit ratings, we demonstrate that the incentive problems of credit rating agencies affected not only CDO and MBS ratings, but extended beyond the market for structured financial products.

The remainder of this paper is organized as follows. Section 2 provides some institutional background of the credit rating industry. Section 3 describes the data and discusses our empirical methodology. Section 4 presents our empirical results and Section 5 discusses their robustness. Section 6 summarizes our contribution and concludes.

2 Institutional Background

The credit rating industry has long been dominated by a handful of companies designated as "nationally recognized statistical rating organization" (NRSRO) by the Securities and Exchange Commission (SEC). As of 2002, Standard and Poor's, Moody's, and Fitch were the only rating agencies that were granted NRSRO status. More recently, the SEC—arguably as a result of political pressure and/or concern about concentration in the industry—added another seven rating agencies to this group.[2]

A majority of these rating agencies follow the issuer-pays business model. An exception

[2]Dominion Bond Rating Service (a Canadian rating agency) and A.M. Best (highly regarded for its ratings of insurance companies) received their NROSRO designation in 2003 and 2005, respectively. In 2007, the SEC added two Japanese rating agencies (Japan Credit Rating Agency, Ltd. and Ratings and Investment Information, Inc.) and Egan-Jones Rating Company (EJR). More recently, two other rating agencies, LACE Financial and Realpoint LLC, joined this group.

is the Egan-Jones Rating Company (EJR). EJR is an independent rating agency founded by Sean Egan and Bruce Jones that started issuing ratings in December 1995. Since its foundation, EJR has rated more than 1,300 companies in the industrial, financial, and service sector. According to its rating policy, EJR "selects an issuer for a credit analysis generally based on developments within issuers and industries, market developments and requests of subscribers." EJR uses the same credit rating scales as S&P, namely from AAA to D (including the modifiers "+" and "-") for long-term ratings, and from A-1 to D for short-term ratings.

Relying on subscription fees paid by investors, EJR claims that it "delivers highly accurate ratings with predictive value for equity, debt, and money market portfolios and has no conflicts of interest." With this aim, it successfully predicted the pitfalls of Enron, WorldCom, and more recently, Lehman Brothers through its credit ratings. Beaver, Shakespeare, and Soliman (2006) empirically compare EJR's and Moody's credit ratings, and find that EJR reacts more timely in changing its ratings than Moody's, and EJR's rating changes are followed by a stronger market reaction. These results suggest EJR's ratings seem to be more informative than the issuers-paid major rating agencies'.

As an extension of their results, Figure 1 compares the ability of EJR's and S&P's ratings to predict defaults–the most important credit events. Panel A sorts issuers based on their credit ratings from S&P. Each rating category on the X-axis consists of issuers that have the same S&P ratings. Within each rating category, issuers are further divided into two subgroups: (1) issuers whose EJR ratings are less favorable than S&P's, and (2) issuers whose EJR ratings are equal to or more favorable than S&P's. The pattern in panel A shows that conditional a certain S&P's rating category, issuers that obtain a lower rating from EJR have significantly high default rates at five year horizon. For example, in the "BB" category, issuers with an EJR rating more favorable than or equal to S&P's have an average default rate of 0.71%. In contrast, this number for issuers with an EJR rating less favorable than S&P's

is 10.3%, over ten times higher than its counterpart.[3] More interestingly, Panel B shows a significantly different pattern when issuers are sorted by their EJR ratings. First, within each EJR rating category, all the firms have very similar default rates, which is consistent with the expectation that firms with the same rating should observe similar credit quality. Second, suppose S&P's ratings are more informative. Then within each rating category, issuers whose S&P ratings are lower than EJR's should have a higher default rates than the other group. However, we observe the opposite from the plot. This evidence, first of all, confirms that EJR's ratings are more accurate and informative; and secondly, also suggests that the pattern in Panel A is not solely driven by potential different meanings of the two ratings agencies' ratings. Finally, it also exclude the concern that EJR may issue too conservative ratings in order to differentiate itself from existing issuer-paid rating agencies to make more business from investors.

The above evidence, together with the findings in Beaver, Shakespeare, and Soliman (2006), justifies our use of EJR's ratings as a benchmark, and validate the comparison of S&P's ratings to EJR's.

3 Sample Selection and Empirical Methodology

The rating sample is constructed by combining two rating datasets. EJR's issuer credit ratings are collected from Bloomberg and EJR's database via the company's website. EJR keeps its historical rating records back to July 1999. This database contains EJR's issuer ratings in a time series. Each observation is a credit rating (and the related identification and date information) corresponding to a certain rating action, including new rating assignment, affirmation, upgrade and downgrade. The dataset covers the period from July 1999 to July 2009, with 23,223 observations representing 2,033 issuers. We eliminate issuers that only obtained a newly assigned rating but had not been followed since, due to insufficient information af-

[3]The average default rates of issuers with S&P's rating "B" is 8.8% in the sample.

ter EJR's initial evaluation. We also delete observations corresponding to an "NR" rating because this indicates that EJR withdraws ratings to an issuer. These two steps reduce the EJR rating sample to 22,816 observations with 1,642 issuers. We obtain S&P's issuer credit ratings from S&P's rating Xpress data services. This database contains detailed information on S&P's credit ratings in a time series back to 1920s, including issuer's long-term credit ratings, short-term credit ratings and rating Watchlist and Outlook provision. Similar to EJR's rating database, each observation in S&P's rating database is a credit rating corresponding to a certain rating action. In the initial database, there are 127,849 observations representing 17,298 private and public issuers over the world. We restrict my analysis to U.S. issuers, which leaves us with 72,641 observations from 9,100 private and public issuers.

We construct two quarterly panel datasets for EJR's and S&P's rating database respectively, starting from the third quarter of 1999 to the third quarter of 2009. Following prior literature, we assigned a numerical value to each rating as follows on notch basis: AAA=1, AA+=2, AA=3, AA-=4, A+=5, A=6, A-=7, BBB+=8, BBB=9, BBB-=10, BB+=11, BB=12, BB-=13, B+=14, B=15, B-=16, CCC+=17, CCC=18, CCC-=19, CC=20, C=21, and D=22. Since both rating databases treat a credit rating with an rating action (rather than a credit rating itself) as an observation, I assign a rating in the current quarter equal to the issuer's rating in the past quarter if no rating action happens. In addition, if two rating actions happen in the same quarter (which means that there are two observations in the same quarter), we take the mean of the ratings based on the above numerical conversion. We then merge these two panel datasets by manually matching company names and year-quarter information. We successfully merged 1,574 out of 1,642 issuers from EJR's rating dataset. Since we are interested in issuer's financial activities, we restrict our sample to non-financial and non-utility issuers. This criterion resulted in 1,271 issuers in my rating sample. Issuers' financial information are obtained from COMPUSTAT quarterly database. Our tests are based on the comparison of S&P's ratings to EJR's and therefore require that ratings from both rating agencies are available at a certain time point. The primary sample consists of

issuer-quarter 26,952 observations representing 966 issuers with their financial information available.

Panel A of Table 1 presents descriptive statistics for the primary sample consisting of issuers rated by both S&P and EJR in Column (2). As a comparison, Column (1) presents summary statistics for all non-financial and non-utility public U.S. issuers that are rated by S&P in the sample period. From Panel A, we can see that issuers that are rated by both S&P and EJR are, on average, larger than all issuers rated by S&P, measure by capitalization, total assets and sales. In addition, issuers rated by both rating agencies have lower leverage, higher *Altman's Z-Score* and higher *ROA*. This evidence suggests that these issuers appear to be less risky and more productive than their counterparts. However, their higher *Market-to-Book*, lower *Tangibility* and higher *R&D/Sales* indicate that these issuers tend to invest more heavily on R&D to accommodate the higher growth opportunity and are possibly more difficult to evaluate due to low proportion of fixed assets. These characteristics are consistent with the fact that EJR rates issuers that are requested by its client base, and investors are likely to have a high demand for ratings on issuers that are larger but harder to evaluate.

Our strategy is to compare S&P's and EJR's rating at each firm-quarter observation. Therefore, two variables are defined to capture the rating differences: *Inflation Tendency* and *Inflation Magnitude*. First, we define *Inflation Tendency* as:

$$Inflation\ Tendency_{i,t} = \begin{cases} 1, & \text{if } R_{i,t}^{SP} \text{ is more favorable than } R_{i,t}^{EJR} \\ 0, & \text{Otherwise} \end{cases} \quad (1)$$

where $R_{i,t}^{SP}$ stands for the credit rating of issuer i at time t that is issued by S&P and $R_{i,t}^{EJR}$ stands for the credit rating of issuer i at time t that is issued by EJR. The comparison of credit ratings from the two rating agencies is based on different rating notches that takes into account rating modifiers ("plus (+)" and "minus (-)"). For example, a rating of "BB+"

is more favorable (or higher) than a rating of "BB".[4] A higher value of *Inflation Tendency* means that compared to EJR, S&P issues a more favorable rating to this issuer. Second, I convert each credit rating to the corresponding "*Cumulative Average Issuer Default Rates*" between 1981 and 2007 based on S&P' credit rating report and define *Inflation Magnitude* as :

$$Inflation\ Magnitude_{i,t} = DR_{i,t}^{EJR} - DR_{i,t}^{SP} \tag{2}$$

Where $DR_{i,t}^{EJR}$ and $DR_{i,t}^{SP}$ stand for the default rates corresponding to the credit ratings of issuer i at time t that are issued by EJR and by S&P, respectively. A positive value of *Inflation Magnitude* also indicates that compared to EJR, S&P issues a more favorable rating to an issuer because it predicts the issuer to have a lower default risk. The higher the value of *Inflation Magnitude* is, the more favorable S&P's rating is than EJR's. If the issuer-pay rating model contributes to credit rating inflation, I expect to find that the proxies for the severity of S&P's conflict of interest will have a positive effect in determining the two variables *Inflation Tendency* and *Inflation Magnitude*.[5]

Panel B summarizes the two variables. It is worth noting that *Inflation Tendency* is significantly different from 0. This lends support to the hypothesis that on average, the rating agency that adopts issuer-pay model assigns more favorable ratings than EJR. The magnitude of the difference is also economically significant. For example, the mean of *Inflation Magnitude* is 1.02%. This indicates that for an average issuer, the default rates implied by an S&P rating is 1.02% lower than that implied by EJR's. As a comparison, based on S&P's credit rating report, the average 10-year default rates of all issuers rated by S&P is 8.22% (Standard & Poor's (2008)).

[4]To check the robustness of my results, I also suppress the rating modifiers and compare ratings from the two rating agencies based on rating letters. For example, on letter basis, "BB+" falls into the same category as a rating of "BB" or "BB-", but is different than "BBB+", "BBB" and "BBB-", which fall into the category of "BBB". The results based on rating letters are reported in the Robustness section.

[5]In the Results section, I present the main results only using the OLS model. I check the robustness of my results using the logit model in the Robustness section.

4 Empirical Results

4.1 Issuer's Short-term Liquidity Needs

We start by examining the association between rating inflation and the first proxy for the severity of S&P's conflict of interest: the issuers' amount of short-term debt. An important client who is likely to bring lucrative business in the future will generate a strong incentive for the rating agency (adopting the issuers-pay model) to issue a favorable rating. This incentive is justified under the assumption that preferential treatment today will allow the rating agency to obtain the issuer's business in the future. An issuer's importance to the rating agency's future business can be measured by its its short-term debt volume (short-term liquidity needs). By definition, short-term debt is due within the next year. Therefore, if issuers are exposed to a large amount of short-term debt, it is likely that they need to replace it through new debt issuance in the future and hence, bring new rating business to the rating agency.

Table 2 presents the results of multivariate regression models using the logarithm of the issuer's total short-term debt amount as one of the independent variables. The first two specifications confirm that S&P is more likely to issue higher ratings when issuers' have high short-term liquidity needs. In both the specifications, we include year dummies to capture potential changes in rating standards over time as suggested in Blume, Lim, , and MacKinlay (1998). In the second specification, we control for the issuer's amount of long-term debt, which captures the issuer's past relationship with the rating agency (Covitz and Harrison (2003)). To confirm the robustness of the results, we include additional issuer characteristics as control variables in Specification (3), including the logarithm of *Sales*, *Tangibility, R&D Expense/Sales* (and *R&D Missing Dummy*), and *Market-to-Book*. In addition, one concern regarding the left-hand-side variable is that by construction, the value of *Inflation Magnitude* is expected to be higher when S&P's (EJR's) ratings are closer to (further from) AAA. This happens even if S&P has no incentive to issue inflated rating, but only because S&P's and

EJR's ratings are distributed randomly around each other. In other words, the variables we have included in the model may just capture the relative positions of issuers' rating along the rating spectrum, rather than the true factors that affect rating inflation. To address this concern, we generate dummy variables corresponding to S&P's rating categories on letter basis (AAA, AA, A, etc.) and include them in addition to issuer characteristics.[6] The results in Specification (3) are consistent with previous specifications. Furthermore, Ederington and Goh (1998) study the relative information provided by stock analysts and rating agencies. They find that both provide new information to the market and that Granger causality of this information flows both ways. Inspired by the relation between the two agents, I further examine the association between stock analysts' information and rating agencies' rating inflation. More specifically, we include two variables, *Number of Analysts* and *Standard Deviation of Analysts' Reports* (on EPS). We obtain this information from I/B/E/S monthly summary database. The estimation with inclusion of the two variables is presented in Specification (4). S&P tends to issue less inflated ratings if an issuer is followed by more stock analysts and more likely to do so if the analysts' opinions are more dispersed. This finding implies rating agencies' tendency to issue inflated rating may be constrained by other information providers. It also indicates that stock analysts can have a disciplinary role on the agents in credit market.

One limitation of the model so far is that it does not control for unobservable characteristics of issuers that may be correlated with their motivation to obtain high ratings. To address this omitted variable concern, we estimate an issuer-fixed effect model. This model is estimated in Specification (5) and Specification (6). The results remain significant. This further confirms the positive relationship between rating inflation and the importance of issuers.

[6] We check the robustness of my results by including EJR's rating letter dummies as an alternative specification. All results presented in this paper are qualitatively similar in the two specifications.

4.2 The Rating Agency's Revenue Share

While many issuers obtain more than one credit rating from major rating agencies, only fewer than ten percent of investors are required to hold securities from issuers with two or more ratings (Baker and Mansi (2001)). Therefore, major rating agencies face competition from each other in terms of rating business. Becker and Milbourn (2010) find that as S&P and Moody's face strong competition from Fitch, they produce more issuer-friendly and less informative ratings. In similar spirit with this study, we expect that when the rating agency senses the threat of losing an issuer as its future client (more intense competition), it will be tempted to issue favorable ratings to solidify its business relationship with the issuer. We measure competition facing the rating agency as its revenue share on a per-client basis, namely the proportion of the issuer's bonds that are rated by S&P to those that are rated by the major three rating agencies (S&P, Moody's and Fitch). This measure is similar to the one used in Becker and Milbourn (2010), where they define revenue share as the *Fraction of Bond Issues Rated by S&P in the Past n Quarters*, namely the number of bonds issued by issuer i during the past n quarters that are rated by S&P as a fraction of those that are rated by the major three rating agencies (S&P, Moody's and Fitch) in total.

To measure S&P's revenue share, we trace each issuer's debt-issuance activity on quarterly basis back to the past two years at each time point from The Fixed Investment Securities Database (FISD). This database provides key characteristics on almost all publicly traded bond issuances and is merged using issuer's 6-digit CUSIP to the primary sample. We show results using revenue share based on different time windows including past 2 quarters, 4 quarters, 6 quarters, and 8 quarters. Figure 2 shows the time trend of S&P's revenue share in the past 4 and 8 quarters on quarterly basis. We exclude 2008 and 2009 because of the abnormally small amount of bond issuance due to the financial crisis. As a comparison, I also include the measure used in Becker and Milbourn (2010). First, the two measures of revenue share move closely along each other and are close to 50% between 1999 and 2003. Second,

consistent with the finding in Becker and Milbourn (2010), there is an apparent declining trend in S&P's revenue share starting from the second half of 2003. These features arise from the fact that many issuers obtain two ratings for their bond issuance from both S&P and Moody's before 2003 when competition in the rating industry was limited to the two major rating agencies and Fitch's market share was relatively small. Starting 2005, however, Fitch has been playing an important role because of its inclusion as a rater to Lehman Brothers Aggregate U.S. Bond index. This change shifts S&P's revenue share from close to 50% to around 33%. Table 3 presents the issuer-fixed-effect regression analysis. Consistent with our hypothesis, Table 3 shows that issuers are more likely to receive a higher rating from S&P if S&P's revenue share is lower. For example, using the past-4-quarter window, the coefficient on *Fraction of Bond Issues Volume Rated by S&P* is -1.535 and is significantly at 5% level. This significant negative relationship between S&P's revenue share and its tendency to issue an inflated rating holds in all specifications with revenue shares measured up to the past 8 quarters.

4.3 Issuers' Management Turnover

A firm's CEO and CFO play an important role in rating process (Graham and Harvey (2001), Kisgen (2006),Kisgen (2007), Kisgen (2009) and Norris (2009)). CFOs and CEOs usually determines which rating agencies to request a rating from, and they are actively involved in the credit rating process (Fight (2001)). Giambatista, Rowe, and Riaz (2005) (need Gunter's bib file) claim that newly appointed corporate leaders are more inclined to change the firm's operational and financial strategy, and hence are more likely to switch rating agencies. Based on this intution, we hypothesize that S&P is more likely to issue an inflated rating following an issuer's appointment of a new CFO or CEO, in order to build a good relationship with the issuer's management and hence generate more future business.

To examine this hypothesis, we obtain CEO and CFO information from COMPUSTAT EXECUCOMP annual database. We identify CEOs following EXECUCOMP's classification

using data item CEOANN where a CEO is identified if CEOANN=CEO. Following Gopalan, Song, and Yerramilli (2010), we identify CFOs based on managers' titles from data item TITLEANN. A CFO is identified if a manager's title contains: CFO, chief financial officer, finance, treasurer, VP-finance or a combination of two or more of them. We identify that a new CFO (CEO) if assigned in the current fiscal year if an issuer's current CFO (CEO) is different from the past fiscal year. To be consistent with the EXECUCOMP annual-based data, we aggregate *Inflation Tendency* and *Inflation Magnitude* to annual level by taking the mean of their values in the four quarters during each fiscal year, and do the analysis on the annual basis. We restrict our analysis to issuer-year where information on both CEO and CFO is available.

Table 4 presents the results of the issuer-fixed-effect regression model. Consistent with the hypothesis, we observe in Specification (1) that there is a boost in rating inflation in the year when a new CFO is appointed (*new CFO (t)*) and the following year (*new CFO (t-1)*). Interestingly, in Specification (2), while the coefficients *new CEO (t)* and *new CEO (t-1)* are also positive, they are not significant at 10% level. This indicates that CFOs seem to have larger impact than CEOs in affecting the rating agencies strategies. This evidence is consistent with prior studies that find CFOs are more influential in certain areas related to the management of a issuer's financial system because of their ultimate responsibility in those areas (Mian (2001), Geiger and North (2006) and Jiang, Petroni, and Wang (2008)), and hence the appointment of a new CFO may give a stronger incentive for the rating agency to build a good relationship through an inflated rating. Specification (3) includes both CFO and CEO appointment dummies in the regression. The coefficients on the two CFO dummies are very close to Specification (1), suggesting that the effects of a new CFO is not likely to be driven by concurrent CEO changes. This result lend further support to the results in Specification (1) and (2).

4.4 The Information Value of Credit Ratings

The results so far raise questions about the value of credit ratings and the effectiveness of ratings as a gauge of issuers' credit quality. However, it is not clear whether inflated ratings have any welfare effects. If investors anticipate the bias in S&P's ratings and correctly adjust for such bias, no misallocation of resources will be observed. To explore investors' knowledge of potential bias in credit ratings, we examine the association between issuers' bond yield spreads and the proxies for the severity of S&P's conflicts of interest. To avoid noise from secondary-market trading activities, we examine the *Treasury Spread* for new bond issuance. This is defined as the difference between the issue's offering yield and the yield on a benchmark treasury security (a U.S. treasury bond) with similar duration and maturity. This information is obtained from The Fixed Investment Securities Database (FISD). We restrict our sample to each issuer's issuance of senior unsecured bonds during the sample period, in order to match the major rating agencies' definition of issuer's credit rating. In addition, we exclude any issuance of bonds that are callable, puttable, convertible, exchangeable, with sinking fund or with refund protection. We also need the following financial variables for each issuance as control variables: *Enhancement* as a dummy variable that equals 1 if the issue has credit enhancements, *Covenants* as a dummy variable that equals 1 if the debt issue contains covenants in the contract, *Ln(Bond Issue Amount)* as the logarithm of the par value of the debt issue in millions of dollars and *Maturity in Years* as the number of years to maturity of debt.

We apply an OLS regression with *Treasury Spread* as the dependent variable and include S&P's issuer's rating fixed effects. If investors can not accurately anticipate rating agencies' tendency to issue biased credit ratings, we expect to see an insignificant relation between *Treasury Spread* and the variables that can predict S&P's incentive to issue inflated ratings. The results are presented in Table 5. Notice that except *Ln(Short-term Debt)* in Specification (1), all other variables that have been shown to be correlated with S&P's incentive to issue

inflated ratings shows up insignificantly (certain variables show the wrong sign). Therefore, we can not reject the null hypothesis that investors do not adjust for any potential rating bias. These results are consistent with the notion that regulators as well as investors may not well understand the information value of credit ratings. Our results on investors' lack of knowledge about the value of credit ratings provide justification for regulators' intervention in the credit rating industry, which would be beneficial to investors who use credit ratings to guide their investment decisions.

5 Robustness

5.1 Adjusted and Broader Rating Categories

One concern on the tests so far is that S&P's ratings are usually based on the "through-the-cycle" system. This feature implies that compared to EJR's ratings, S&P's ratings tend to be more forward-looking and more stable. Therefore, our previous results may capture the difference in the nature of the two rating agencies and in the information the two types of ratings are based on. To resolve this concern, we take into account S&P's watchlist and outlook provisions. These two rating actions, by definition, reflect information in a more timely manner and can therefore be thought as a refinement of long-term credit ratings. Following existing literature, we adjust S&P's long-term ratings downwards (closer to default) by one notch if S&P have put the rating on negative outlook (watchlist), and upwards (closer to "AAA") by one notch if S&P have put the rating on positive outlook (watchlist). The results are presented in Table 7, including different specifications from Table 2, Table 3, and Table 4.

In addition, previous tests utilize rating categories on notch basis that takes into account rating modifiers ("plus (+)" and "minus (-)"). As a robustness check, I suppress rating modifiers and define rating differences on letter basis. More specifically, on letter basis, a rating of "AA+" is considered as the same as a rating of "AA" or "AA-", and is more

favorable than a rating of "A+", "A" or "A-", where the latter three are considered the same. In this way, we redefine the variable *Inflation Tendency*. Based on this new definition, I re-estimated specifications from Table 2, Table 3, and Table 4. The estimation results are presented in Table 7. We can see that the coefficients on most of the key variables used in previous estimation remain significant in both tables, and all of them are of the correct sign. This evidence confirms that our previous results are robust to adjusted rating categories.

5.2 Endogeneity Concern Tests

Issuers' amount of debt may be endogenous. Issuers who obtain a rating that is better than what they deserve (an inflated rating) may want to take advantage of this lower cost of capital and issue more debt. This raises concern that the endogenous choice of debt volume may drive the results in Table 2. To resolve this potential endogeneity problem, we replace *Ln(Short-term Debt)*) with the new variable *Ln(Long-term Debt Due)*. *Ln(Long-term Debt Due)* is defined as the logarithm of the amount of long-term debt that is due within one year. Similar to *Ln(Short-term Debt)*, the amount of debt due within a year also measures how much future business an issuer can get to the rating agency. However, the repayment schedule of long-term debt is likely to have been determined years in the past, and thus less likely to be affected by the rating agency's current ratings. In other words, *Ln(Long-term Debt Due)* is not likely to be subject to the endogeneity problem.

I repeat the estimations in Table 2 with *Ln(Long-term Debt Due)* as the main independent variable. Table 8 represents the results. The results indicate that the coefficient on *Ln(Long-term Debt Due)* is positive and significant, suggesting that issuers that are likely to bring more future business to the rating agency obtain higher ratings from S&P. This evidence confirms that the endogenous choice of debt is not likely to drive the results in Table 2.

5.3 Selection Bias from Rating Shopping

One concern about the previous results is that some issuer characteristics such as the amount of short-term liquidity needs may also capture issuers' engagement in rating shopping. Rating shopping refers to the practice that an issuer approaches different rating agencies and receives preliminary ratings on its credit quality. The issuer then chooses the highest rating from a certain rating agency and publishes that rating as a credit rating, while discards the rest lower ones without disclosing them publicly. Therefore, if an issuer has shopped ratings before it publishes one, the observed rating of this issuer, by definition, will be higher than the average of the preliminary ratings from all the rating agencies it has approached. The higher rating we observe can just be a result of the fact that rating agencies receive noisy signals on the issuer's credit quality, and one rating agency's ratings are randomly distributed around another rating agency's ratings. In this case, the observed rating is high even though neither rating agencies has overstated the issuer's credit quality. If issuer characteristics we used before happened to capture issuer's involvement of rating shopping, which in turn, leads to a high rating, our results are biased.

To address this concern, we employ a Heckman selection model. More specifically, we run a two-stage estimation, where the first stage utilizes a probit model to estimate what issuer characteristics contribute to issuers' engagement in rating shopping. The second stage test regresses *Inflation Magnitute* on proxies for the severity of S&P's conflict of interest in previous sections. The coefficients of the second stage estimation is adjusted for the selection bias (if any) based on the first stage regression and are therefore unbiased. Following the definition of rating shopping, we define a *Rating Shopping Dummy* (that will be used in the first stage estimation) equal to 0 if an issuer has three published ratings from S&P, Moody's and Fitch, and equal to 1 if it only has one published rating from S&P. This definition requires issuer credit rating data from Moody's and Fitch. Due to data availability, we use the bond-rating information from FISD database, and assume an issuer has a published rating from

Moody's (Fitch) at a certain time point if one of the issuer's outstanding senior unsecured bonds are rated by Moody's (Fitch) at the same time. This assumption is based on the fact major rating agencies provide an issuer credit rating for every borrower for which it rates any security. This approach generates comparable results as previous studies. For example, in my sample, over 95% of issuers obtains issuer's ratings from both S&P and Moody's, and about 60% of issuers obtains a third rating from Fitch, consistent with Bongaerts, Cremers, and Goetzmann (2010). The results of the Heckman selection model are presented in Table 9. After controlling for the first-stage selection effects, the coefficients on the key variables remain significant and of correct sign. These results resolve the selection effect concerns and lend further evidence on the relation between rating inflation and the issuer-pay rating model.

5.4 Rating Inflation Tendency

To further check the robustness of our results, we estimate logit regression models using *Inflation Tendency* as the dependent variable. The variable *Inflation Tendency* is defined in Equation (1). Similar to *Inflation Magnitude*, a higher value of this measure indicates that S&P is more likely to issue a rating higher than EJR's. The specifications we estimated using *Inflation Magnitude* include specifications from Table 2, Table 3, and Table 4. Table 10 presents the results and confirms the findings in our previous tests.

6 Conclusion

In this paper, we test if the issuer-pay rating model adopted by major rating agencies contributes to rating agencies' incentives to issue inflated ratings. We employ a dataset that combines credit ratings issued by rating agencies that adopt two types of rating models: issuer-pay based model and investor-pay based model. We find that compared to a rating agency that adopts the investor-pay rating model, the rating agency that uses the issuer-pay model tends to assign a more favorable rating to an issuer if doing so will be compensated by a

higher expected revenue. We employ a number of measures to proxy for the severity of S&P's conflict of interest, including (1) issuers' short-term liquidity needs, (2) the rating agency's revenue share and (3) issuers' management turnover. We find evidence of rating inflation using different proxies. These findings raise question about the value of credit ratings.

Our findings shed light on the continuing debate over rating agencies' incentives in face of the issuer-pay rating model and justifies recent regulatory proposals aiming to prevent rating agencies' from exploiting the conflicts of interest. Our analysis also provides policy implications that regulators' intervention and effort to promote a more transparent rating industry will benefit investors and can lead to improvement in social welfare.

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Figure 1: Five-Year Default Rates for S&P's and EJR's Credit Ratings

This figure presents default rates at the five-year horizon from the second quarter of 1999 to the fourth quarter of 2007, sorted by S&P's rating categories (Panel A) and EJR's rating categories (Panel B).

Panel A

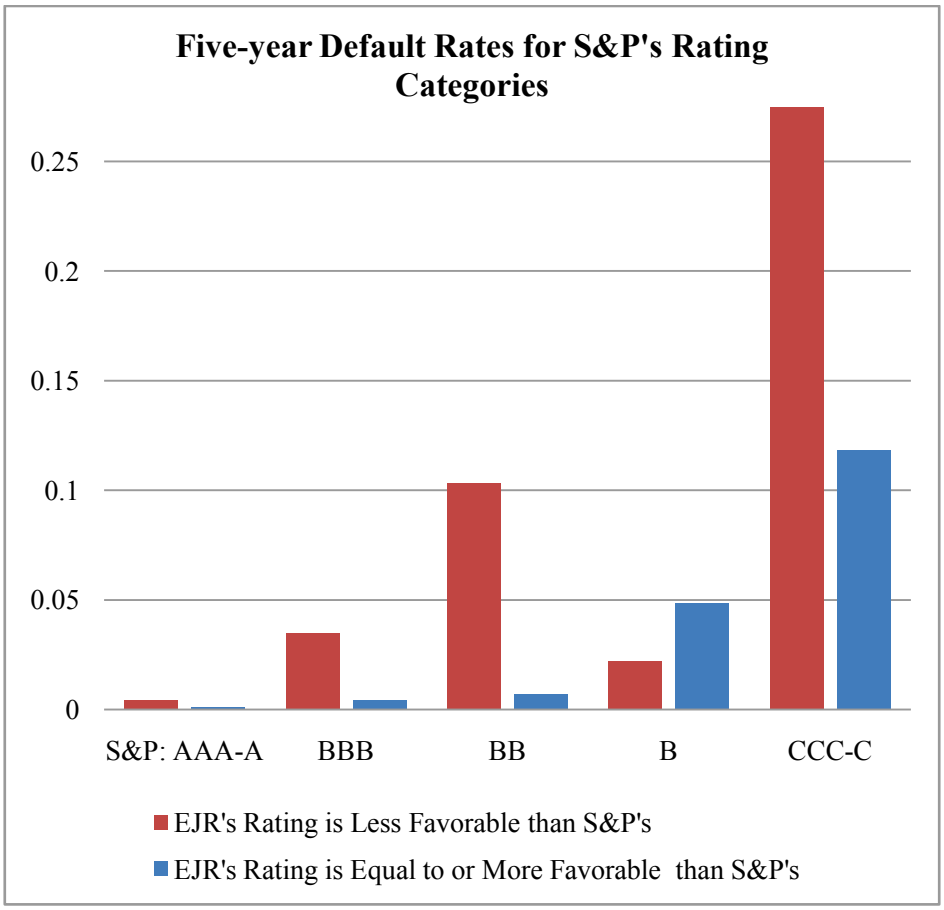


Figure 1 (Continued):

Panel B

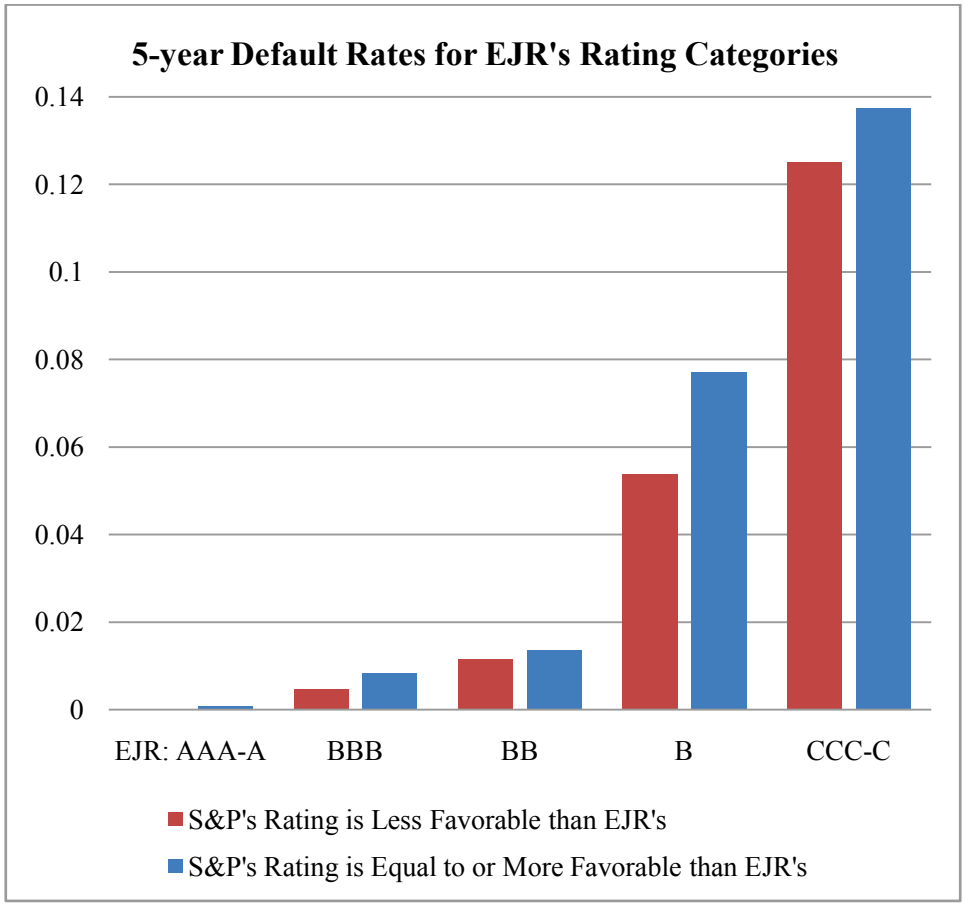
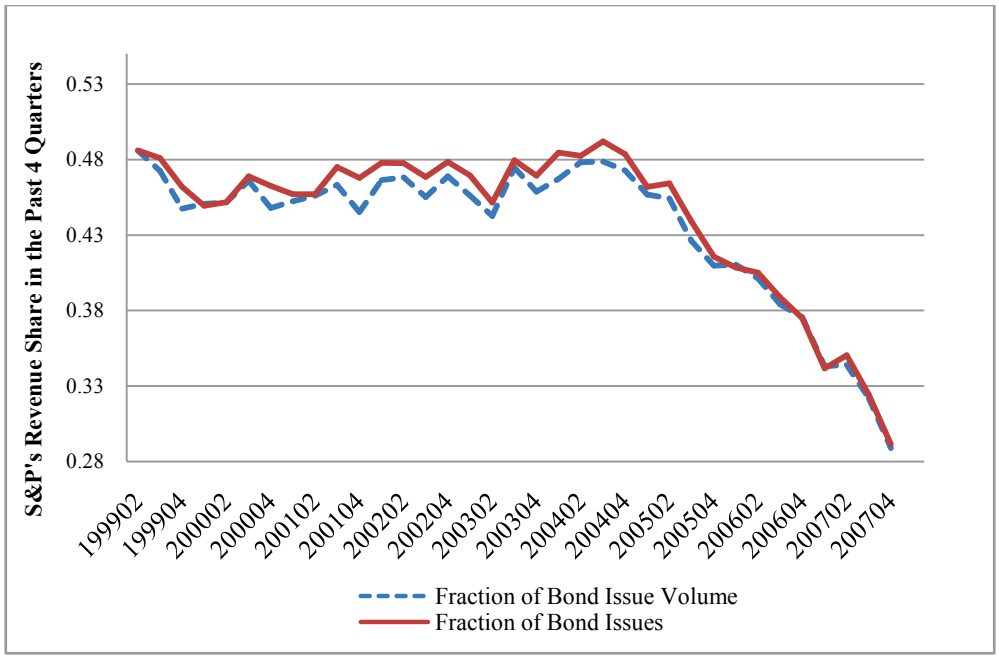


Figure 2: S&P's Revenue Share

This figure plots S&P's revenue share among major rating agencies (S&P, Moody's and Fitch) in each quarter from the second quarter of 1999 to the fourth quarter of 2007. Panel A plots S&P's revenue share in the past 4 quarters. Panel B plots S&P's revenue share in the past 8 quarters.



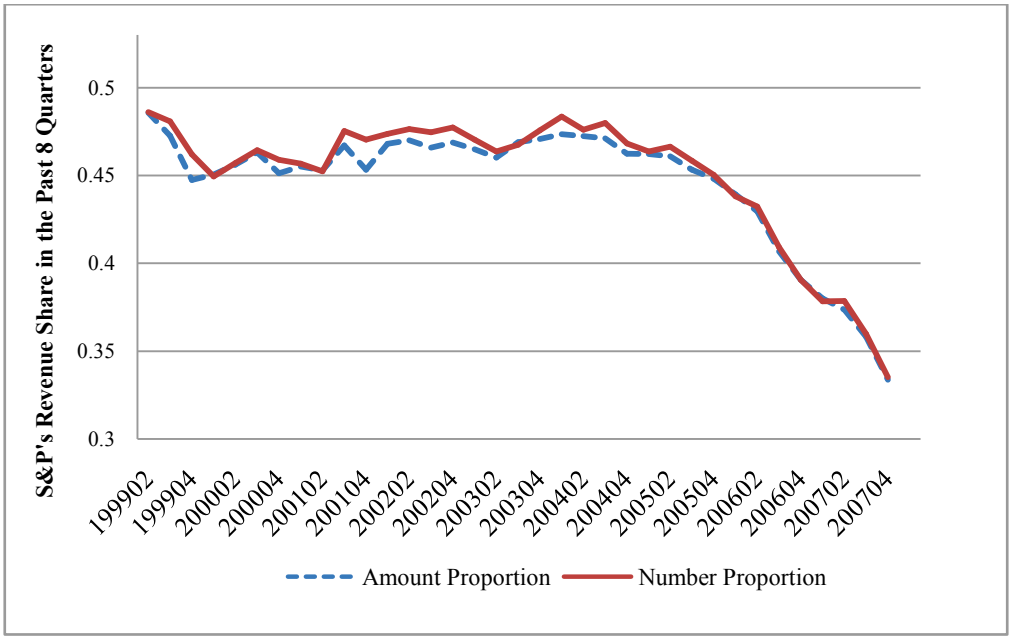


Table 1: Rating Sample Summary Statistics

This table presents descriptive statistics for the rating sample from the third quarter of 1999 to the third quarter of 2009. Panel A reports issuer characteristics. Column (2) contains non-financial, non-utility U.S. issuers that are rated by both S&P and EJR. Column (1) contains all non-financial, non-utility U.S. issuers that are rated by S&P. *Total Asset* and *Sales* are in million U.S. dollars. *Leverage* is the ratio of total debt from the balance sheet to total assets; *Market-to-Book* is the ratio of the market value of assets to total assets, where the numerator is defined as the sum of market equity and total debt; *ROA* is the ratio of operating income before depreciation to total assets; *Tangibility* is the ratio of net property, plant, and equipment to total assets, *R&D/Sales* is the ratio of R&D expense to sales, where R&D expense is replaced by 0 if missing, *R&D Missing Dummy* equals 1 if R&D expense is missing and *Altman's Z-Score* is the sum of 3.3 times pre-tax income, sales, 1.4 times retained earnings, and 1.2 times net working capital all divided by total assets. Difference in mean and median between the two samples is denoted by ***, **, * to indicate statistical significance at the 1%, 5% and 10% levels, respectively. Panel B reports summary statistics of the two variables *Inflation Tendency* and *Inflation Magnitude* as defined in Equation (1) and Equation (2). *** next to the mean of *Inflation Tendency* and *Inflation Magnitude* indicates significant difference from 0 at 1% level.

Panel A: Issuer Characteristics

	Issuers Rated by S&P (1)			Issuers Rated by S&P and EJR (2)		
	N	Mean	Median	N	Mean	Median
Capitalization ($M)	52825	7541.449	1515.985	25020	10590.69***	2797.888***
Total Asset ($M)	68016	8837.009	2012.826	25856	11172.79***	3701.055***
Sales ($M)	68466	1306.214	343.106	25907	2135.449***	799.197***
Leverage	67949	0.422	0.369	25840	0.353***	0.325***
Market-to-Book	52793	1.334	1.055	25005	1.335	1.079***
ROA	62193	0.030	0.029	24143	0.033***	0.031***
Tangibility	65119	0.367	0.318	25448	0.354***	0.304***
Altman's Z-Score	41109	2.331	2.246	21171	2.406*	0.261***

Panel B: S&P's and EJR's Rating Difference

	N	Mean	Median	Standard Deviation	25% Percentile	75% Percentile
Inflation Tendency	26952	0.370***	0.000	0.483	0.000	1.000
Inflation Magnitude	26952	1.016***	0.000	8.989	-1.080	2.010

Table 2: Rating Inflation and the Rating Agency's Future Business

This table presents results of OLS regression models. The dependent variable is *Inflation Magnitude* defined in Equation (2). *Ln(Long-term Debt)* is the logarithm of long-term debt; *Ln(Short-term Debt) is the logarithm of short-term debt; Ln(Sales)* is the logarithm of sales; *Tangibility* is the ratio of net property, plant, and equipment to total assets; *R&D/Sales* is the ratio of R&D expense to sales, where R&D expense is replaced by 0 if missing; *R&D Missing Dummy* equals 1 if R&D expense is missing; *Market-to-Book* is the ratio of the market value of assets to total assets, where the numerator is defined as the sum of market equity and total debt; *Number of Analysts* is the number of analysts' reports on EPS in the last month of each quarter; *Standard Deviation of Analysts' Reports* is the standard deviation of analysts' reports on EPS in the last month of each quarter. All above variables are measured at time t-1. *Year Dummies* are indicator variables for the fiscal years. *S&P Rating Letter Dummies* are indicator variables for S&P's rating categories. *Issuer Fixed Effects* are indicator variables for issuers. Robust standard errors clustered at issuer level are in parentheses. ***, ** and * indicate statistical significance at the 1%, 5%, and 10 % level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Ln(Short-term Debt)	0.314***	0.142**	0.380***	0.199***	0.260***	0.282***
	(0.0760)	(0.0702)	(0.0889)	(0.0649)	(0.0682)	(0.0663)
Ln(Long-term Debt)		0.496***	0.341*	0.576***	0.831***	0.785***
		(0.166)	(0.189)	(0.176)	(0.208)	(0.201)
Ln(Sales)			-0.380	0.0790	-1.624***	-1.823***
			(0.252)	(0.213)	(0.377)	(0.374)
Tangibility			0.168	0.0725	4.820**	5.139**
			(1.054)	(0.903)	(2.362)	(2.427)
R&D/Sales			0.908	2.653	4.970**	4.625*
			(1.503)	(1.999)	(2.491)	(2.432)
R&D Missing Dummy			0.400	-0.0471	0.408	0.397
			(0.410)	(0.409)	(0.415)	(0.414)
Market-to-Book			-1.141***	-0.562***	-0.401**	-0.446***
			(0.217)	(0.173)	(0.161)	(0.168)
Number of Analysts				-0.136***	-0.0397	-0.0663*
				(0.0271)	(0.0412)	(0.0397)
Standard Deviation of Analysts' Reports				1.039***	0.782***	0.966***
				(0.374)	(0.172)	(0.184)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
S&P Rating Letter Dummies	No	No	Yes	Yes	No	Yes
Issuer Fixed Effects	No	No	No	No	Yes	Yes
Observations	25233	25202	24157	18404	18404	18404
R-squared	0.019	0.024	0.066	0.081	0.072	0.091

Table 3: Rating Inflation and the Rating Agency's Revenue Share

This table presents results of regression models. The dependent variable is *Inflation Magnitude* defined in Equation (2). *Fraction of Bond Issue Volume Rated by S&P in the Past n Quarters* is the offering amount of bonds issued by an issuer during the past n quarters that are rated by S&P as a fraction of those that are rated by the major three rating agencies (S&P, Moody's and Fitch) in total. *S&P Investment Grade Dummy* equals 1 if an issuer's S&P rating from last quarter is higher than "BB+" and equals 0 otherwise. *Ln(Total Debt)* is the logarithm of total debt; *Ln(Sales)* is the logarithm of sales; *Tangibility* is the ratio of net property, plant, and equipment to total assets; *R&D/Sales* is the ratio of R&D expense to sales, where R&D expense is replaced by 0 if missing; *R&D Missing Dummy* equals 1 if R&D expense is missing; *Market-to-Book* is the ratio of the market value of assets to total assets, where the numerator is defined as the sum of market equity and total debt. All above variables are measured at time t-1. *Year Dummies* are indicator variables for the fiscal year. *S&P Rating Letter Dummies are indicator variables that correspond to S&P's rating categories. Issuer Fixed Effects* are indicator variables for issuers. Robust standard errors clustered at issuer level are in parentheses. ***, **, * indicate significant than zero at 1%, 5%, and 10 % level, respectively.

	Past 2 Quarters	Past 4 Quarters	Past 6 Quarters	Past 8 Quarters
	(1)	(2)	(3)	(4)
Fraction of Bond Issue Volume Rated by S&P	-1.278**	-1.535**	-1.471**	-1.291*
	(0.579)	(0.645)	(0.695)	(0.727)
Ln(Total Debt)	2.335***	2.388***	2.584***	2.524***
	(0.556)	(0.518)	(0.491)	(0.489)
Ln(Sales)	-1.928***	-1.588***	-1.291***	-1.499***
	(0.594)	(0.480)	(0.479)	(0.428)
Tangibility	5.062	8.398**	9.538***	7.952**
	(3.910)	(3.963)	(3.566)	(3.095)
R&D/Sales	0.215	0.296	0.993	1.250
	(0.972)	(0.525)	(0.821)	(1.119)
R&D Missing Dummy	0.0976	-0.00914	0.250	0.202
	(0.705)	(0.536)	(0.467)	(0.410)
Market-to-Book	-1.498***	-1.573***	-1.381***	-1.195***
	(0.282)	(0.276)	(0.251)	(0.250)
Year Dummies	Yes	Yes	Yes	Yes
S&P Rating Letter Dummies	Yes	Yes	Yes	Yes
Issuer Fixed Effects	Yes	Yes	Yes	Yes

Table 4: Rating Inflation and Issuers' Management Turnover

This table presents results of fixed-effect OLS regression models. The dependent variable is *Inflation Magnitude* defined in Equation (2). *New CFO (CEO) (t)* equals 1 for the fiscal year when an issuer appoints a new CFO (CEO), and equals 0 otherwise; *New CFO (CEO) (t-1)* is the one-year lag of *New CFO (CEO) (t)*. *Ln(Total Debt)* is the logarithm of total debt; *Ln(Sales)* is the logarithm of sales; *Tangibility* is the ratio of net property, plant, and equipment to total assets; *R&D/Sales* is the ratio of R&D expense to sales, where R&D expense is replaced by 0 if missing; *R&D Missing Dummy* equals 1 if R&D expense is missing; *Market-to-Book* is the ratio of the market value of assets to total assets, where the numerator is defined as the sum of market equity and total debt. All above variables are measured at time t-1. *Year Dummies* are indicator variables for the fiscal years. *S&P Rating Letter Dummies* are indicator variables for S&P's rating categories. *Issuer Fixed Effects* are indicator variables for issuers. Robust standard errors clustered at issuer level are in parentheses. ***, ** and * indicate statistical significance at the 1%, 5%, and 10 % level, respectively.

	(1)	(2)	(3)
New CFO (t-1)	0.876**		0.822**
	(0.365)		(0.356)
New CFO (t)	0.849**		0.786**
	(0.404)		(0.396)
New CEO (t-1)		0.664	0.557
		(0.466)	(0.456)
New CEO (t)		0.626	0.509
		(0.435)	(0.425)
Ln(Total Debt)	0.900***	0.895***	0.904***
	(0.329)	(0.332)	(0.328)
Ln(Sales)	-1.724**	-1.702**	-1.706**
	(0.793)	(0.786)	(0.790)
Tangibility	8.003*	8.083*	7.948*
	(4.407)	(4.478)	(4.422)
R&D/Sales	11.99***	11.79***	11.99***
	(4.233)	(4.196)	(4.234)
R&D Missing Dummy	3.420*	3.458*	3.474*
	(1.845)	(1.862)	(1.845)
Market-to-Book	-0.599***	-0.613***	-0.587**
	(0.230)	(0.231)	(0.229)
Year Dummies	Yes	Yes	Yes
S&P Rating Letter Dummies	Yes	Yes	Yes
Issuer Fixed Effects	Yes	Yes	Yes
Observations	3424	3424	3424
R-squared	0.225	0.224	0.226

Table 5: Do Investors Adjust for Rating Bias?

This table presents results of fixed-effect OLS models. The dependent variable is *Treasury Spread* for new bond issuance. *Ln(Long-term Debt)* is the logarithm of long-term debt; *Ln(Short-term Debt)* is the logarithm of short-term debt; *New CFO (CEO) (t-1) is the one-year lag of New CFO (CEO) (t),* which equals 1 for the fiscal year when an issuer appoints a new CFO (CEO), and equals 0 otherwise*; Past-4-quarter Fraction of Bond Issue Volume Rated by S&P* is the offering amount of bonds issued by an issuer during the past 4 quarters that are rated by S&P as a fraction of those that are rated by the major three rating agencies (S&P, Moody's and Fitch) in total. *Enhancement* is a dummy variable that equals 1 if the issue has credit enhancements; *Covenants* is a dummy variable that equals 1 if the debt issue contains covenants in the contract. *Ln(Bond Issue Amount)* is the logarithm of the par value of the debt issue in millions of dollars and *Maturity in Years* is the number of years to maturity of debt. *Year Dummies* are indicator variables for the fiscal year. *S&P Rating Letter Dummies are indicator variables that correspond to S&P's rating categories. Issuer Fixed Effects* are indicator variables for issuers. Robust standard errors clustered at issuer level are in parentheses. ***, ** and * indicate statistical significance at the 1%, 5%, and 10 % level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Ln(Short-term Debt)	6.877**				1.099	9.827
	(3.075)				(2.713)	(10.40)
Past-4-quarter Fraction of Bond Issue Volume Rated by S&P		-67.79				-142.8
		(44.01)				(93.62)
New CFO (t-1)			-4.803		-7.261	-28.79
			(9.199)		(9.688)	(22.01)
New CEO (t-1)				7.548	9.644	22.96
				(8.981)	(9.990)	(21.76)
Enhancement	3.762	6.176	18.76	18.99	16.89	113.9**
	(28.87)	(36.70)	(39.48)	(39.52)	(43.35)	(44.33)
Covenants	-76.37***	-64.17***	-65.12***	-64.81***	-67.66***	-122.5***
	(17.36)	(17.01)	(17.98)	(18.03)	(18.26)	(44.80)
ln (Bond Issuance Amount)	0.797	7.325	8.607	8.335	6.724	-0.549
	(6.033)	(7.210)	(7.391)	(7.412)	(7.265)	(8.988)
Bond Maturity in Years	0.858***	0.724***	0.753***	0.765***	0.807***	0.454
	(0.253)	(0.235)	(0.245)	(0.242)	(0.246)	(0.447)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
S&P Issuer Rating Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Issuer Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1725	673	1267	1267	1224	484
R-squared	0.780	0.835	0.763	0.763	0.764	0.757

Table 6: Test for Rating Inflation using Adjusted S&P Ratings

This table presents results of regression models. The dependent variable is *Inflation Magnitude* defined in Equation (2). S&P ratings are adjusted for credit watchlist and outlook. S&P's long-term ratings are adjusted downwards (closer to default) by one (half a) notch if S&P have put the rating on negative outlook (watchlist), and upwards (closer to "AAA") by one (half a) notch if S&P have put the rating on positive outlook (watchlist). *Ln(Long-term Debt)* is the logarithm of long-term debt; *Ln(Short-term Debt)* is the logarithm of short-term debt; *New CFO (t) equals 1 for the fiscal year when an issuer appoints a new CFO, and equals 0 otherwise; New CFO (t-1) is the one-year lag of New CFO (t).Past-n-quarter Fraction of Bond Issue Volume Rated by S&P* is the offering amount of bonds issued by an issuer during the past n quarters that are rated by S&P as a fraction of those that are rated by the major three rating agencies (S&P, Moody's and Fitch) in total. *S&P Investment Grade Dummy* equals 1 if an issuer's S&P rating from last quarter is higher than "BB+" and equals 0 otherwise. *Ln(Total Debt)* is the logarithm of total debt; *Ln(Sales)* is the logarithm of sales; Tangibility is the ratio of net property, plant, and equipment to total assets; *R&D/Sales* is the ratio of R&D expense to sales, where R&D expense is replaced by 0 if missing; *R&D Missing Dummy* equals 1 if R&D expense is missing; *Market-to-Book* is the ratio of the market value of assets to total assets, where the numerator is defined as the sum of market equity and total debt. All above variables are measured at time t-1. *Year Dummies* are indicator variables for the fiscal year. *S&P Rating Letter Dummies are indicator variables that correspond to S&P's rating categories. Issuer Fixed Effects are indicator variables for issuers.* Robust standard errors clustered at issuer level are in parentheses. ***, **, * indicate significant than zero at 1%, 5%, and 10 % level, respectively.

	(1)	(2)	(3)	(4)
Ln(Short-term Debt)	0.211***			
	(0.0789)			
Past-4-quarter Fraction of Bond Issue Volume Rated by S&P		-1.208**		
		(0.584)		
Past-8-quarter Fraction of Bond Issue Volume Rated by S&P			-1.142*	
			(0.671)	
New CFO (t-1)				0.608*
				(0.357)
New CFO (t)				0.631
				(0.399)
Ln(Long-term Debt)	0.678***			
	(0.214)			
Ln(Total Debt)		1.442***	1.673***	0.663*
		(0.438)	(0.399)	(0.342)
Ln(Sales)	-1.905***	-1.006**	-1.033***	-1.671**
	(0.456)	(0.443)	(0.364)	(0.749)
Tangibility	7.882**	9.109**	9.258***	7.190*
	(3.132)	(3.631)	(2.700)	(4.282)
R&D/Sales	-0.230	-0.706	0.341	19.39**
	(1.187)	(0.856)	(1.040)	(9.736)
R&D Missing Dummy	-0.180	0.184	0.271	4.224**
	(0.430)	(0.409)	(0.336)	(2.058)
Market-to-Book	-0.310**	-1.152***	-0.814***	-0.187
	(0.149)	(0.231)	(0.195)	(0.191)
Year Dummies	Yes	Yes	Yes	Yes
S&P Rating Letter Dummies	Yes	Yes	Yes	Yes
Issuer Fixed Effects	Yes	Yes	Yes	Yes
Observations	24157	5827	8863	3424
R-squared	0.125	0.149	0.141	0.207

Table 7: Test for Rating Inflation on Letter-Based Rating Categories

This table presents results of fixed-effect OLS regression models. The dependent variable is *Inflation Magnitude* defined in Equation (2). *Ln(Long-term Debt)* is the logarithm of long-term debt; *Ln(Short-term Debt)* is the logarithm of short-term debt; *New CFO (t) equals 1 for the fiscal year when an issuer appoints a new CFO , and equals 0 otherwise; New CFO (t-1) is the one-year lag of New CFO (t). Past-n-quarter Fraction of Bond Issue Volume Rated by S&P* is the offering amount of bonds issued by an issuer during the past n quarters that are rated by S&P as a fraction of those that are rated by the major three rating agencies (S&P, Moody's and Fitch) in total. *Ln(Total Debt)* is the logarithm of total debt; *Ln(Sales)* is the logarithm of sales; Tangibility is the ratio of net property, plant, and equipment to total assets; *R&D/Sales* is the ratio of R&D expense to sales, where R&D expense is replaced by 0 if missing; *R&D Missing Dummy* equals 1 if R&D expense is missing; *Market-to-Book* is the ratio of the market value of assets to total assets, where the numerator is defined as the sum of market equity and total debt. All above variables are measured at time t-1. *Year Dummies* are indicator variables for the fiscal years. *S&P Rating Letter Dummies* are indicator variables for S&P's rating categories. *Issuer Fixed Effects* are indicator variables for issuers. Robust standard errors clustered at issuer level are in parentheses. ***, ** and * indicate statistical significance at the 1%, 5%, and 10 % level, respectively.

	(1)	(2)	(3)	(4)
Ln(Short-term Debt)	0.254***			
	(0.0844)			
Past-4-quarter Fraction of Bond Issue Volume Rated by S&P		-1.535**		
		(0.775)		
Past-8-quarter Fraction of Bond Issue Volume Rated by S&P			-1.390	
			(0.884)	
New CFO (t-1)				0.980**
				(0.382)
New CFO (t)				0.849**
				(0.428)
Ln(Long-term Debt)	0.838***			
	(0.214)			
Ln(Total Debt)		3.215***	3.120***	1.066***
		(0.641)	(0.575)	(0.312)
Ln(Sales)	-2.515***	-2.127***	-1.804***	-1.764**
	(0.500)	(0.563)	(0.498)	(0.825)
Tangibility	8.175**	13.11***	11.73***	9.971**
	(3.323)	(4.044)	(3.280)	(4.833)
R&D/Sales	0.0975	0.269	0.495	12.68***
	(1.285)	(0.794)	(1.000)	(4.673)
R&D Missing Dummy	-0.218	-0.0614	0.0736	3.080
	(0.436)	(0.562)	(0.445)	(1.979)
Market-to-Book	-0.689***	-1.591***	-1.234***	-0.660**
	(0.222)	(0.301)	(0.282)	(0.274)
Year Dummies	Yes	Yes	Yes	Yes
S&P Rating Letter Dummies	Yes	Yes	Yes	Yes
Issuer Fixed Effects	Yes	Yes	Yes	Yes
Observations	24157	2880	4869	3424
R-squared	0.152	0.237	0.211	0.211

Table 8: Endogeneity Robustness Test for Rating Inflation

This table presents results of fixed-effect OLS regression models. The dependent variable is *Inflation Magnitude* defined in Equation (2). *Ln(Long-term Debt Due)* is the logarithm of long-term debt that is due in one year; *Ln(Other Long-term Debt)* is the logarithm of total long-term debt minus long-term debt due in one year ; *Ln(Sales)* is the logarithm of sales; *Tangibility* is the ratio of net property, plant, and equipment to total assets; *R&D/Sales* is the ratio of R&D expense to sales, where R&D expense is replaced by 0 if missing; *R&D Missing Dummy* equals 1 if R&D expense is missing; *Market-to-Book* is the ratio of the market value of assets to total assets, where the numerator is defined as the sum of market equity and total debt; *Number of Analysts* is the number of analysts' reports on EPS in the last month of each quarter and *Standard Deviation of Analysts' Reports* is the standard deviation of analysts' reports on EPS in the last month of each quarter. All above variables are measured at time t-1. *Year Dummies* are indicator variables for the fiscal years. *S&P Rating Letter Dummies* are indicator variables for S&P's rating categories. *Issuer Fixed Effects* are indicator variables for issuers. Robust standard errors clustered at issuer level are in parentheses. ***, ** and * indicate statistical significance at the 1%, 5%, and 10 % level, respectively.

	(1)	(2)
Ln(Long-term Debt Due)	0.166***	0.225***
	(0.0629)	(0.0564)
Ln(Other Long-term Debt)	0.724***	0.906***
	(0.171)	(0.217)
Ln(Sales)	0.0538	-2.001***
	(0.209)	(0.410)
Tangibility	-0.299	4.782*
	(0.913)	(2.482)
R&D/Sales	2.863	4.417*
	(1.988)	(2.481)
R&D Missing Dummy	-0.0657	0.382
	(0.396)	(0.422)
Market-to-Book	-0.579***	-0.455**
	(0.183)	(0.183)
Number of Analysts	-0.142***	-0.0578
	(0.0278)	(0.0417)
Standard Deviation of Analysts' Reports	1.031***	0.948***
	(0.388)	(0.220)
Year Dummies	Yes	Yes
S&P Rating Letter Dummies	Yes	Yes
Issuer Fixed Effects	No	Yes
Observations	17833	17833
R-squared	0.077	0.081

Table 9: Test for Selection Bias

This table presents results of the Heckman selection models. The dependent variable in the first-stage regression is *Rating Shopping Dummy* that equals 0 if an issuer has three published ratings from S&P, Moody's and Fitch, and equals 1 if it only has a published rating from S&P. The dependent variable in the second-stage regression is *Inflation Magnitude. Ln(Long-term Debt)* is the logarithm of long-term debt; *Ln(Short-term Debt)* is the logarithm of short-term debt; *New CFO (t)* equals 1 for the fiscal year when an issuer appoints a new CFO, and equals 0 otherwise; *New CFO (t-1)* is the one-year lag of New CFO (t). *Ln(Sales)* is the logarithm of sales; *Ln(Asset)* is the logarithm of total asset; *Tangibility* is the ratio of net property, plant, and equipment to total assets; *R&D/Sales* is the ratio of R&D expense to sales, where R&D expense is replaced by 0 if missing; *R&D Missing Dummy* equals 1 if R&D expense is missing; *Market-to-Book* is the ratio of the market value of assets to total assets, where the numerator is defined as the sum of market equity and total debt; All above variables are measured at time t-1. *Fitch Push* is a dummy variable that equals 1 if one of S&P and Moody's ratings is or is below "BB+" and the other is above "BB+", but Fitch's rating is above "BB+". *ROA* is the ratio of operating income before depreciation to total assets; *Past 5-year ROA Volatility* is the volatility of ROA in the past 5 years. *Year Dummies* are indicator variables for the fiscal years. *S&P Investment Grade Dummy* equals 1 if S&P's issuer rating is above "BB+". Robust standard errors clustered at issuer level are in parentheses. ***, ** and * indicate statistical significance at the 1%, 5%, and 10 % level, respectively.

	(1)	(2)	(3)	(4)
	2nd	1st	2nd	1st
Ln(Short-term Debt)	0.557***	-0.0477***		
	(0.0760)	(0.00609)		
New CFO (t-1)			1.176*	-0.0212
			(0.643)	(0.0696)
New CFO (t)			2.129***	-0.0537
			(0.664)	(0.0726)
Ln(Long-term Debt)	1.573***	-0.146***		
	(0.152)	(0.0130)		
Ln(Total Debt)			2.243***	-0.282***
			(0.418)	(0.0454)
Ln(Sales)	-0.555***	-0.122***	-1.567***	-0.132***
	(0.203)	(0.0192)	(0.392)	(0.0477)
Tangibility	2.029***	-0.327***	-1.435	-0.201
	(0.690)	(0.0571)	(1.338)	(0.145)
R&D/Sale	3.832*	-0.152	-0.0400	0.183
	(2.200)	(0.210)	(3.189)	(0.397)
R&D Missing Dummy	0.106	0.0340	0.399	0.0638
	(0.303)	(0.0274)	(0.561)	(0.0637)
M-B Ratio	-1.227***	0.211***	-0.614**	0.183***
	(0.137)	(0.0163)	(0.277)	(0.0410)
Ln(Asset)		-0.202***		-0.0853
		(0.0251)		(0.0702)
Fitch Push		0.135***		0.137
		(0.0410)		(0.0916)
ROA		-1.775***		1.322
		(0.546)		(1.747)
Past 5-year ROA Volatility		-4.965***		-4.346
		(1.083)		(2.915)
Year Dummies	Yes	Yes	Yes	Yes
S&P Investment Grade (Letter) Dummies	Yes	Yes	Yes	Yes
Issuer Fixed Effects	No	No	No	No
Lambda	-6.189***		-1.625	
	(1.137)		(2.348)	
Observations	14341	14341	2567	2567

Table 10: Test for Inflation Tendency

This table presents results of logit models. The dependent variable is *Inflation Tendency* defined in Equation (1). *Ln(Long-term Debt)* is the logarithm of long-term debt; *Ln(Short-term Debt)* is the logarithm of short-term debt; *New CFO (t) equals 1 for the fiscal year when an issuer appoints a new CFO, and equals 0 otherwise; New CFO (t-1) is the one-year lag of New CFO (t). Past-n-quarter Fraction of Bond Issue Volume Rated by S&P* is the offering amount of bonds issued by an issuer during the past n quarters that are rated by S&P as a fraction of those that are rated by the major three rating agencies (S&P, Moody's and Fitch) in total. *Ln(Total Debt)* is the logarithm of total debt; *Ln(Sales)* is the logarithm of sales; *Tangibility* is the ratio of net property, plant, and equipment to total assets; *R&D/Sales* is the ratio of R&D expense to sales, where R&D expense is replaced by 0 if missing; *R&D Missing Dummy* equals 1 if R&D expense is missing; *Market-to-Book* is the ratio of the market value of assets to total assets, where the numerator is defined as the sum of market equity and total debt. All above variables are measured at time t-1. *Year Dummies* are indicator variables for the fiscal years. *S&P Rating Letter Dummies* are indicator variables for S&P's rating categories. *Issuer Fixed Effects* are indicator variables for issuers. Standard errors are in parentheses. ***, ** and * indicate statistical significance at the 1%, 5%, and 10 % level, respectively.

	(1)	(2)	(3)	(4)
Ln(Short-term Debt)	0.136***			
	(0.0284)			
Past-4-quarter Fraction of Bond Issue Volume Rated by S&P		-0.578**		
		(0.255)		
Past-8-quarter Fraction of Bond Issue Volume Rated by S&P			-0.418*	
			(0.246)	
New CFO (t-1)				0.250*
				(0.132)
New CFO (t)				0.449***
				(0.130)
Ln(Long-term Debt)	0.514***			
	(0.0909)			
Ln(Total Debt)		1.506***	1.594***	0.938***
		(0.175)	(0.134)	(0.154)
Ln(Sales)	-0.982***	-1.203***	-1.234***	-1.286***
	(0.0656)	(0.182)	(0.145)	(0.232)
Tangibility	1.364***	2.216**	3.269***	2.243**
	(0.369)	(1.034)	(0.784)	(1.027)
R&D/Sale	1.520***	6.392***	1.698	5.218**
	(0.492)	(2.272)	(1.391)	(2.433)
R&D Missing Dummy	-0.0217	0.155	0.0209	-0.0684
	(0.0843)	(0.221)	(0.171)	(0.403)
Market-to-Book	-1.190***	-1.622***	-1.706***	-1.306***
	(0.0564)	(0.155)	(0.129)	(0.157)
Year Dummies	Yes	Yes	Yes	Yes
S&P Rating Letter Dummies	Yes	Yes	Yes	Yes
Issuer Fixed Effects	Yes	Yes	Yes	Yes
Observations	20345	3938	6454	2771
Pseudo R-squared	0.183	0.206	0.215	0.262