Conflict of Interests in Investor-paid Credit Ratings *

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Abstract

This paper investigates whether an *investor-paid* credit rating model leads to rating inflation. Using the corporate bond ratings of Egan-Jones Rating Company, I find evidence that an investor-paid rating agency tends to upgrade bonds that offer a higher yield. This suggests that an investor-paid rating agency can cater to the needs of the investors who *reach for yield* allowing them to bypass capital requirements of holding such bonds. This result support the theory that rating-contingent regulations in financial markets create incentives for inflated ratings, regardless of compensation structure of rating agencies.

Keywords: rating-based regulations, reaching for yield, credit ratings

JEL Codes: G18, G24, L43, L51

1 Introduction

Most of the criticism about credit rating agencies (CRAs) after the 2008 financial crisis, has been revolving around the conflict of interest inherent to their *issuer-paid* business model: The very issuer that is being evaluated for its creditworthiness is also paying for the rating services. As a result, the interests of CRA are in conflict with those of the investors who are a consumer of the information provided by the credit rating. Defects of such compensation structure have been discussed in virtually every debate on the topic as a root cause of the recent financial crisis (see White, 2002; Partnoy, 2009; Frank, 2010, for some of these arguments).

In response to this problem, policy-makers have since implemented several measures to target such conflict of interests and its undesirable consequences. The Dodd-Frank Act in the United States as well as European regulations of CRAs aimed at improving accountability and

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transparency of CRAs (U.S. Securities and Exchange Commission, 2014). These legislations introduced measures to reduce the dependence of financial system on credit ratings and break the dominance of largest CRAs, namely Moody's, S&P and Fitch. In particular, financial authorities in Europe and the United States, have facilitated entry of new rating agencies into the market (Frank, 2010; The European Union, 2013). Further, they have also mandated CRAs to follow a more strict disclosure policy of conflicts of interests by disclosing whether the rating is issuer-paid or not .

Motivation Although the conflict of interest of *issuer-paid* CRAs has received considerable scrutiny, little attention has been paid to the strategic behavior and incentives of *investor-paid* CRAs. The premise of an investor-paid business-model is that since an investor-paid CRA is compensated by the investors rather than issuers, it does not present the same problem of conflicting interests. As a result, CRAs with an investor-paid model have been considered as more reliable in providing unbiased ratings as they do not show the immediate conflict of interest inherent to their issuer-paid counterparts (Beaver et al., 2006; Bruno et al., 2016; Xia and Strobl, 2012; Xia, 2014).

Credit ratings are deeply embedded in the functioning of financial markets and investors use credit ratings not only for information acquisition, but also have a *regulatory demand* for ratings. In this paper, I argue that compensation structure of an investor-paid CRA can create incentives for biased rating as well. Such incentives arise due to *rating-contingent capital requirement regulations* of major institutional investors. The general line of reasoning, as I will explain the main channels below, is that investors have a demand for relief from the regulatory constraints. Therefore, an investor-paid rating agency might be susceptible to provide regulatory relief to its clients via credit ratings that ease those constraints. Thus, an investor-paid CRA exhibits conflicts of interests, not with investors or issuers, but with the regulator.

Two channels through which investors' demand for inflated ratings emerges are the followings: (i) Rating-contingent capital requirements that create a demand for regulatory relief through inflated ratings. (ii) Propensity of investors to reach for yield which create a demand for inflation of ratings for higher yield securities. I explain these two channels in further details below.

Rating-contingent regulation of capital requirements Regulatory demand for rating stems from the rating-contingent regulation of capital requirements imposed on large institu-

tional investors and banks. The most significant regulations leading to use of credit ratings is the implementation of the Basel Accord which requires major investors such as banks and insurance companies to keep a risk-weighted percentage of their assets as regulatory capital (BCBS, 2006, 2010). [1] Rating-based capital requirements create several frictions on the side of investor(Ellul et al., 2010; Harris et al., 2014; Board of Governers of the Federal Reserve, 2019). When capital requirements depend on credit ratings, investors seek relief by demanding higher ratings for securities that they hold or intend to hold.

Reaching for yield When regulations are based on credit rating, investors have the propensity to pursue higher returns by selecting identically rated securities that have higher risk (Rochet, 1992; Pennacchi, 2006; Becker and Ivashina, 2015; Iannotta et al., 2019; Efing, 2019). Several arguments could explain the reaching for yield behavior of investors. Iannotta et al. (2019) provide theoretical arguments and empirical evidence that such incentives are intensified due to the moral hazard problems. Furthermore, taking more risk and reaching for yield is exacerbated when managers are evaluated based on imperfect measures by their shareholders. In particular, a considerable number of insurance companies outsource their asset management and yields are used by shareholders to measure the performance of asset managers (Becker and Ivashina, 2015; NAIC, 2011).

Research question Taken together, investors' propensity to take higher risk by reaching to bonds with higher yield and their desire for relief from capital requirement regulations create a demand for inflated ratings. A CRA that is compensated by the investors might as well find it profitable to supply a rating service that offers relief from the capital requirements and accommodates reaching for yield.

The aim of this paper, therefore, is to investigate whether an investor-paid CRA cater to demands of investors for regulatory relief and reaching for yield. To answer this question, this paper follows an empirical approach by focusing on the rating behavior of Egan-Jones Rating Company [2], an investor-paid credit rating provider in the corporate bonds market in the United States 2013-2015 period. Studying the corporate bonds market is ideal because the largest buyers of corporate bonds in the U.S. are insurance companies. More importantly,

[1] The standard approach of calculation of credit risk however is dependent on credit ratings and requires a higher weight of credit risk for assets that have a worse rating. For example the risk weight of rated claims depends on their credit rating (Bank for International Settlements, 2004), putting a weight of 20% on AAA-rated corporate securities and a weight of 150% on securities rated below $BB-$.

[2] www.egan-jones.com

insurance companies are subject to rating-contingent regulations in which the credit ratings of EJ are used.

Methodology The main hypothesis that I test in this paper is that an investor-paid rating agency caters to the investors by inflating the ratings of bonds that are more attractive for them. The empirical implication of this hypothesis is that since investors' have a propensity to reach for yield among those bonds that they target (mostly safer bonds), we expect to observe a stronger probability of upgrade for bonds that offer higher yield. To empirically test such hypothesis, I measure the effect of *yield spread* of bonds on the rating outcome of EJ controlling for a large set of bond and issuer characteristics. Moreover, I compare the determinants of ratings between EJ and Moody's to establish whether their rating behaviors in general and specifically regarding the effect of yield spreads differ. Empirical tests rely on a set of regression analysis on a sample of rating data on corporate bonds between 2013:Q3 an 2015:Q3.

Empirical results In a first set of regressions, I look at the behavior of EJ after for recently issued bonds. I fit an ordered logit model in which the choice of rating category by the CRA is modelled as a function of bond and issuer characteristics. Consistent with the hypothesis that a higher yield leads to a better rating outcome by EJ, I find that bonds that belong to the highest quartile of yield spread are the most likely to receive a better rating compared to the lowest quartile. Next, I compare the rating determinants of EJ and Moody's and establish that the positive effect of yield spread on rating outcome is specific to EJ and is not observed for Moody's. The main result of the current study, therefore, is empirical evidence that EJ assigns better ratings to bonds with higher yields, conditional on a large set of bond and issuer characteristics. Moreover, the positive relation is stronger for bonds that are close to the Investment-grade barrier. Such association is not observed for Moody's, an issuer-paid CRA.

Contributions The main contribution of this paper, therefore, is providing empirical evidence and economic arguments that regardless of compensation structure, CRAs face an incentive to produce inflated ratings. Importantly, as shown previously by Opp et al. (2013); Efing (2013); Iannotta et al. (2019), the main channel through which such incentives are created are rating-contingent regulations of capital requirements. This paper also contributes to the literature concerned with the effects of regulatory certification role of CRAs. A series of papers have discussed whether an NRSRO status would affect the quality of ratings of a CRA (Beaver et

al., 2006; Bruno et al., 2016; Opp et al., 2013) with mixed results. In a previous study of EJ's rating behavior, Bruno et al. (2016) investigate whether obtaining an NRSRO status by EJ affects its rating quality. Their general conclusion is that obtaining the NRSRO status did not have a material effect on the quality of ratings by EJ. However, in their definition of rating quality they mostly focus on timeliness and bias of credit ratings by EJ. Moreover, they show that, in comparison to Moody's, EJ was faster to respond to changes in economic environments (timeliness) and more symmetric in terms of response to good or bad news (unbiasedness). Current paper thus contributes to this line of literature in support of the theory that regulatory certification could decrease rating quality.

2 Institutional Settings

Credit ratings and rating-based regulations Major financial institutions with liabilities to the general public, such as banks and insurance companies, are subject to financial regulations that require them to maintain a reserve of capital as a function of the risk of their investments. These regulations limit the ability of these institutions to take excess leverage and control their risk of becoming insolvent. In particular, calculation of capital requirements depend on the measures of credit risk of assets held by financial institutions (BCBS, 2006, 2017). Basel accord permits two main methodologies to calculate credit risk: Internal and External (or Standardized) rating methods. [3] In the vast majority of cases, however, the institutional investors are required to use ratings from external Credit Rating Agencies (CRAs). These ratings then are used to calculate the required capital for credit risk that investors need to hold.

Corporate bonds market To answer the research questions of this paper, I focus on the corporate bond market in the United States. The bond market is particularly relevant for the purposes of this study because the main investors in this market are subject to rating-based regulations. The largest holders of corporate bonds are banks, insurance companies and pension funds with a total share of 58% (Celik et al., 2015). Institutional investors are also an important player in debt instruments markets in other countries as well. According to SIFMA (2020), in 2014 the outstanding amount of long-term corporate bonds in the United States was more than $8 trillion. This is more than 20% of total fixed income debt in the United States and the third

[3] The internal method allows the financial institutions to use their own calculation of credit risk. However only those institutions who meet a certain set of criteria are allowed to calculate the credit risk of their holdings using the Internal method.

largest category after U.S. Treasury and Mortgage-Backed securities. The net growth of this market has been an average of more than $300B per year between 2013 and 2015.

Insurance companies and NAIC Regulations More than 30% of all investment-grade corporate bond issues in the United States are held by the the insurance companies(Celik et al., 2015; Schultz, 2001). Most of regulatory control of the industry takes place at the state level and is coordinated across states through an industrial association, National Association of Insurance Commissioners (NAIC), appointed by the state regulators. [4] NAIC is the U.S. standard-setting and regulatory support organization consisted of the chief insurance regulators across the U.S. To oversee the capital requirement regulations, NAIC formulates a set of rules and guidelines for calculation of risk-based capital requirements that the insurance companies need to follow. It is important to note that NAIC is not a regulatory body but a forum for self-regulation of the insurance industry. The authority to regulate remains with each state. Therefore it acts as a coordinating institution helping the industry.

NAIC follows several policies on the use of credit ratings. According to NAIC (2017), it is required that insurance companies use the credit ratings provided by eligible CRAs that have been approved by SEC. Currently 9 CRAs have the status of Nationally Recognized Statistical Rating Organisation (NRSRO). A NRSRO status allows the ratings of a CRA to be used in financial regulations. [5] The main credit rating providers for the insurance companies are 8 rating agencies all with NRSRO status. [6]

Most importantly, the capital requirement calculations for corporate bonds [7] are based on credit ratings provided by approved credit rating agencies. As rating definitions of each rating category used by CRAS might differ, NAIC translates the ratings of CRAs to its own NAIC1 to NAIC6 format with NAIC1 being the safest and NAIC6 the riskiest. [8] Each NAIC category is associated with a risk-based capital charge that is used as a basis for calculation of capital

[4] In the U.S. the main regulatory bodies are the Federal Reserve Board, Federal Deposit Insurance Corporation (FDIC) and Office of Comptroller of the Currency (OCC). However, NAIC is the main regulatory support organization created and governed by the chief insurance regulators of each state.

[5] After the early regulations of financial institutions in the United States in 1970's, the term NRSRO started to be used. This status, gave widespread use of and reliance on credit ratings provided by those CRAs with NRSRO status in financial markets.

[6] Among these CRAs, NAIC accepts ratings of Moody's Investor's Service, Standard and Poor's, Fitch Ratings, Dominion Bond Rating Service (DBRS), A.M. Best Company (A.M. Best), Morningstar Credit Ratings, LLC (for All Structured Finance Securities), Kroll Bond Rating Agency and Egan Jones Rating Company.

[7] as well as Government and Municipal bonds and preferred stocks

[8] Insurance companies might also hold unrated securities for which they need to file a report to NAIC. Such securities need to be analysed by the Securities Valuation Office (SVO) in order to determine the risk and corresponding Risk-Based Capital (RBC).

requirements. Table 1 indicates how NAIC translates the alphanumerical credit ratings issued by CRAs into the NAIC1 to NAIC6 rating categories. For $100 invested in corporate bonds rated NAIC1, the insurer has to hold $0.4 in equity capital. For the same amount of investment in bonds with NAIC3 rating, the equity capital that the insurer needs to hold would be $4.6.

NAIC category	Numeric	Moody's	S&P	Fitch	Egan-Jones	Capital charges
NAIC1	1	Aaa	AAA	AAA	AAA	0.4 %
	2	Aa1	AA+	AA+	AA+	
	3	Aa2	AA	AA	AA	
	4	Aa3	AA-	AA-	AA-	
	5	A1	A+	A+	A+	
	6	A2	A	A	A	
	7	A3	A-	A-	A-	
NAIC2	8	Baa1	BBB+	BBB+	BBB+	1.3 %
	9	Baa2	BBB	BBB	BBB	
	10	Baa3	BBB-	BBB-	BBB-	
NAIC3	11	Ba1	BB+	BB+	BB+	4.6 %
	12	Ba2	BB	BB	BB	
	13	Ba3	BB-	BB-	BB-	
NAIC4	14	B1	B+	B+	B+	10 %
	15	B2	B	B	B	
	16	B3	B-	B-	B-	
NAIC5	17	Caa1	CCC+		CCC+	23 %
	18	Caa2	CCC	CCC	CCC	
	19	Caa3	CCC-		CCC-	
NAIC6	20-21	Ca, C	CC	CC to D	CC,C,D	30 %

Equivalent NAIC rating categories for each rating agency and corresponding capital requirement for an asset in each category. Capital requirements are determined as a weighted sum of investment in all risk categories. For corporate bond investments capital charges in the last column above are used as weights.

Table 1: Rating categories and capital charges

The NAIC RBC formula generates the regulatory minimum amount of capital that a company is required to maintain to avoid regulatory action. There are four levels of action that a company can trigger under the formula: company action, regulatory action, authorized control and mandatory control levels. Each RBC level requires some particular action on the part of the regulator, the company, or both. For example, an insurer that breaches the Company

Action Level must produce a plan to restore its RBC levels. This could include adding capital, purchasing reinsurance, reducing the amount of insurance it writes, or pursuing a merger or acquisition. Importantly, NAIC regulations require the ratings to be eligible if they meet certain criteria including that the credit rating are monitored at least annually by the CRA that issued the rating. Securities that meet the required criteria are exempt from being reported to NAIC.

Split ratings and NAIC regulation Very often, corporate bonds receive ratings from more than one CRA and naturally these ratings could differ from each other. NAIC provides guidelines to decide the *effective* rating. Quoting the NAIC report: "Bonds assigned Eligible NAIC CRP Ratings will be assigned the equivalent NAIC Designation. If two Eligible NAIC CRP Ratings have been assigned, then the lowest rating will be assigned. In case of a security assigned three or more Eligible NAIC CRP Ratings, the Eligible NAIC CRP Ratings for the security will be ordered according to their NAIC equivalents and the rating falling second lowest will be selected, even if that rating is equal to that of the first lowest." [9] This definition has direct implications for the empirical tests in this paper as it determines the capital requirements for a specific bond and potential for regulatory relief followed by an upgrade.

Egan-Jones Ratings Company Among the recent players in the credit rating markets is *Egan-Jones Rating Company*(EJ) which is distinguished from other CRAs in the market as it follows an *Investor-paid* business model. EJ offers proprietary rating classification of securities and corporations and is compensated by the investors rather than the issuers. EJ states that it started its services "for the purpose of issuing timely, accurate ratings". [10]

EJR states that the ratings are its " [...] opinion of the creditworthiness of financial obligations" by considering several sources of information. [11] Regarding the rating, EJ states that "credit ratings are expressed in terms of default risk". More specifically, EJ's current rating for long-term obligations indicate EJ's opinion of credit quality over the next 6 to 12 months (Egan-Jones Ratings, 2016). Overall this indicates that EJ, similar to its issuer-paid peers states an objective of providing a forward-looking rating opinion that is informative of credit quality and creditworthiness of an obligation (Fitch Ratings, 2018; Moody's, 2018; Standard and Poor's, 2019).

In December 2007 and after the sub-prime crisis in the U.S EJ was approved by SEC as a

[9] See https://www.naic.org/documents/committees_e_rea_wg_related_showing_all_fe_text.pdf
[10] see https://www.egan-jones.com/
[11] https://ejratings.com/static/pdf/methodologies/EJR_Methodologies_JUN102016.pdf

Nationally Recognized Statistical Rating Organization (NRSRO). It was also subsequently registered by ESMA in December 2014 to perform its activities in Europe as well. The NRSRO status allows the ratings to enter in the financial decision making processes of market participants. Similar status applies to EJ as ratings of all CRAs registered by ESMA can be used for regulatory purposes according to EU legislations.

3 Hypothesis

When regulations are contingent on credit ratings, an inflation in credit rating could provide regulatory relief to investors by reducing their capital requirement charges. In this paper I argue that an investor-paid CRA has an incentive to cater to their clients by producing ratings that provide regulatory relief for the investors. I develop my hypothesis based on two main arguments that I provide below.

First, inflated ratings by an investor-paid CRA cater to the investors by decreasing their capital requirement charges. Rating-contingent capital requirements of Basel agreement on banks or NAIC risk-based capital requirements of insurance companies could significantly increase with a worse rating (BCBS, 2006; NAIC, 2019). As describe in table 1, a downgrade from NAIC risk category 2 to 3 could increase the charges by a factor of 3.4. Besides the direct costs of such regulations, some investors might face larger foregone value due to their inability to hold such securities. As shown empirically in the literature by Ellul et al. (2010), a downgrade could trigger *fire sale* of securities. In such environment, regardless of the quality of information attached to the credit rating, a CRA can capture at least a part of the value generated for the investors due to a higher credit rating (Opp et al., 2013; Efing, 2013; Iannotta et al., 2019).

Second, an investor-paid CRA can cater to the investors by accommodating their demand for higher yield bonds in each rating category. Since credit ratings only constraint investors in one dimension of risk, investors take in more risk in other dimensions by reaching for higher yield securities within the credit rating limits (Rochet, 1992; Becker and Ivashina, 2015; Efing, 2019). This creates a demand for inflated ratings for such securities.

Therefore the main hypotheses that I empirically test in this paper are the following:

i An investor-paid rating agency assigns better ratings to bonds with higher yield.

ii The positive association of higher yields and better rating outcome is specific to investor-paid CRA (EJ) and not to its issuer-paid counterpart (Moody's).

4 Data

Two main data sources have been used in this paper. The historical rating data are publicly provided by the CRAs under the mandates of rule 17g-7 of SEC in 2012 [12] which requires all CRAs with NRSRO status to publish all their rating actions with a delay of maximum two years. [13] The second dataset that has been used is the bond and issuer data provided by S&P Capital IQ platform. In addition, I use as complementary sources, the Federal Reserve Economic Data (FRED) for time series data on treasury bill returns as well as Trade Reporting and Compliance Engine (TRACE) for trade volume and prices of bonds.

Filtering The following filters have been applied to the data. I restrict the duration of the sample between the third quarter of 2013 and the third quarter of 2015. Only bonds that have been issued in the United States and in the local currency are considered. All observations with ratings that have been assigned more than a month prior to issuance of a bond are dropped.

I only consider those bonds issued by public companies. The first reason for this filtering is that the financial data of private companies are frequently unavailable which hinders possibility of controlling for issuer characteristics. Second, since EJ is an investor paid rating agency, it does not have the same level of access to the financial information of an issuer as an issuer-paid CRA. Such difference in access to the information might contaminate the results as any observed difference in ratings could be attributed to difference in access to the information by the CRAs rather than their incentive structure. Considering public companies minimizes this concern.

Only Senior Unsecured bonds with fixed coupon rate are considered and variable or zero coupon bonds are removed. Restricting the data to bonds that are not callable is too prohibitive as almost 80% of bonds are callable therefore I keep both callable and not callable bonds and control for the difference in all the regression analysis. However, as I mentioned above, all yield and spread variables are computed considering whether the bond is callable or not. In particular, for a callable bond, the proper measure of yield is yield to worst which are obtained and used for all callable bonds.

Observations with outlier issue characteristics, importantly yield and spread, are Winsorized

[12] See https://www.sec.gov/ocr/disclosure-of-credit-rating-histories.html

[13] These ratings are however published using xbrl format which needs to be parsed. This process has been done using a (modified) version of a script originally made available by Center for Municipal Finance available at https://github.com/govwiki/rating_history.

at the 0.5% level to ensure that extreme values are not driving the results.

Descriptive statistics of Ratings The historical ratings dataset provides information on rating agency name, rating date, rating, identification of rated security, whether the rating has been paid by the issuer or not. Moreover, it includes a *rating action* variable that describes whether this is the first time that the CRA is rating such security, whether the rating is an upgrade, downgrade or affirmation of previous rating and finally, whether the rating has been withdrawn or extinguished. [14] The dataset provides security identification number, CUSIP[15], that allows linking to the other datasets.

An observation is recorded each time a CRA performs a rating action. It is important to note that the frequency at which CRAs take a rating action differs among them. However, assigning a credit rating is not a one time action. A credit rating received by an entity or a security comes with a process of rating follow-up through which a rated entity is continuously examined by the CRA. At any moment, upon a significant change in creditworthiness of the rated entity or the security, the assigned rating could change (see Langohr and Langohr, 2010, Ch.4). A rating action, thus, is performed only if the CRA decides to do so. [16] In the data, EJ performs rating actions far more frequently than other CRAs. On average, Moody's update its rating every 241 days while EJ does so every 83 days. However, the number of issues that they have rated are much close with 2029 for Moody's and 1912 for EJ. This difference in rating frequencies is important. As explained in section 2, NAIC regulations require the credit ratings to be monitored at least yearly. A failure of Moody's to evaluate a security within one year therefore might make its rating ineligible for the purposes of regulations.

Out of these ratings 768 bonds are newly issued.

Descriptive statistics of Bonds To obtain characteristics of bonds, I use S&P's CapitalIQ platform that allows extraction of data using the bond identifier. Bond characteristics include

[14] Moody's does not rate an obligation that is in default but other rating agencies assign a rating letter to such securities.

[15] CUSIP stands for Committee on Uniform Securities Identification Procedures. A CUSIP number identifies most financial instruments, including: stocks of all registered U.S. and Canadian companies, commercial paper, and U.S. government and municipal bonds. see https://www.sec.gov/answers/cusip.htm

[16] The *rating follow-up* is an important aspect of rating services after the initial rating has been assigned and it aims at keeping the ratings up-to-date as well as giving feedback to the rated entity. Rating follow-ups could take several forms. The potential direction of the credit rating of an entity over the intermediate term (six months to two years) is indicated by a *rating outlook*. Similarly, *rating reviews* give a stronger indication of future changes of ratings than outlooks (see Langohr and Langohr, 2010, pp.174-179). Neither rating outlooks nor reviews necessarily mean that the rating will change, however, their mere presence indicates that the creditworthiness of the rated entity is being followed up by the rating agency. Therefore, unless the rating agency decides that the status of the firms has changed in a substantial way that requires a transition, the initial rating still holds.

	Moody s		Egan Jones		Total	
	N	%	N	%	N	%
NAIC 1	410	18.3	8911	52.6	9321	48.6
NAIC 2	994	44.3	4934	29.1	5928	30.9
NAIC 3	347	15.5	2147	12.7	2494	13.0
NAIC 4	300	13.4	771	4.6	1071	5.6
NAIC 5	158	7.0	140	0.8	298	1.6
NAIC 6	34	1.5	39	0.2	73	0.4
Total	2243	100.0	16942	100.0	19185	100.0
N	19185					

Credit Actions by each CRA to the issues during the sample period in terms of NAIC categories.

Table 2: Summary statistics of ratings

	count	mean	sd
Moody's	5911	2.25	1.12
EJ	17879	1.74	0.94
Observations	19701		

Table 3: Summary statistics of ratings in terms of NAIC category

time invariant variables such as offering date, maturity date, offering amount, coupon rate, whether the bond is callable, seniority level, etc. Time variant characteristics, such as duration and convexity, are computed at each time the bond has received a rating from any CRA. In particular, the dataset provides yield and spread calculations for each bond at the time of a rating. [17]

Spread is calculated as the difference between the yield of a bond and yield of a matched Treasury Bill with the same maturity. For callable bonds, spread to worst is the relevant measure of spread which is provided in the data. A summary of issue characteristics during the sample period is provided is table 4.

It is important to note that the appropriate measure of yield for investors is yield to maturity and not coupon rate.

More than 80% of bonds in the sample are callable and removing them would have been too restrictive. A callable bond can be called by the issuer before its maturity date which means the full potential of investment in such bond might not be realized. For such bonds, an appropriate measure of yield is *yield to worst* which is a calculation of yield based on the assumption that the bond is called by the issuer before its maturity. To account for this issue, I use the yield to worst measure of yield for callable bonds and control for callability of a bond in the regressions.

[17] For callable bonds the relevant measure of yield is yield to worst which is provided as well.

	min	p25	mean	p75	max	sd
Yield (pct)	0.24	2.07	3.75	4.73	39.63	3.22
Spread	-17.00	77.00	188.07	208.00	3774.00	298.50
Coupon rate	0.45	4.70	5.75	7.00	15.00	1.80
Issue maturity (years)	3.00	10.01	17.36	30.02	100.07	12.16
Duration	0.02	2.80	6.33	9.43	22.23	4.43
Convexity	0.00	0.10	2.33	1.25	212.96	15.04
Callablity	0.00	1.00	0.82	1.00	1.00	0.38
Observations	13506					

This table displays the summary statistics of bonds who have received a rating during the sample period of 2013:Q3 and 2015:Q3. *Yield* represents the promised yield of a bond to maturity. *Spread* is the difference between the yield of a bond and a Treasury bill with similar maturity. *Coupon rate* represent the coupon rate of the bond. *Issue maturity* represents the years between the time that the bond reaches maturity and the time it was issued given that it does not default. *Duration* Measures the price sensitivity of the bond with respect to changes in interest rate. *Convexity* Measures how fast the price of a bond changes with respect to a change in interest rate. *Callability* is a binary variable and represents whether the bond is callable before it reaches maturity.

Table 4: Summary statistics of bond characteristics.

	min	p25	mean	p75	max	sd
Price volatility	8.48	16.87	24.65	28.34	282.31	13.29
Beta	-96.01	-0.67	0.05	2.24	70.81	13.19
Debt to equity	7.58	51.42	134.32	143.05	3935.48	215.56
Tangible to total assets	0.00	0.11	0.35	0.58	0.94	0.27
Return on asset	-30.16	2.00	4.87	7.59	27.08	5.23
Return on equity	-374.77	6.56	17.61	24.14	398.31	43.61
Total assets	170.10	1858.60	9920.01	8269.00	460743.00	27622.18
Observations	2295					

Price volatility is the price volatility of the equity of an issuer in the last 3 months prior to the observation. *Beta* is the slope of the regression line of the return of the stock relative to the S&P500 benchmark. *Debt to equity* is the ratio of total debt of the issuer to its total equity. *Tangible to total assets* is the ratio of book value of plants, properties and equipments to total assets of an issuer in the quarter of observation. *Return on assets* and *Return on equity* measure the return of asset and equity (%). *Total assets* is measured in $ millions.

Table 5: Summary statistics of issuer characteristics

Descriptive statistics of issuers Issuer characteristics are obtained by identifying the issuer of each bond using its CUSIP number. All issuer characteristics variables are extracted for the quarter in which a bond issued by the issuer has received a rating. These variables include total assets, return on assets, return on equity and financial ratios of leverage (debt to equity) and tangible to total assets ratio. Moreover, since only public companies have been considered, I obtain beta and idiosyncratic risk of the issuer for the quarter in which the bond offered by the issuer has received a rating from a CRA. A summary of issuer characteristics over the sample period is provided in table 5.

5 Results

5.1 Does EJ cater to investors by upgrading high yield bonds?

Focusing on ratings shortly after issuance Insurance companies obtain most of their bond holdings in the primary market (NAIC, 2014). They have been consistently among the largest buyers of corporate bonds at issuance NAIC (2013). It is therefore essential to look at the rating behavior of EJ for newly issued bonds. In the sample, out of 843 ratings that have been assigned at the time of issuance, Moody's has rated 89% and the rest belong to S&P and Fitch. EJ, on the other hand, almost never rated a bond at issuance in the sample. [18]

As reported by Becker and Ivashina (2015), insurance companies hold more than 70% of the newly issued bonds in categories of NAIC1 and NAIC2, more than 40% of issues rated NAIC3 and more than 30% of the issues rated NAIC4 out of all holdings of insurance companies, pension funds and mutual funds. Nevertheless, most of the bonds held by insurance companies are rated investment grade, i.e. NAIC categories 1 and 2. At the end of 2013, around 95% of corporate bond holdings of insurers have been rated investment grade. On average, 68% of their bond holdings had a NAIC1 rating and 27% NAIC2 NAIC (2013). Therefore, although insurance companies tend to have a considerable appetite for bonds that are *not* investment grade *at the issuance*, the overall composition of their bond holdings remain mostly investment grade.

Given the above characteristics of the insurance industry, therefore, focusing on the rating behavior of EJ for investment-grade bonds and around issuance becomes central to this investigation. As mentioned above, the main hypothesis that an investor-paid CRA caters to the investors relies on the argument that the capital requirement regulations induce the institutional investors to have a set of target credit rating categories when they make their investing decision. Thus, if there is any room for a biased rating behavior of an investor-paid CRA, it should be taking place for those bonds that are targeted by the investors. These are bonds that are rated investment grade at the issuance *and* have a higher yield spread. The empirical implication of the above argument is that upon catering behavior of EJ, it is expected that bonds with higher

[18] One explanation for this observation is that Moody's is an issuer-paid CRA with access to non-public information about the issue and the issuer. EJ, being an investor-paid firm, naturally does not have access to such information. The standard procedure of issuers is to closely work with the (issuer-paid) CRA that they have hired before the issuance (Langohr and Langohr, 2010). Naturally, an investor-paid CRA such as EJ that only relies on public information about an issue cannot provide a rating right at issuance and therefore displays a delay. Another explanation for this observation is that EJ provides rating services at the request of its clients, i.e. the investors. Therefore a bond can only be rated by EJ after it has been issued.

yield, controlling for other explanatory variables of a credit rating, receive a better rating.

To test this hypothesis, I run an ordered logit model in which the probability of outcome is estimated as a function of predictors. Note that a lower NAIC category corresponds to a better rating and therefore a negative coefficient implies prediction of a better outcome. [19] In order to test for the hypothesis that bonds with higher spread receive better rating from EJ, I include yield spread of a bond in the regression model to measure how different levels of yield spread affects EJ's credit rating outcome.

The variable *yield spread* is the difference between the yield of a bond and a matched Treasury bond with a similar maturity. However, it is likely that probability of a rating upgrade does not depend on the absolute value of the yield spread but rather on how a bond's spread in an effective NAIC rating category is compared to other bonds in that same category. To consider such distinction, I look at the quartile of the spread for each bond at each quarter and draw inference on the spread quartile rather than its absolute value. That is , for each *effective rating category* and for each quarter throughout the study period, bonds are ranked by their spread and spread quartiles are computed where bonds with lowest spread belong to the first quartile and bonds with highest spread belong to the fourth.

Table 6 presents the result of the regression on different sub-samples of *effective rating* for bonds that are rated by EJ near the issuance. Models (1) and (2) fit the data only on the NAIC categories of 1 to 3, those more interesting for insurance companies, while models (3) and (4) consider categories 3, 4 and 5. First we focus on those bonds that are more likely to be considered by the insurance companies, namely bonds that have received an initial (effective) rating of 1 to 3. Model (1) considers spread quartile of the bond as explanatory variable as well, while model (2) only relies on issuer and issue characteristics.

The results presented in table 6, are in line with the predictions that bonds with higher yield in the targeted categories are more likely to be upgraded. Negative coefficients of spread quartiles indicate that conditional on bond and issuer characteristics, a higher spread predicts a better rating by EJ. Specifically, we observe that the coefficient of the 4^{th} quartile of spread

[19] One of the assumptions behind ordered logistic regression is that the each pair of result groups exhibit the same relationship with each other. That is, ordered logistic regression assumes that the coefficients of prediction of outcome of the weakest categories relative to all of the top categories of the response variable are the same as those that describe the relationship between the immediately lower category and all higher categories, etc. This is called the proportional odds assumption or the parallel regression assumption (see Brant, 1990). Unfortunately performing a test for this assumption is not available for the model with categorical and time series variables, however, to minimize the possibility of error, I perform most of the estimations on different sub-categories of ratings as rating behavior is more likely to be different across investment and non-investment grade categories. In here, it is most relevant to interpret the coefficient as the effect of a variable on probability of a better rating.

is the largest in absolute value. That is, controlling for issue and issuer characteristics, those bonds who have the highest spread within a NAIC category are most likely to obtain a better rating.

Other explanatory variables show the expected signs. For example *return on equity* and *return on assets* are measures of firm performance and we expect that bonds issued by firms who exhibit better financial performance to have better credit risk. Both these variables have a negative sign and are statistically significant. Similarly, coefficients of *Total assets* and *Tangible to total assets* that measure financial stability of the firm have the expected sign. Both are negative and predict better rating outcome. Controlling for the financial structure of the firm, *Debt to equity* or leverage ratio has a positive coefficient as expected. Other variables are showing signs that are either not statistically significant or inconsistent across different specification indicating possible complex relationships that the statistical model is not capable of capturing.

5.2 Is there a systematic difference between ratings of Moody's and EJ around the issuance?

Although results in table 6 are indicative of evidence for catering behavior of EJ, they need to be validated in comparison with an issuer-paid CRA. Since the main hypothesis involving the conflict of interest in ratings of EJ relies on the effects of yield spread on the rating outcome, therefore testing the same hypothesis on the rating behavior of an issuer-paid counterpart is essential. This section extends the analysis by comparing the rating behavior of Moody's and EJ with a particular focus on how spreads affect the rating outcomes.

Directly comparing the ratings of EJ and Moody's reveal interesting patterns. Figure 1 presents the distribution of ratings assigned by EJ and Moody's on the same set of bonds during the study period. What is striking is the relative optimism of EJ in assigning NAIC1 to bonds that far exceeds that of Moody's. However, it seems that Moody's is more likely to assign a NAIC2 rating to a larger number of bonds compared to EJ.

One question that arises here is which one of the CRAs is more conservative in assigning a rating. At a first glance and in comparison, it is true that Moody's is an issuer-paid CRA and therefore might protect its clients from falling off the "credit cliff" (Kisgen, 2003; Boot et al., 2006; Manso, 2013), however in doing so it also faces a trade-off regarding its reputation (Wang, 2011; Mariano, 2012). In particular, this is true because given the issuer-paid model of Moody's, investors use Moody's ratings for the informational purposes. A loss of reputation

	(1) EJ	(2) EJ	(3) EJ	(4) EJ
EJ				
spread q=2	-0.773**		-1.093**	
	(0.319)		(0.554)	
spread q=3	-0.592		-2.082***	
	(0.366)		(0.733)	
spread q=4	-1.043**		-3.988***	
	(0.528)		(0.878)	
Issue size (log)	0.319	0.367	-1.077*	-0.641
	(0.262)	(0.260)	(0.597)	(0.599)
Convexity	-0.108**	-0.096**	-1.049**	-0.965**
	(0.054)	(0.047)	(0.477)	(0.470)
Duration	-0.074	-0.082	0.574**	0.349**
	(0.069)	(0.068)	(0.231)	(0.164)
Callablity=1	0.562	0.515	3.479***	3.363***
	(0.627)	(0.613)	(0.927)	(1.238)
Issue maturity (log)	1.419**	1.117*	-1.185	-1.116
	(0.619)	(0.611)	(1.189)	(1.127)
Price volatility	-0.022	-0.025*	0.062	0.011
	(0.015)	(0.015)	(0.053)	(0.052)
Beta	-0.012	-0.008	0.007	0.009
	(0.013)	(0.013)	(0.018)	(0.017)
Debt to equity	0.019***	0.018***	0.012***	0.011***
	(0.005)	(0.005)	(0.004)	(0.003)
Tangible to total assets	-3.845***	-3.564***	-2.151	0.444
	(1.220)	(1.197)	(2.280)	(1.786)
Total assets (log)	-0.920***	-0.829***	0.927	1.050*
	(0.312)	(0.304)	(0.593)	(0.616)
Return on asset	-0.208***	-0.193***	-0.389***	-0.202
	(0.078)	(0.073)	(0.137)	(0.161)
Return on equity	-0.047***	-0.046***	-0.087***	-0.073***
	(0.014)	(0.014)	(0.012)	(0.014)
Sample	NAIC1-3	NAIC1-3	NAIC3-5	NAIC3-5
Time dummies	Yes	Yes	Yes	Yes
Clusters (Issuer)	89.000	89.000	31.000	31.000
Pseudo R sq.	0.307	0.292	0.519	0.456
log Likelihood	-513.664	-530.615	-101.512	-114.657
N	768.000	778.000	194.000	194.000

The table presents the results of an ordered logit regression of NAIC rating category decided by EJ on a set of explanatory variables. Spread quartiles are indicator variables with spread quartile 1 indicating the lowest 25% of spreads and 4 indicating the highest. Spread quartile of 1 is omitted to avoid collinearity. Signs *, **, *** represent %10, %5 and %1 levels of statistical significance respectively. Standard errors are reported in parentheses and are clustered at the issuer level.

Table 6: Determinants of rating outcome by EJ shortly near issuance

for Moody's therefore could be very costly and as a result Moody's is expected to behave more conservatively under this assumption. On the other hand, if we consider the incentives of an

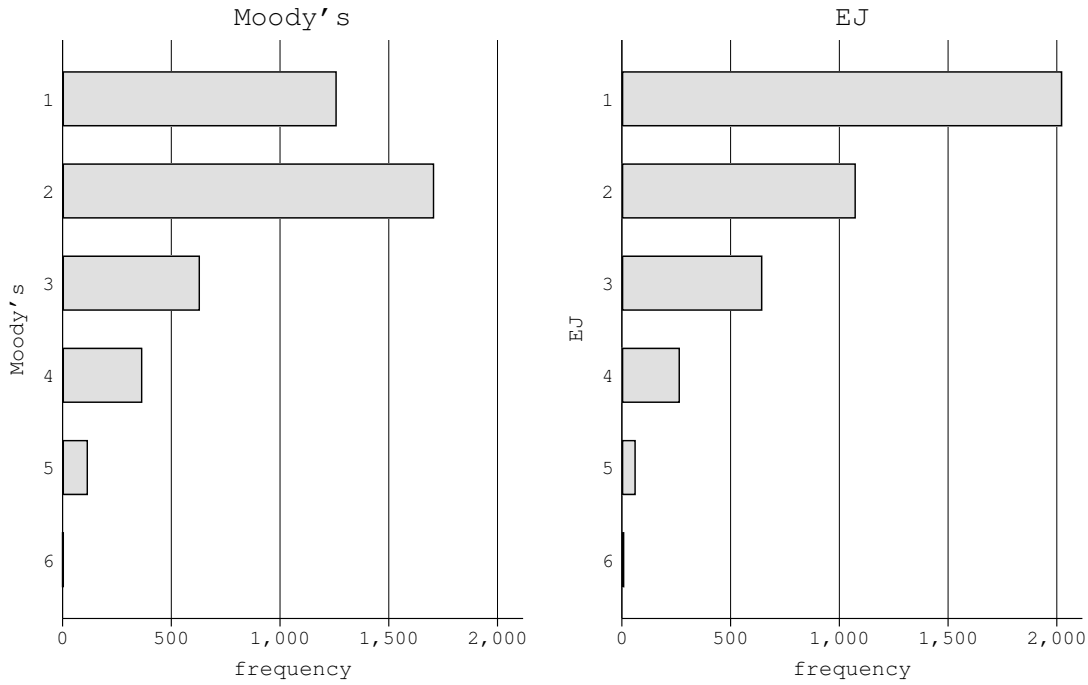

Figure 1: Distribution of ratings of Moody's and EJ across NAIC rating categories

investor-paid CRA to cater to demands of investors for inflated ratings, it becomes conceivable that if an incentive to inflate ratings exists, the ensuing hazard of reputation loss might be weaker for EJ. In particular, if investors are not using the ratings of EJ mostly for regulatory purposes rather than informational, we should expect less conservative ratings from EJ. Thus, an empirical implication of catering behavior of EJ is that it is less conservative than Moody's in assigning ratings. Moreover, following the main line of reasoning so far regarding reaching for yield, I will also focus on whether yield spreads have the same effect on the rating outcome of Moody's or not.

Analysis of EJ's behavior relied on the fact that EJ almost never issued a rating at issuance. This allowed us to study the rating behavior of EJ given the effective rating of the security at the time of EJ's decision. However, in order to analyse the difference between EJ and Moody's we need to look at those bonds for which an effective rating already exists. For such bonds, the effective rating already affected the yield and the CRAs will be assigning a new rating given the current status of the issuer, the issue, current effective rating and the yield spread of the bond at the time of assigning a new rating.

Since most of ratings at issuance are produced by Moody's, it is not possible to perform the same regressions for Moody's as an effective rating for a bond that is being rated for the first

time does not exist. Thus, in order to compare the rating behavior of Moody's with respect to the effects of yield on its rating decisions, I focus on rating *updates* provided by Moody's. That is, in contrast with the analysis of bonds *near issuance* in the previous section, I focus on bonds *after issuance*.

	(1)		(2)		(3)		(4)	
rating								
Mdy=1	0.630**	(0.313)	0.800***	(0.251)	-0.306	(0.970)	0.902	(0.585)
spread q=2	-0.270	(0.184)			-0.636**	(0.290)		
spread q=3	-0.297	(0.295)			-0.628*	(0.326)		
spread q=4	-0.715*	(0.372)			-1.191***	(0.451)		
Mdy=1×spread q=2	0.204	(0.228)			1.925***	(0.735)		
Mdy=1×spread q=3	-0.047	(0.256)			1.708*	(1.026)		
Mdy=1×spread q=4	0.477	(0.425)			1.260	(1.229)		
Issue size (log)	0.328**	(0.153)	0.340**	(0.151)	0.275	(0.251)	0.324	(0.251)
Convexity	-0.005	(0.003)	-0.005*	(0.003)	0.006	(0.004)	0.002	(0.004)
Duration	-0.039	(0.035)	-0.049	(0.034)	-0.046	(0.050)	-0.061	(0.051)
Issue maturity (log)	0.451	(0.315)	0.325	(0.298)	0.144	(0.342)	-0.015	(0.337)
Callablity=1	-0.284	(0.348)	-0.203	(0.353)	0.238	(0.652)	0.089	(0.675)
Price volatility	0.045**	(0.022)	0.041**	(0.019)	0.048***	(0.010)	0.044***	(0.011)
Beta	-0.001	(0.005)	-0.001	(0.005)	-0.002	(0.005)	-0.003	(0.005)
Debt to equity	0.003	(0.002)	0.003	(0.002)	0.002**	(0.001)	0.002*	(0.001)
Tangible to total assets	-2.299***	(0.547)	-2.186***	(0.532)	-1.811**	(0.751)	-1.744**	(0.734)
Total assets (log)	-0.929***	(0.148)	-0.889***	(0.148)	0.135	(0.269)	0.196	(0.270)
Return on asset	-0.133***	(0.035)	-0.128***	(0.035)	-0.263***	(0.073)	-0.234***	(0.073)
Return on equity	-0.010**	(0.004)	-0.010**	(0.004)	-0.008	(0.005)	-0.007	(0.005)
Sample	NAIC1-3		NAIC1-3		NAIC3-5		NAIC3-5	
Time dummies	Yes		Yes		Yes		Yes	
Pseudo R sq.	0.202		0.199		0.190		0.173	
Clusters (Issuer)	254.000		254.000		103.000		104.000	
Log Likelihood	-9295.343		-9426.987		-1796.243		-1857.645	
N	12496.000		12620.000		1986.000		2003.000	

Ordered logit regressions of rating categories rated by Moody's and EJ as a function of issue and issuer characteristics. The indicator variable *Mdy* equals to 1 if the rating has been done by Moody's. Signs *, **, *** represent %10, %5 and %1 levels of statistical significance respectively. Standard errors are reported in parentheses and are clustered at the issuer level.

Table 7: Comparison of ratings assigned by Moody's and EJ after issuance

In a direct test for comparison of rating behavior of Moody's and EJ, I pool all the ratings in a regression model where the rating is regressed on all the explanatory variables and a dummy variable that indicates whether that rating is by Moody's. This allows to answer whether Moody's is assigning more strict ratings than EJ while controlling for all explanatory variables.

Table 7 reports the results of several regressions in which the variable *Mdy* indicates whether the rating has been assigned by Moody's. The model is fitted on sub-samples of the data according to the *effective rating* of the bond at the time of the rating event.

The results of the regressions in table 7 indicates that for the bonds with an effective rating of NAIC 1 to 3, that is bonds with a higher quality, Moody's is more pessimistic than EJ. The general pattern that the coefficient of *Mdy* is positive for all sub-samples which means in

comparison with EJ, if the ratings is assigned by Moody's, it is more likely to be lower. This pattern however, is not observed for bonds with an effective rating of NAIC 3 to 5.

Seemingly Unrelated estimates of Moody's vs. EJ rating determinants To formally test the differences of rating behavior between EJ and Moody's, it is useful to simultaneously estimate the two models in order to be able to perform statistical tests on the rating determinants across the two models. Table 8 reports the results of a Seemingly Unrelated Estimation of the rating determinants of EJ and Moody's. Joint estimation of the models allow for statistical inference and testing on coefficients from the tow models. First, simultaneous test of equality of both models indicate that the two models are not equivalent, i.e. the decisions of EJ and Moody's on assigning credit ratings are not the same.

	Moody rating		EJ rating	
spread q=2	0.100	(0.234)	-0.773***	(0.251)
spread q=3	-0.216	(0.289)	-0.592**	(0.294)
spread q=4	-0.290	(0.312)	-1.043***	(0.334)
Issue size (log)	0.472***	(0.117)	0.319**	(0.143)
Duration	-0.137***	(0.037)	-0.074*	(0.044)
Convexity	0.004	(0.042)	-0.108	(0.092)
Callablity=1	-1.260***	(0.344)	0.562	(0.351)
Issue maturity (log)	1.102***	(0.278)	1.419***	(0.300)
Price volatility	0.023***	(0.005)	-0.022***	(0.006)
Beta	-0.003	(0.006)	-0.012**	(0.006)
Debt to equity	0.009***	(0.001)	0.019***	(0.002)
Tangible to total assets	-4.844***	(0.440)	-3.845***	(0.497)
Total assets (log)	-1.171***	(0.120)	-0.920***	(0.114)
Return on asset	-0.174***	(0.026)	-0.208***	(0.035)
Return on equity	-0.018***	(0.005)	-0.047***	(0.006)
Pseudo R sq.	0.308		0.307	
N	757.000		768.000	

This table reports the estimation results of rating determinants of EJ and Moody's. The sample used in estimation consists of all bonds with and effective rating of NAIC1, 2 or 3 at the time of rating event. *Spread q* is a binary variable that indicates the quartile of the spread for all bonds in the same effective rating category during the quarter of rating event. Signs *, **, *** represent %10, %5 and %1 levels of statistical significance respectively. Standard errors are reported in parentheses and are clustered at the issuer level.

Table 8: Seemingly unrelated estimates of rating determinants of EJ vs. Moody's

To formally test whether there exists a difference between the effect of spread on rating outcome of Moody's and EJ, I perform several statistical tests. The Wald test simultaneously tests the equality of all coefficients in the two models with the null hypothesis that each coefficient from the first model is equal to its counterpart from the second model. The value of the Wald statistics is $\chi^2_{23} = 69.61$ with *p-value* of 0.000 which rejects the null hypothesis. This is not

surprising as we expect that two different CRAs with different compensation structures to use different rating technologies with different weights across variables.

More importantly, simultaneous test of *spread quartiles* delivers the Wald statistic of $\chi^2_3 = 8.48$ which has a *p-value* of 0.037. Therefore we can reject the null hypothesis that coefficients of *spread quartile* for Moody's and EJ are the same.

Coefficient	df	χ^2	*p-value*
$\text{spread}_{\text{Moody}}$=$\text{spread}_{\text{EJ}}$	3	8.48	0.0370
$\text{rating}_{\text{Moody}}$=$\text{rating}_{\text{EJ}}$	23	69.61	0.000

Spread tests whether the coefficient of spread quartiles are equal in the two models of EJ and Moody's. *Rating* tests whether all the parameters in the two model are equal.

Table 9: Test of joint equality of parameters between rating determinants of EJ and Moody's

The results of hypotheses tests provided in table 9 indicate that the effects of yield spreads on the rating outcome are statistically different between EJ and Moody's. This result supports the central hypothesis of this paper that EJ assigns better ratings to bonds with higher spread.

5.3 A placebo test of rating inflation

Recall from table 1 that each NAIC rating category consists of several rating letters according to the rating scales of each CRA. For example, the rating category of NAIC2 includes Baa1, Baa2 and Baa3 ratings of Moody's. Therefore, a one notch upgrade from Baa2 to Baa1 does not cause a change of NAIC rating category as both ratings belong to the same NAIC category of ratings. That means such upgrade does not cause any change in the capital requirement of the investors who hold such bond. However, an upgrade from Baa1 to A3, although only one notch as well, has an outcome of a change in NAIC category and if it leads to an effective change in the rating will affect the investor as well.

An important question that arises in the context of this study is that if the goal of catering behavior is to provide better rating for securities that are held by insurance companies, then we must observe that such behavior is strongest at the borders of a change in NAIC category. Empirically, we should expect to see that bonds that are at the top border of each rating category are more likely to be upgraded. This section focuses on testing this empirical implication.

To test how a bond's numerical rating at the top border of a NAIC category predicts the rating outcome, I perform an ordered logit regression in which the *numerical rating* assigned by EJ is regressed over bond and issuer characteristics. In particular, I look at bonds with an effective rating of NAIC2 and NAIC3.

	(1) EJ		(2) EJ	
EJ				
At border=1	-1.240*	(0.697)	3.158*	(1.756)
spread q=2	-0.144	(0.282)	-1.936***	(0.651)
spread q=3	0.548	(0.354)	-2.837**	(1.198)
spread q=4	-0.083	(0.558)	-3.205***	(1.121)
Issue size (log)	0.250	(0.222)	-0.521	(0.511)
Convexity	-0.003	(0.068)	-0.965*	(0.586)
Duration	-0.051	(0.070)	0.364*	(0.213)
Issue maturity (log)	0.595	(0.577)	1.169	(1.228)
Callablity=1	-0.311	(0.702)	4.288***	(1.653)
Price volatility	-0.038**	(0.016)	0.094	(0.070)
Beta	-0.035***	(0.013)	0.023	(0.022)
Debt to equity	0.018**	(0.007)	0.021***	(0.004)
Tangible to total assets	-1.196	(1.691)	-15.547***	(3.253)
Total assets (log)	-0.916**	(0.363)	0.571	(0.504)
Return on asset	0.053	(0.107)	-1.214***	(0.238)
Return on equity	-0.102***	(0.033)	-0.126*	(0.073)
Sample	NAIC2		NAIC3	
Time dummies	Yes		Yes	
Clusters (Issuer)	57.000		27.000	
Pseudo R sq.	0.236		0.513	
N	379.000		173.000	

Ordered logit regressions of numeric rating categories rated by EJ as a function of issue and issuer characteristics. The indicator variable *At border* equals to 1 if the current rating of the issue is just below the border of NAIC2-3 or NAIC1-2 categories. The coefficient of this variable indicates whether there is a systematic difference between ratings of all other issues that are not at the border of NAIC categories. The indicator variable *quartile* indicates the quartile of the spread for all issues with the same effective rating during the quarter. Signs *, **, *** represent %10, %5 and %1 levels of statistical significance respectively. Standard errors are reported in parentheses and are clustered at the issuer level.

Table 10: A placebo test: Estimates of numerical ratings of EJ on firm and issue characteristics

Table 10 reports the results of ordered logit regression of *numerical ratings* of EJ on bond and issuer characteristics near issuance of the bond. The binary variable *At border* indicates whether the bond is at the top border of a NAIC category. The coefficient of this variable indicates whether there is a systematic difference between ratings of all other issues that are not at the border of NAIC categories.

Regression (1) is performed on the sample of bonds with an effective NAIC2 category and indicates that indeed upgrades are partially explained by the bond having a rating that falls just below the border of NAIC1 and spread does not provide much of explanatory power. On the other hand, regression (2) considers bonds that have an effective rating of NAIC3 and shows that a bond that has been rated Ba1 by Moody's at issuance is predicted to obtain a lower rating by EJ keeping all other explanatory variables constant. However, for these bonds the spread still has an effect that is statistically significant and predicts a better rating assignment

by EJ.

6 Conclusion

This paper investigates whether an investor-paid credit rating agency has incentives to produce biased ratings. I argue that an investor-paid CRA might also face a conflict of interest, not with the issuers or the investors but with the regulator, which leads to incentives for biased rating as well. Such incentives arise due to two main reasons: (i) Rating-contingent capital requirements that create a demand for regulatory relief through inflated ratings. Dependence of capital requirement regulations create a possibility of regulatory arbitrage in which investors seek relief from capital requirements. (ii) Propensity of investors to reach for yield which create a demand for inflation of ratings for higher yield securities. Since credit ratings only constrain investors in one dimension of risk, investors take in more risk in other dimensions by reaching for higher yield securities within the credit rating limits. This creates a demand for inflated ratings for such securities.

Using data on credit ratings of corporate bonds market, I find empirical evidence that Egan-Jones Rating Company, an investor-paid CRA, assigns higher ratings to bonds that have a higher yield spread, controlling for a large set of issuer and bond characteristics. Moreover, comparing the rating determinants of EJ vs. Moody's, an issuer-paid CRA, I show that association of better rating outcome with higher yield spreads are specific to EJ and not Moody's.

This result contributes to the debate that regardless of compensation structure of credit rating agencies, mere existence of regulations that relies on credit ratings creates an incentive for inflated ratings. These results also have implications for financial regulations by providing evidence that credit ratings are an imperfect measure for controlling exposure of financial institutions to risk.

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