Non-rating revenue and conflicts of interest

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ABSTRACT. Rating agencies receive most of their revenue from issuers of the securities they rate, leading to a potential conflict of interest. Using a unique data set on payment flows between issuers and rating agencies in India, we test directly whether larger payments are associated with more favorable ratings. We find that an agency which receives non-rating revenue from an issuer rates that issuer's securities 0.3 notches better than other agencies, on average. The higher the revenue, the bigger is this difference. Further, we find that, within rating categories, default rates are higher for firms that have paid for non-rating services. This suggests that the better rating that such firms receive does not reflect lower credit risk.

Keywords: Credit ratings, agency problems, issuer-pays

JEL Codes: G20, G24, G28

I. Introduction

Credit rating agencies that collect, analyze, and publish information on the creditworthiness of borrowers, issuers and individual securities are important intermediaries in credit markets. In the recent financial crisis, large losses on securities that had received overly optimistic ratings at issue contributed to destabilizing the financial system.[1] The key concern with the ratings system has been the conflict of interest generated by the "issuer-pays" business model. Rating agencies are mainly paid by the companies whose securities they rate. These companies benefit from favorable ratings on them or their securities. Therefore, the compensation arrangement leads to a conflict of interest between producers of ratings (the agencies) and users of ratings (such as investors). A number of pieces of indirect evidence support the idea that issuers representing more significant shares of past or future ratings business may receive favorable treatment, because large issuers (He, Qian, and Strahan 2012) who provide more securitization business to rating agencies (Efing and Hau 2014) receive better ratings.[2] However, direct evidence of the link between payment flows and ratings has been absent, likely reflecting the fact that fees and contracts between rating agencies and their clients are not public.

In this paper, we provide a more direct test of the link between payment flows and ratings. To do this, we exploit a recent change in regulation in India, which required Indian rating agencies (including local subsidiaries of the global raters) to disclose details about their compensation arrangements with issuers of debt securities. In the tests, we exploit the fact that many issuers receive ratings from multiple agencies, allowing us to control for issuer-year fixed effects. That is, we can identify the effect of a commercial relationship by comparing the rating assigned by an agency that has a deeper commercial relationship with the issuer to the rating assigned (to the same issuer) by another agency. We focus on two aspects of the commercial ties between issuers and raters: the amount of fees paid, and whether or not the rating agency

[1] See, e.g., Benmelech and Dlugosz (2009), Gordy and Willeman (2012), and Griffin and Tang (2011).

[2] Other indirect evidence of the conflict of interest comes from the impact of competition on ratings (Becker and Milbourn 2011), and the fact that investor-paid ratings are more precise (Cornaggia and Cornaggia 2013).

provides non-rating services, such as risk management consulting, regulatory advice, or monitoring services.

First, we find that rating agencies that receive non-rating revenue from an issuer provide better ratings to that issuer than other agencies. Additionally, we examine the amount paid for consulting. We find that issuers tend to get better ratings the more revenue they generate for an agency. This holds for total revenues (i.e., rating fees plus payment for non-rating services), but the relationship is especially strong for non-rating revenue. The stronger apparent role for non-rating revenues may reflect that this business and the associated payment terms are more fungible, that the amount can more easily adjust in scope over time, and perhaps that the business is more profitable for the raters.

Finally, we study defaults. If higher ratings given by agencies to those issuers that use non-rating services are warranted, default frequencies should be similar for firms within a given rating category, whether or not these firms have a consulting relationship with the rating agency. If such issuers instead get treated more favorably, their ex-post default frequency would be higher than for other issuers with the same rating. We find support for the latter case: within a given rating category, firms that pay for non-rating services have higher one-year default rates than other firms. This is our third finding: default rates are too high for non-rating services to be a sign of (or a cause of) lower credit risk. The fact that issuers with non-rating services have better ratings but *higher* default rates is most consistent with a conflict of interest interpretation.

Our results likely understate the scope of the agency problem we study, because the methodology centers on contemporaneous payment flows. Issuers and rating agencies have long-term relationships, and past or future business, rents or cash flows may be as important as those that are contemporaneous. Given the short time series dimension of our data, this cannot be investigated in great detail. We do find that the association between ratings and fees does hold with a one-year lag.

Our sample concerns Indian firms. For several reasons, our findings may have wider relevance. India is English-speaking, its commercial law is influenced by UK law, and its financial institutions are relatively similar to those found in the OECD (La Porta, Lopez-de-

Silanes, Shleifer, and Vishny 1998). Additionally, the role of ratings in India is similar to their role elsewhere (although public placements of corporate bonds are less important than in the US or Europe), and indeed, the leading Indian rating agencies are majority-owned by S&P, Moody's, and Fitch.[4] Furthermore, Indian accounting and financial data is generally of good quality.[5]

Our results have two main implications. First, the results suggest that rating agencies assign better ratings to issuers that generate more revenues, and that non-rating services are an important vehicle for this. In fact, the global rating agencies currently derive considerable revenue from non-rating services. For example, Moody's reported in 2013 that Moody's Investor Services generated $2.06 billion in ratings-related revenues, while the group's other division, Moody's Analytics, generated $913 million from selling services for "measuring and managing risk".[6] Thus, there is scope for large conflicts of interest stemming from the provision of non-rating services. Second, our results raise the possibility that policy could be designed to better manage the inherent conflict of interest that partially compromises the quality of third party ratings. Mandating issuer disclosure of rating fees and other payments to rating agencies could help mitigate these agency problems (Sangiorgi and Spatt 2011). This approach is used for accounting firm fees, which have to be disclosed in 10-K statements to the SEC. Alternatively, rating agencies could be asked to disclose detailed fees and other revenues for individual issuers.

The rest of the paper is organized as follows. Section II discusses the institutional background. Section III discusses the data sources and describes the variable construction. We present the results in Section IV. Finally, Section V concludes.

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[4] Moody's stake in the Indian agency ICRA (acquired in 2014) post-dates most of our study, however.

[5] Recent studies have used Indian data to examine, for example, the impact of enforcement of creditor rights on the repayment behavior of debtors and the lending decisions by banks (Visaria 2009; von Lilienfeld-Toal, Mookherjee, and Visaria 2012; Vig 2013); to study the effect of cultural proximity between creditors and borrowers on the efficiency of credit allocation (Fisman, Paravisini, and Vig 2012); and to determine how debt contract enforcement costs affect corporate debt and asset maturity (Gopalan, Mukherjee, and Singh forthcoming).

[6] This includes services marketed to fixed income investors, not just issuers. However, it is worth noting that many of these investors are themselves large issuers of fixed income securities.

II. Institutional Background

A. The Corporate Debt Market in India

The Indian corporate debt market has experienced considerable growth in recent years: the 2008-2012 compound annual growth rate in the corporate credit-to-GDP ratio amounted to 18.4% (China: 22.6%, Korea: 8.5%, Singapore: 7.3%; Deutsche Bank Research 2014). The ratio of non-financial corporate debt to GDP was 49.6% in India in 2012 (Deutsche Bank Research 2014), while in the US it amounted to 66.7% in 2012 (BIS and World Bank data). While bank-intermediated credit remains the main source of corporate debt finance in India, the Indian corporate bond market has considerably grown in recent years. From 2004 to 2013, corporate bond issuance increased by 62% to 1.7% of GDP, which is less than in the US, but more than in many OECD countries.[7] As of December 2014, the total volume of outstanding corporate bonds in the Indian bond market amounted to approximately $264bn.[8]

The vast majority of Indian corporate bond issues are privately placed (94% in 2012; SEBI 2013). One reason for the dearth of public corporate bond issues are the stricter regulatory requirements and the associated costs compared to privately placed bonds.[9] The secondary market for corporate debt securities in India is relatively thin. Total corporate debt turnover in the secondary market amounted to Rs7,386bn in 2012-2013; to put these numbers into perspective, total turnover on Indian stock exchanges amounted to Rs32,617bn (SEBI 2013, Tables NY1 and 11).

B. Ratings and Credit Rating Agencies in India

[7] According to the figures for 2013, corporate bond issuance in India is less than in Germany (2.6%), UK (4.5%), and USA (4.6%), but exceeds corporate bond issuance of several OECD economies such as Turkey (1.0%), Austria (1.3%), and Denmark (1.4%); all figures are from IOSCO (2014).

[8] Retrieved from SEBI corporate bond statistics at http://www.sebi.gov.in/cms/sebi_data/statistics/corporate_bonds/outstandingcorpdata.html

[9] In an effort to hasten the development of the primary market for corporate bonds in India, the relevant SEBI Disclosure and Investor Protection Guidelines were amended in 2007. Following these amendments, public debt issues require credit ratings only from one rating agency, not from two as before. Further, public debt issues below investment grade have since then been permitted, and certain structural restrictions previously placed on debt instruments such as those on maturity and option features have been removed.

In India as in other economies, credit ratings are important for private contracting as well as regulation. For example, according to rules specified by the Insurance Regulatory and Development Authority in 2013, insurers in the pension and annuity business can invest at most 60% of assets in corporate bonds, which have to be rated AA or higher.[10] Mutual funds can invest in debt securities up to a BBB rating.

Six agencies are currently recognized and regulated in India: CRISIL Limited, incorporated in 1987; India Ratings & Research (INDRA), incorporated originally as Duff and Phelps Credit Rating India Private Limited in 1996; ICRA Limited, incorporated in 1991; Credit Analysis & Research Ltd. (CARE), incorporated in 1993; Brickwork Ratings India Private Limited, incorporated in 2007; and SME Rating Agency of India Ltd. (SMERA), incorporated in 2005. In terms of revenue, CRISIL is India's largest rating agency, followed by ICRA and CARE.

Two features of Indian rating agencies are worth pointing out. First, several Indian agencies are owned by the large international agencies. As of September 2014, McGraw Hill Financial, the parent company of Standard & Poor's Ratings Services, owns 67% of CRISIL; Moody's Corporation owns 50% of ICRA; and INDRA is a wholly owned subsidiary of Fitch Ratings Inc.

Second, aside from rating debt instruments, Indian rating agencies engage in a variety of business activities that account for a significant part of their revenue. Among others, Indian agencies provide some or all of the following non-rating services: "grading" of mutual funds, real estate projects, IPOs, hospitals, business schools, and local government bodies; risk management services; industry analysis; business and marketing analytics; equity research; business process IT services; management consulting. These non-rating services are often provided through specialized subsidiaries. For example, the ICRA Group of Companies provides rating and grading services through ICRA Limited, while ICRA Management Consulting Services Limited provides consulting services, ICRA Techno Analytics Limited offers software solutions and services, and ICRA Online Limited sells financial information products as well as analytical services support. The fraction of total ICRA Group revenue generated by

[10] At least 40% of assets have to be held in government securities or other approved securities (such as state bonds and state guaranteed loans).

rating services decreased from 63% in fiscal year 2010/11 to 54% in fiscal year 2013/14. In the case of CRISIL, the fraction of total revenue generated by rating services decreased from 40% in fiscal 2010 to 36% in fiscal 2013. These figures show that non-rating revenue accounts for a major and increasing part of these rating agencies' revenues.

C. Regulation of Rating Agencies

The Securities and Exchange Board of India (SEBI) was established in 1992 with the goal of promoting the development of and regulating the Indian securities markets. SEBI issued the first regulations related to rating agencies in 1999: the "SEBI (Credit Rating Agencies) Regulations, 1999" created the regulatory framework for the establishment, operation, and supervision of rating agencies.

Regulation was significantly tightened in May 2010 through the "Circular CIR/MIRSD/CRA/6/2010", which introduced additional transparency and disclosure requirements for rating agencies. These rules relate to the documentation and record keeping of certain aspects of the rating process; publication of detailed default studies to document the performance of assigned credit ratings; formulation of policies and internal guidelines for dealing with conflicts of interests; additional disclosures and duties for rating agencies that issue ratings of structured products, such as the prohibition of provision of consultancy or advisory services regarding the design of structured instruments; rules related to the assignment of unsolicited credit ratings; public disclosure of rating procedures, credit rating histories and default rates. Finally, and most importantly for the purposes of this paper, Section 6.3 in the Circular covers disclosure requirements related to rating agency revenue:

"6.3 Income

6.3.1 A CRA shall disclose the general nature of its compensation arrangements with the issuers.

6.3.2 A CRA shall disclose, in case of accepted ratings, its conflict of interest, if any, including the details of relationship – commercial or otherwise – between the issuer whose securities are being rated / any of its associate of such issuer and the CRA or its subsidiaries.

6.3.3 A CRA shall disclose annually

6.3.3.1 its total receipt from rating services and non-rating services,

6.3.3.2 issuer wise percentage share of non-rating income of the CRA and its subsidiary to the total revenue of the CRA and its subsidiary from that issuer, and

6.3.3.3 names of the rated issuers who along with their associates contribute 10% or more of total revenue of the CRA and its subsidiaries."

The disclosures under point 6.3.3.2 of the Circular permit us to identify the issuers that generate advisory and other non-rating revenue in addition to ratings revenue for the rating agency. While not required, some agencies provide additional voluntary revenue disclosures. For example, CRISIL not only discloses the proportion of non-rating revenue to the total revenue from an issuer (as required by Section 6.3.3.2), but it also annually discloses the proportion of non-rating revenue from an issuer to *CRISIL's total revenue*. Similarly, in 2010 and 2011, ICRA reported the share of total revenue from an issuer to the total revenue of the ICRA Group, provided the issuer obtained non-rating services. ICRA discontinued this voluntary reporting after 2011.

III. Data

Our sample spans the years 2010-2015. First, we obtain data on credit ratings and firms' industry classifications from the CMIE's Prowess database (September 2015 vintage). This source of high-quality corporate data has been used in several recent studies (e.g., Visaria 2009; von Lilienfeld-Toal, Mookherjee, and Visaria 2012; Vig 2013). Credit ratings are available for CRISIL, ICRA, CARE, Brickwork, and INDRA and are reported for each firm at the debt security level.[11] While specific debt instruments do not carry individual identifiers in the database, they are classified into instrument categories such as debentures, long-term loans, and term loans. We focus on non-structured instruments that are assigned medium- or long-term credit ratings by the agencies. Further, we retain only the ten most common instrument categories. The resulting sample consists of ten debt instrument categories (according to the classification in Prowess): cash; cash credit; debentures / bonds / notes/ bills; debt; fixed rate unsecured non-convertible debentures; fund based financial facility/instrument; long term loans; non-fund-

[11] We treat instances where information in the fields *rating date, rating agency, issuer, rating, status,* and *issue amount* is identical as duplicates and in such cases keep only one such entry. Results are similar if we keep all entries. We also drop entries where the rating status is "withdrawn".

based financial facility/instrument; term loans; and working capital loans. We verified that results are not sensitive to these sample selection procedures: results are similar if we include all non-structured instrument types with medium or long-term ratings in the sample.

Ratings are based on the following alphanumeric scale: AAA (highest creditworthiness), AA, A, BBB, BB, B, C, D (default); for the symbols "AA" to "C" the modifiers "+" and "-" are used to indicate the relative strength within the rating categories concerned.[12] The variable *Issuer Rating* exhibits variation at the issuer-rater-year level and is defined as follows. We first assign numerical values to the alphanumeric debt instrument ratings, with a value of one denoting the highest credit rating "AAA" and the value 19 denoting "C-". For each issuer, rating agency, and year, we average over the instruments' ratings to obtain an issuer-level credit rating; we verified that taking the median or the maximum does not significantly change our results. To reduce the possible impact of outliers, we exclude nine firm-years from the sample in which the difference between the *Issuer Rating* from one agency and the average *Issuer Rating* assigned by the other rating agencies in that year is ten notches or higher in absolute terms.[13]

In Section IV.C, we study defaults. The variable *Default in t+1* is defined at the firm-year level and takes the value of one in year *t* if a given company has a debt instrument on which the company defaults in year *t+1* (irrespective of which agency rates that instrument); the variable takes a value of zero otherwise.

We obtain information on rating agencies' non-rating clients as well as issuer-specific revenue from the "Regulatory Disclosures" sections of the agencies' websites.[14] The rating

[12] While all agencies' alphanumeric ratings can be unambiguously mapped into this scale, the specific rating symbols may differ between rating agencies and over time. For example, until 2011, ICRA denoted long term ratings with the symbols "LAAA", "LAA+", "LAA" etc., while CRISIL used "AAA", "AA+", "AA" etc. Furthermore, following the 2011 SEBI Circular "Standardization of Rating Symbols and Definitions," rating agencies unified the ratings symbols. For example, CRISIL changed the long term rating symbols from "AAA", "AA+" etc. to "CRISIL AAA", "CRISIL AA+" etc. However, all these ratings are based on a 20 notch rating scale.

[13] Including these observations in the sample does not, however, alter our results in any significant way.

[14] The relevant information is drawn from the disclosures related to SEBI's circular CIR/MIRSD/CRA/6/2010. Of most interest to us are income disclosures referring to point 6.3.3 of the circular. See section II.C for more details.

agencies only make current disclosures available on their websites. We obtain historical disclosures by contacting the rating agencies or use past records of the relevant sections of the agencies' websites as maintained on The Internet Archive.[15] Based on these compulsory disclosures, we find that ICRA, CRISIL, and CARE provided compensated non-rating services to Indian issuers, while Brickwork and INDRA did not. Furthermore, two of the rating agencies also voluntarily disclosed the ratio of (non-rating) revenue per issuer to total agency revenue: CRISIL reported this information for each of its fiscal years 2010-2014, while ICRA did so for fiscal years 2010 and 2011.

Non-rating Services is a dummy variable that takes the value of one if an issuer pays for non-rating services from a rating agency in a given year, zero otherwise. The relevant information is available for the following agencies and sample years: years 2010 to 2014 for CRISIL; years 2010-2015 for ICRA, Brickwork, and INDRA; years 2013-2015 for CARE.[16] The variable *Non-rating Issuer Revenue* denotes annual non-rating revenue from an issuer divided by the total revenue of the rating agency (in percent), while the variable *Total Issuer Revenue* is the total annual revenue from an issuer divided by total agency revenue (in percent).[17] The latter two variables are

[15] CRISIL compliance made available all past disclosures to us. All past disclosures from ICRA could be obtained from The Internet Archive. For CARE we can retrieve the relevant disclosures for the fiscal years 2012/2013, 2013/2014, and 2014/2015; we cannot ascertain whether CARE provided non-rating services in prior years. Finally, to our knowledge, Brickwork and INDRA have not been providing non-rating services during our sample period.

[16] CRISIL's fiscal year ends in December, so revenue information for the reporting period e.g. January 2010 to December 2010 is coded as year 2010 in our sample. The other agencies' fiscal years end in March, so revenue information for the reporting period e.g. April 2010 to March 2011 is coded as 2011 in our sample.

[17] CRISIL discloses for the years 2010-2014 the "Contribution of Non Rating Income" (non-rating revenue from an issuer to total group revenue) and the "Proportion of Non Rating Income" (non-rating revenue to total revenue from an issuer). The variable *Non-rating Issuer Revenue* is then Contribution x 100, while the variable *Total Issuer Revenue* is (1/Proportion) x Contribution x 100. Note that Contribution is reported with a precision of four decimal places; therefore, in these instances, the variables *Non-rating Issuer Revenue* and *Total Issuer Revenue* take the value of zero. These observations are distinguished in our tests from cases where we have no revenue observations through the dummy variable *No Revenue Info*; this variable takes the value of zero in the former case but a value of one in the latter case. ICRA discloses in 2010 and 2011 the "Share of Non Rating Income to Total Income from Issuer" (SNRITII) and the "Share of Total Income from Issuer to Total Income of Group ICRA" (STIITIGI). Our variable *Total Issuer Revenue* is then STIITIGI x 100, and the variable *Non-rating Issuer Revenue* is STIITIGI x SNRITII x 100. These variables are based on the voluntary revenue disclosures by CRISIL and ICRA.

available for CRISIL-rated firms with non-rating business for the years 2010-2014, and for ICRA-rated firms that obtain non-rating services for the years 2010 and 2011. Finally, the variable *No Revenue Info* is a dummy variable which is set equal to one if *Non-rating Issuer Revenue* is not reported by the rating agency; missing values of *Non-rating Issuer Revenue* and *Total Issuer Revenue* are set to zero.

We use the product-market based industry classification system developed by CMIE to assign firms to industries; there are 145 industries in our sample. We match the revenue information from the regulatory disclosure files to the ratings from Prowess using firm names.

IV. Results

A. Summary statistics

We report summary statistics in Table 1. Each observation in our sample is a firm-agency-year. Panel A shows a frequency distribution of observations with non-rating services. Our sample spans the years 2010-2015 and covers 26,760 firm-agency-years. There are 7,083 firms in our sample, of which 473 obtain non-rating services at some point during the sample period, corresponding to 1,165 observations (4.4% of the total) in our sample. The rest of the panel reports a breakdown by rating agency; for example, 7.9% of the sample observations with a CRISIL rating are associated with payments for non-rating services provided by CRISIL. In Panel B, we report the mean, standard deviation, minimum and maximum of the variables *Issuer Rating*, *Non-rating Services*, *Non-rating Issuer Revenue*, *Total Issuer Revenue*, and *No Revenue Info*. The average *Issuer Rating* in the sample is 9.04, which approximately corresponds to a BBB letter rating. Panel C shows that for the average issuer that pays for non-rating services, *Total Issuer Revenue* amounts to 0.05% (the sample maximum is 0.90%) while *Non-rating Issuer Revenue* is 0.02% (the sample maximum is 0.51%).

Panels D—F of Table 1 report summary statistics for the sample used for the analysis of defaults in section IV.B. The sample is smaller because it ends in 2014 (using default information until September 2015, however), and because we require firms in this sample to have at least two consecutive years of data. Panel D classifies observations by coarse rating category and default status. Panel E reports summary statistics for the variables used in our tests on defaults.

According to Panel E, the average one-year default rate across all rating categories during the sample period is 3.8%. Panel F reports separate summary statistics for investment grade and high yield firms, respectively. In the investment grade sub-sample, the average one-year default rate is 1.3%, while it is 8.3% for high yield firms. In comparison, for high yield firms, Standard & Poor's (2015) reports a global corporate default rate of 2.2% per annum (2010-2014 average).

B. Payment flows and credit ratings

Do issuers that pay a rating agency for non-rating services obtain better ratings from that rater? Figure 1 provides a first look at the relevant data. It plots the distribution of ratings for issuers that obtain non-rating services and those that don't, after accounting for industry effects.[18] The figure shows that issuers that generate non-rating revenue for the rating agency indeed obtain a rating that is on average about three notches better.

The difference in ratings of firms that hire a rater for non-rating services and those that don't as documented in Figure 1 is likely to be driven by a number of different factors, some of which may be unobservable.[19] As a consequence, the simple correlation between *Issuer Rating* and *Non-rating Services* could be spurious. Therefore, the tests that follow rely on *within-firm* variation of the demand for non-rating services. This helps rule out a number of alternative explanations involving which firms tend to use credit rating agencies for non-rating services. Specifically, we estimate parameters from the following regression model:

$$(Issuer\ Rating)_{i,j,t} = \alpha \cdot X_{i,j,t} + \beta_j + \gamma_i + \delta_t + \varepsilon_{i,j,t}$$

where i denotes the issuer, j the rating agency, and t the year. β, γ, and δ denote fixed effects, and $X_{i,j,t}$ is a revenue measure. In all regressions, we report standard errors that are adjusted for within-firm clustering of the error terms $\varepsilon_{i,j,t}$.

[18] Specifically, we plot the residuals from the following regression: $(\text{Issuer Rating})_{i,j,t} = \gamma_{i \to k} + \varepsilon_{i,j,t}$ where i denotes the firm, k the industry, j denotes a rating agency, t denotes the year, and $\gamma_{i \to k}$ are industry dummies.

[19] For example, larger firms are likely to have better ratings; they are also likely to have more complex capital structures and, therefore, may have more demand for non-rating services such as risk-management advice.

Exploiting within-firm variation helps address many identification challenges, but the concern remains that there may be time-varying firm-level omitted variables related to both credit quality and the propensity to use consulting services. Therefore, our main specification employs *within-firm-year* variation for identification. That is, we identify the effect of (for example) the payment for non-rating services on ratings through differences in the provision of such services *across* agencies *within* a given firm-year. In these specifications, instead of separate issuer (γ_i) and year (δ_t) fixed effects, we employ *issuer x year* fixed effects ($\gamma_{i\times t}$). This permits us to rule out that any firm-level omitted variables—even if time-varying—explain our results. We only need to assume that selection into the use of non-rating services does not affect ratings asymmetrically across rating agencies.

Identifying within issuer-year is only possible for firms that have more than one rating and that use non-rating services from some but not all agencies which rate them. These firms may differ from the overall population of firms (i.e., those obtaining no non-rating services or acquiring such services from all raters), for example in terms of how much they care about credit ratings, or how opaque they are to financial markets. This may affect the external validity of our results. For example, it is conceivable that the quality of ratings is most impacted by payment flows to agencies for the set of firms that hire many agencies as consultants, but we cannot identify this using the fixed effect methodology.

Table 2 reports results from tests with the dummy variable *Non-rating Services* as the explanatory variable. Specification 1 includes issuer, year, and agency dummies, while specification 2 employs *issuer x year* fixed effects in addition to agency fixed effects. We find that the coefficients in both specifications are significant at the 1% level and that they are of similar magnitude. According to these estimates, firms that pay a rating agency for non-rating services obtain a rating from that agency that is about 0.3 notches lower (better) than the average rating obtained from the other agencies in that year.

Next, we shed more light on the association between the amount paid to a rating agency and the rating issued, for those firms that use non-rating services. Does paying more lead to a

better rating? The conflict of interest hypothesis suggests that issuers that generate more financial value for a rating agency obtain better ratings.

We first explore this question graphically. For this purpose, it is useful to define the variable *Rating Difference*, which for a firm with multiple ratings in a given year, is the difference between the *Issuer Rating* from one rating agency minus the cross-sectional average of the ratings obtained from the other agencies. Figure 2 plots the *Rating Difference* against the *Non-rating Issuer Revenue* and fits a local polynomial smooth line. The figure shows that the more an issuer contributes to the total revenue of a rater, the better is the rating that the issuer receives from that agency, on average.[20]

In Table 3, we shed more light on the relationship between payment flows and ratings. We employ similar regressions as those reported in Table 2, but now *Non-rating Issuer Revenue* and *Total Issuer Revenue* are the explanatory variables of interest. Furthermore, we add the dummy variable *No Revenue Info* to our set of regressors, which permits identification using the full sample of firm-agency-years as in Table 2. The specifications reported in columns 1 and 2 employ *Non-rating Issuer Revenue* as the explanatory variable of interest, while columns 3 and 4 use *Total Issuer Revenue*, and finally, columns 5 and 6 use both. The regressions represented by columns 1, 3, and 5 employ issuer, agency, and year fixed effects, while those of columns 2, 4, and 6 employ *issuer x year* and agency fixed effects.

In columns 1 and 2 we find negative coefficients on the variable *Non-rating Issuer Revenue.* The coefficients are significant at the 1% level. In terms of magnitude, according to the specification in column 2, a one standard deviation increase in non-rating fees is associated with a 0.24 notch ratings improvement. Compared to the average effect of using non-rating services, estimated to be 0.3 notches, this is large, suggesting that the amount paid is important. Columns 3 and 4 report results with *Total Issuer Revenue* as the explanatory variable. In these specifications, the coefficient of interest is negative but less precisely estimated (significant at the 10% and 5% level, respectively). Finally, in columns 5 and 6 we include both revenue measures

[20] The maximum *Non-rating Issuer Revenue* of firms with multiple ratings is 0.48%. This observation appears as an outlier in Figure 2. We ascertain that all our results are robust to the exclusion of this observation from our tests.

in the regressions (the correlation between the two measures in the full sample is 0.75). In these specifications, the coefficient on *Total Issuer Revenue* is no longer significant, while the coefficient on *Non-rating Issuer Revenue* is significant at the 1% level, with economic magnitudes similar to those reported in columns 1 and 2.

Overall, we interpret these results as consistent with a fee-driven conflict of interest between rating agencies and security issuers: when an issuer is directly important to an agency through the fees it generates—in particular, fees for non-rating services—then ratings seem slightly upward biased. The difference in significance between total revenue and non-rating revenue may reflect several factors. First, it may be that rating fees are fixed, and that there is more leeway in pricing of non-rating services. That would imply that using non-rating services is the most direct way of transferring rents to a rating agency, and thus the key variable for predicting biased ratings. Consistent with this interpretation, the dummy for using non-rating services is associated with higher ratings (see above). Alternatively, total revenue is a noisier measure of the rents an issuer provides to a rating agency. It is conceivable that ratings are simply less profitable than consulting. Because these interpretations are not contradictory, the fact that they are observationally equivalent may not be consequential.

We focus on the contemporaneous relationship between ratings and payment flows in Table 3. However, if the relationship between issuer and agency is long-term, past payments may affect current ratings. The time-series dimension of our data is somewhat limited, but we explore this relationship between ratings and current and past payments in Table 4.[21] Column 1 reports a specification with firm, year, and agency fixed effects, while the regression underlying column 2 employs *issuer x year* as well as agency fixed effects. The results suggest that while contemporaneous payments matter, it is primarily past payments that determine current ratings.

C. Non-Rating Revenue, Ratings, and Defaults

[21] While we have five years of revenue data for CRISIL, only two years of such data exist for ICRA. CARE does not report information on fee payments. Further, we observe a rating only in years in which new instruments are issued, or ratings are changed or re-affirmed.

In the previous section, we found that an agency that receives non-rating revenue from a firm issues a better rating to that firm than other agencies. It is conceivable that these better ratings are warranted. To see if this is the case, we examine ex-post default rates.[22] If better ratings given by agencies to issuers that use non-rating services are warranted, default frequencies should be similar for firms within a given rating category, whether or not these firms have a consulting relationship with the rating agency. If such issuers instead get treated more favorably, their ex-post default frequency would be higher than for other issuers.

To examine this point, we use one-year default rates (variable *Default in t+1*; see Section III). Figure 3 shows one-year default rates by rating category. While there were no defaults in the categories AAA and AA during our sample period, the average one-year default rate across all rating categories was 3.8%. Table 1, Panel D, sheds more light on the defaults in the sample. The table reports that, for example, 23 of the 3,072 firms with an "A" rating in year *t* default in year *t+1,* while 248 of the 1,843 "B" rated firms do.

In Figure 4, we graphically examine the relationship between ratings, the payment for non-rating services, and defaults. As in the previous figure, we plot the one-year default rate on the vertical axis against broad rating categories on the horizontal axis; within each rating category, we now also separately report average one-year default rates for issuers that obtain non-rating services and for issuers that do not pay for such services. The figure shows that within each rating category, default rates are higher for firms that pay for non-rating services.

To formally test whether within-rating category differences in default rates between firms that pay for non-rating services and those that don't are jointly significant, we regress the variable *Default in t+1* on the variable *Non-rating Services*. We report the results in Table 5. Columns 1-4 control for the rating linearly by including the variable *Issuer Rating* as a regressor, while columns 5-8 include fixed effects for each of the 19 possible rating notches.[23] In addition to

[22] We note that in a previous version of this paper (which is available from the authors upon request), we used default probabilities from the NUS-RMI Credit Research Initiative instead of actual defaults to address this question. We obtained similar results.

[23] As explained in Section III, the variable *Issuer Rating* is the average rating a firm receives for all instruments rated by a given agency in a given year; the variable is thus continuous. To be able to include rating fixed effects in columns 5-8 of Table 5, we round the variable *Issuer Rating* to whole numbers.

these controls for the rating, columns 2 and 6 additionally include agency fixed effects; columns 3 and 7 additionally include agency, year, and industry fixed effects; and, finally, columns 4 and 8 additionally include agency and *industry x year* fixed effects. As the dependent variable exhibits variation at the issuer-year level only (as opposed to issuer-agency-year level as in the previous tests), we cannot include *issuer x year* fixed effects in the default tests.

Table 5 shows that the coefficient on the variable *Non-rating Services* is positive and significant at the 1% level in all but one case; in column 5, the relevant coefficient is significant at the 10% level. Overall, the results suggest that on average, controlling for the rating, firms that pay for non-rating services have higher default rates. Based on the estimates with rating fixed effects (columns 5-8), we find that such firms have a one percentage point higher default rate. As the average default rate in the sample is 3.8%, this corresponds to a difference of about 26% between firms that pay for non-rating services and those that don't.

As is evident from Figure 3, the relationship between ratings and defaults is convex. Therefore, the association between the variables *Non-rating Services* and *Default in t+1* may be different in the sub-sample of investment and non-investment grade (i.e., high yield) firms, respectively. To shed some light on this, we split the sample along the investment grade threshold. Results are reported in Table 6. Panel A shows results for the investment grade sub-sample (a rating better than BBB-), while Panel B reports results for the high yield sub-sample (BB+ or worse rating). In Panel A, column 8, the coefficient on *Non-rating Services* is around 0.007, which suggests that the default rate of investment-grade firms that pay for non-rating services is about 0.7 percentage points higher than that of firms that don't. Given the relevant sample mean of 1.3% (see Table 1, Panel E), this implies a difference of about 54%. In the high yield sub-sample (Panel B of Table 6), the relevant coefficient is around 0.11, implying that high yield firms that pay for non-rating services have an 11 percentage point higher default rate. The average default rate in this sub-sample is 8.3%, suggesting a difference in the default likelihood of more than 100%. As a caveat, we note that the coefficients on the variable *Non-rating Services* reported in Panel B of Table 6 are significant only at the 10% level in most instances. Taken at face value, the results suggest that the importance of payments for non-rating services appears

about twice as large in the high yield range. Perhaps such issuers are more willing to pay for better ratings.

In sum, the empirical analysis of ratings, default rates, and payments for non-rating services suggests that the better ratings assigned to issuers that pay rating agencies for non-rating services are not warranted: within a given rating category, firms that obtain non-rating services have higher one-year default rates than other firms. Furthermore, the association between the payment for non-rating services and defaults is quantitatively larger for high yield firms than for investment grade firms; however, the estimates in the non-investment grade sub-sample are less precise.

D. Discussion

The results on defaults discussed in the previous section alleviate a number of possible concerns related to our finding from section IV.B that firms that pay for non-rating services obtain better ratings. For example, one could argue that the provision of non-rating services enables a rater to obtain additional information about an issuer that is useful in assessing credit risk. This in itself cannot explain our results on ratings, as such information should not be positive—that is, implying lower credit risk—on average. However, it is conceivable that firms that have hidden qualities that imply low default risk obtain non-rating services in part to enable the rater to uncover such qualities. In this case, such firms should have lower default rates, which is the opposite of what we find.

Another possibility is that obtaining additional non-rating services (such as risk-management advice) reduces credit risk, but the improvement is discernible only by the rating agency providing such services, not by other raters, at least initially. This argument is also inconsistent with our findings on defaults, as such firms should have lower default risk.

Finally, the results on defaults also address a reverse causality concern: a relatively lenient rating (compared to the rating given by other agencies) could determine the subsequent demand for non-rating services by an issuer from the agency issuing that lenient rating. Our default results imply that firms would tend to obtain consulting advice and other non-rating services

precisely from those rating agencies that tend to underestimate their default risk. While we cannot rule out this explanation, it does not appear to be plausible.

V. Conclusion

Issuer-paid credit ratings play an important role in Indian fixed income markets, as elsewhere. These ratings give investors access to a public signal that can be used for contracting and screening securities, without incurring fees. However, issuer-paid ratings involve a fundamental conflict of interest, since the paying party has an interest in upward biased ratings. There is mounting indirect evidence on where and how this conflict is important.[24] However, there is no evidence to date on whether actual payment flows relate to optimistic ratings. Do favored issuers generate more business? Pay higher fees per rating? Commit to their raters with longer contracts?

In this paper, we use a unique data set based on agencies' reports of revenue from individual issuers to assess whether revenues are related to the level of ratings. We study two forms of revenue, compensation for ratings and compensation for other services, and find that especially the latter is strongly associated with better ratings. The magnitude is modest: paying for non-rating services is associated with a 0.3 notch ratings improvement, and big payers only see a slightly more substantial ratings improvement. This is consistent with two points of the literature: corporate credit ratings perform well and are less subject to bias than structured ratings (Cornaggia, Cornaggia, and Hund 2015 make an explicit comparison; see also Benmelech and Dlugosz 2009), but corporate ratings are not immune to bias (e.g., Becker and Milbourn 2011; Alp 2013; Baghai, Servaes, and Tamayo 2014; Dimitrov, Palia, and Tang 2015). Our results add an additional piece of evidence: the fundamental agency problem in ratings can operate through higher past and contemporaneous payment flows from issuers to raters, and especially through non-ratings fees.

[24] E.g., when competition is high (Becker and Milbourn 2011), when individual issuers represent large shares of total business (He, Qian, and Strahan 2012, and Efing and Hau 2014), and when the economy is strong (Bolton, Freixas, and Shapiro 2012).

Do our results point to any policies for maintaining the integrity of credit ratings? Reducing the opportunities for rating agencies to perform non-rating services for their clients seems like one possibility, since these revenues are especially associated with bias. Such activities could even be prohibited entirely. This may certainly have negative side effects, which we have not considered. As an alternative, increased disclosure may facilitate scrutiny by investors and outsiders of the role non-ratings fees play. If data of the type we use was routinely available for the large fixed income markets, there would be scope for outsiders to assess the risk of bias in individual ratings. For corporate issuers, who typically issue annual reports and other public accounting statements, disclosure of the type mandated for their relationships with accountants might prove a template.

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Table 1. Summary statistics

Panel A reports a frequency distribution of firm-agency-years with non-rating services, as well as a breakdown by rating agency. The sample spans the years 2010-2015. **Panel B** reports the mean, standard deviation, minimum and maximum of the variables used in the study of ratings. *Issuer Rating* is defined as follows. We first assign numerical values to the alphanumeric instrument ratings, with a value of one denoting the highest credit rating "AAA" and the value 19 denoting "C-". For each issuer, rating agency, and year, we average over the instruments' ratings to obtain an issuer-level credit rating. *Non-rating Services* is a dummy variable that takes the value of one if an issuer pays for non-rating services from a given rating agency in a given year, zero otherwise. The relevant information is available for the following agencies and sample years: years 2010 to 2014 for CRISIL; years 2010-2015 for ICRA, Brickwork Ratings, and INDRA; years 2013-2015 for CARE. *Non-rating Issuer Revenue* is non-rating revenue from an issuer divided by the total revenue of the rating agency (in percent). *Total Issuer Revenue* is total revenue from an issuer divided by total agency revenue (in percent). The latter two variables are available for CRISIL-rated firms with non-rating business for the years 2010-2014, and for ICRA-rated firms that obtain non-rating services for the years 2010 and 2011. *No Revenue Info* is a dummy variable which is set equal to one if non-rating revenue is not reported by the agency; missing values of *Non-rating Issuer Revenue* and *Total Issuer Revenue* are set to zero. **Panel C** reports summary statistics for the variables *Non-rating Issuer Revenue* and *Total Issuer Revenue* conditional on this information being available (that is, instances where the dummy variable *No Revenue Info* takes a value of zero). **Panels D** to **F** show summary statistics for the variables used in the analysis of default rates in Section IV.C. The sample spans the years 2010-2014. **Panel D** reports the number of defaults by rating category. **Panel E** reports the mean, standard deviation, minimum and maximum of the variables used in the study of defaults. *Default in t+1* is defined at the firm-year level and takes the value of one in year *t* if a given company has a debt instrument on which the company defaults in year *t+1* (irrespective of which agency rates that instrument); the variable takes a value of zero otherwise. **Panel F** reports summary statistics for the default sample, split along the investment grade threshold.

Panel A

Full sample		
	Frequency	Percent
Non-rating Services = 0	25,595	95.65
Non-rating Services = 1	1,165	4.35
Total	*26,760*	*100*
CRISIL only		
	Frequency	Percent
Non-rating Services = 0	9,299	92.13
Non-rating Services = 1	794	7.87
Total	*10,093*	*100*
ICRA only		
	Frequency	Percent
Non-rating Services = 0	7,962	96.26
Non-rating Services = 1	309	3.74
Total	*8,271*	*100*
CARE only		
	Frequency	Percent
Non-rating Services = 0	5,071	98.79
Non-rating Services = 1	62	1.21
Total	*5,133*	*100*
Brickwork Ratings only		
	Frequency	Percent
Non-rating Services = 0	852	100
INDRA only		
	Frequency	Percent
Non-rating Services = 0	2,411	100

Panel B

	Obs.	Mean	Std. Dev.	Min	Max
Issuer Rating	26,760	9.0436	3.8381	1.0000	19.0000
Non-rating Services	26,760	0.0435	0.2041	0.0000	1.0000
Non-rating Issuer Revenue (%)	26,760	0.0007	0.0082	0.0000	0.5100
Total Issuer Revenue (%)	26,760	0.0017	0.0188	0.0000	0.8970
No Revenue Info	26,760	0.9674	0.1777	0.0000	1.0000

Panel C

	Obs.	Mean	Std. Dev.	Min	Max
Non-rating Issuer Revenue (%)	873	0.0200	0.0409	0.0000	0.5100
Total Issuer Revenue (%)	873	0.0510	0.0913	0.0000	0.8970

Panel D

	AAA	AA	A	BBB	BB	B	C	Total
Default in t+1 = 0	880	2,209	3,049	5,790	4,342	1,595	136	18,001
Default in t+1 = 1	0	0	23	135	249	248	51	706
Total	*880*	*2,209*	*3,072*	*5,925*	*4,591*	*1,843*	*187*	*18,707*

Panel E

	Obs.	Mean	Std. Dev.	Min	Max
Default in t+1	18,707	0.0377	0.1906	0.0000	1.0000
Issuer Rating	18,707	8.8233	3.8880	1.0000	18.0000
Non-rating Services	18,707	0.0532	0.2245	0.0000	1.0000

Panel F

Investment grade sub-sample

	Obs.	Mean	Std. Dev.	Min	Max
Default in t+1	12,086	0.0131	0.1136	0.0000	1.0000
Issuer Rating	12,086	6.6539	2.9124	1.0000	10.0000
Non-rating Services	12,086	0.0786	0.2691	0.0000	1.0000

High yield sub-sample

	Obs.	Mean	Std. Dev.	Min	Max
Default in t+1	6,621	0.0828	0.2756	0.0000	1.0000
Issuer Rating	6,621	12.7833	1.7186	10.1000	18.0000
Non-rating Services	6,621	0.0069	0.0831	0.0000	1.0000

Table 2. Ratings and the provision of non-rating services

This table reports the coefficients for regression models estimating the association between ratings and the provision of non-rating services. Each observation corresponds to an issuer-agency-year. The variables are defined in Table 1. Heteroskedasticity-robust standard errors, clustered by issuer, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

	(1)	(2)
	Issuer Rating	
Non-rating Services	-0.2806***	-0.3263***
	(0.058)	(0.068)
Agency F.E.	x	x
Year F.E.	x	
Issuer F.E.	x	
Issuer x Year F.E.		x
Observations	26,760	26,760
Adjusted R-squared	0.937	0.994

Table 3. Ratings and payment for non-rating services

This table reports the coefficients for regression models estimating the association between ratings and revenue from issuers. Each observation corresponds to an issuer-agency-year. The variables are defined in Table 1. Heteroskedasticity-robust standard errors, clustered by issuer, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)
			Issuer Rating			
Non-rating Issuer Revenue	-3.3929***	-5.7704***			-3.9131***	-4.9708***
	(1.206)	(1.309)			(1.506)	(1.861)
Total Issuer Revenue			-0.7729*	-2.0491**	0.3587	-0.5595
			(0.416)	(0.876)	(0.456)	(0.998)
No Revenue Info	0.2539***	0.2470***	0.2820***	0.2650***	0.2637***	0.2276***
	(0.063)	(0.076)	(0.064)	(0.085)	(0.065)	(0.077)
Agency F.E.	x	x	x	x	x	x
Year F.E.	x		x		x	
Issuer F.E.	x		x		x	
Issuer x Year F.E.		x		x		x
Observations	26,760	26,760	26,760	26,760	26,760	26,760
Adjusted R-squared	0.937	0.994	0.937	0.994	0.937	0.994

Table 4. Ratings and past payments for non-rating services

This table reports the coefficients for regression models estimating the association between ratings and revenue from issuers. Each observation corresponds to an issuer-agency-year. *Lag(·)* is the lag operator and denotes one-year lags of the relevant variable. The variables are defined in Table 1. Heteroskedasticity-robust standard errors, clustered by issuer, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

	(1)	(2)
	Issuer Rating	
Non-rating Issuer Revenue	-1.8891*	-1.5133
	(1.081)	(1.055)
Lag(Non-rating Issuer Revenue)	-2.3432***	-2.3047***
	(0.838)	(0.791)
No Revenue Info	0.2785***	0.2594**
	(0.076)	(0.114)
Lag(No Revenue Info)	0.0463	0.0038
	(0.071)	(0.118)
Agency F.E.	x	x
Year F.E.	x	
Issuer F.E.	x	
Issuer x Year F.E.		x
Observations	17,165	17,165
Adjusted R-squared	0.951	0.997

Table 5. Ratings, defaults, and payments for non-rating services

This table reports the coefficients for regression models estimating the association between default rates and the provision of non-rating services. Each observation corresponds to an issuer-agency-year. The variables are defined in Table 1. In specifications where we include issuer rating fixed effects (columns 5—8), we round the variable *Issuer Rating* to whole numbers and include one dummy variable per rating notch. Heteroskedasticity-robust standard errors, clustered by issuer, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Default in t+1			
Non-rating Services	0.0269***	0.0340***	0.0273***	0.0281***	0.0084*	0.0151***	0.0139***	0.0151***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)
Issuer Rating	0.0101***	0.0103***	0.0115***	0.0115***				
	(0.000)	(0.000)	(0.001)	(0.001)				
Constant	-0.0528***							
	(0.003)							
Issuer Rating F.E.					x	x	x	x
Agency F.E.		x	x	x		x	x	x
Year F.E.			x				x	
Industry F.E.			x				x	
Industry x Year F.E.				x				x
Observations	18,707	18,707	18,707	18,707	18,707	18,707	18,707	18,707
Adjusted R-squared	0.039	0.042	0.054	0.056	0.060	0.062	0.073	0.076

Table 6. Ratings, defaults, and payments for non-rating services: investment-grade versus high yield firms

This table reports the coefficients for regression models of credit ratings. Each observation corresponds to an issuer-agency-year. The variables are defined in Table 1. **Panel A** shows results for the sample of investment-grade firms, while **Panel B** reports results for the speculative –grade sample. In specifications where we include issuer rating fixed effects (columns 5—8), we round the variable *Issuer Rating* to whole numbers and include one dummy variable per rating notch. Heteroskedasticity-robust standard errors, clustered by issuer, are reported below coefficients. * denotes estimates that are significantly different from zero at the 10% level, ** at the 5% level, and *** at the 1% level.

Panel A: Investment grade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Default in t+1				
Non-rating Services	0.0032	0.0075***	0.0076**	0.0084**	0.0018	0.0060**	0.0065**	0.0072**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Issuer Rating	0.0035***	0.0036***	0.0034***	0.0034***				
	(0.000)	(0.000)	(0.000)	(0.000)				
Constant	-0.0103***							
	(0.002)							
Issuer Rating F.E.					x	x	x	x
Agency F.E.		x	x	x		x	x	x
Year F.E.			x				x	
Industry F.E.			x				x	
Industry x Year F.E.				x				x
Observations	12,086	12,086	12,086	12,086	12,086	12,086	12,086	12,086
Adjusted R-squared	0.007	0.009	0.014	0.014	0.008	0.009	0.015	0.014

Panel B: High yield

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Default in t+1				
Non-rating Services	0.1260**	0.1271**	0.1086*	0.1217*	0.1203*	0.1215*	0.1034*	0.1148*
	(0.061)	(0.062)	(0.061)	(0.062)	(0.062)	(0.062)	(0.062)	(0.063)
Issuer Rating	0.0284***	0.0295***	0.0292***	0.0291***				
	(0.003)	(0.003)	(0.003)	(0.003)				
Constant	-0.2806***							
	(0.032)							
Issuer Rating F.E.					x	x	x	x
Agency F.E.		x	x	x		x	x	x
Year F.E.			x				x	
Industry F.E.			x				x	
Industry x Year F.E.				x				x
Observations	6,621	6,621	6,621	6,621	6,621	6,621	6,621	6,621
Adjusted R-squared	0.032	0.037	0.069	0.086	0.038	0.042	0.073	0.090

Figure 1. Ratings of firms with and without non-rating services

This figure shows the distribution of issuer ratings for firms that obtain non-rating services and those that don't, after accounting for differences due to industry effects. Specifically, we plot the residuals from the following regression: $(\text{Issuer Rating})_{i,j,t} = \gamma_{i \to k} + \varepsilon_{i,j,t}$ where *i* denotes the firm, *k* the industry, *j* denotes a rating agency, *t* denotes the year, and $\gamma_{i \to k}$ are industry dummies.

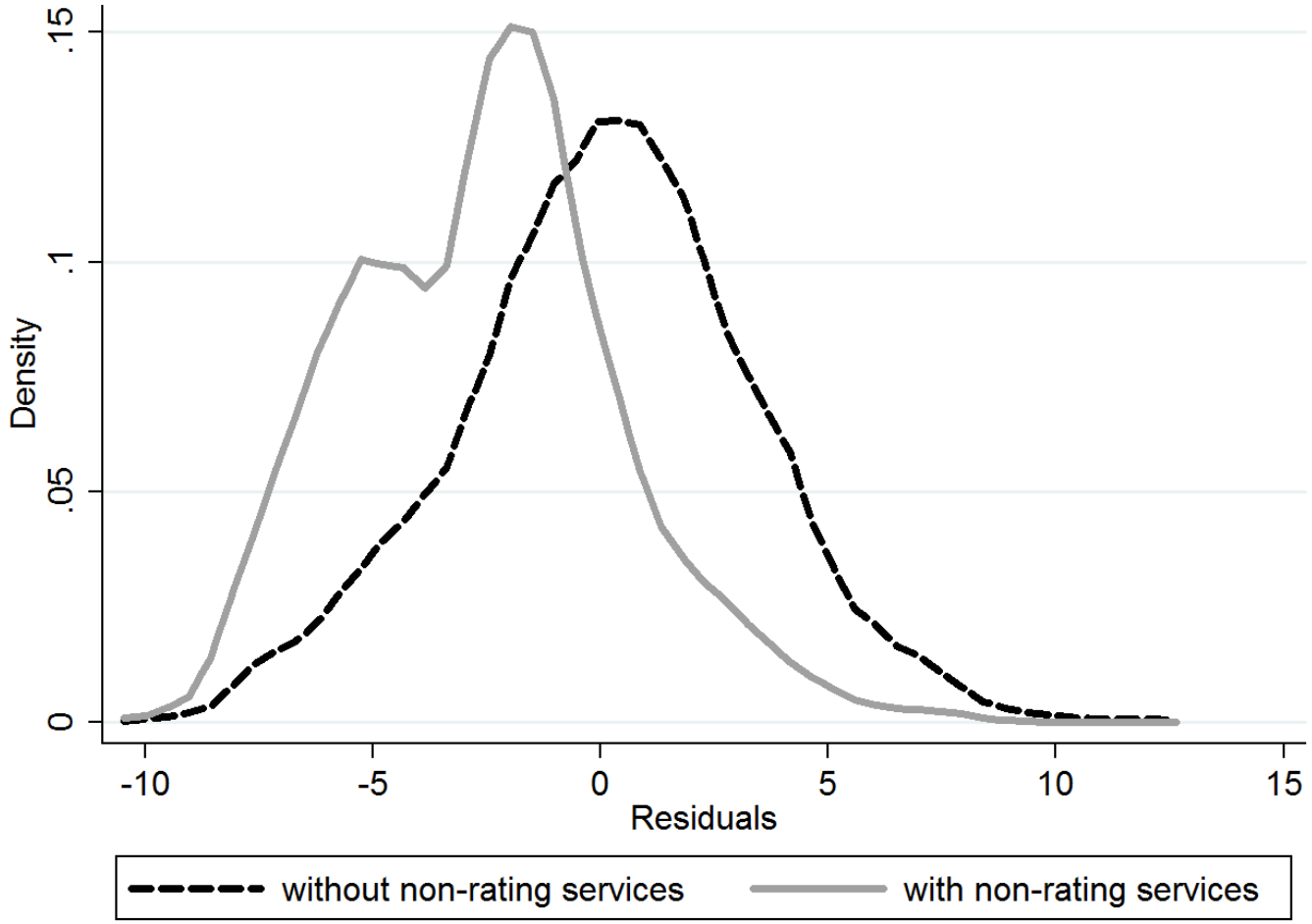

Figure 2. Non-rating revenue and ratings

This figure plots the *Rating Difference* (the difference between the *Issuer Rating* from one rating agency minus the cross-sectional average of the ratings obtained from the other agencies) against the variable *Non-rating Revenue* and fits a local polynomial smooth line. *Issuer Rating* and *Non-rating Revenue* are defined in Table 1.

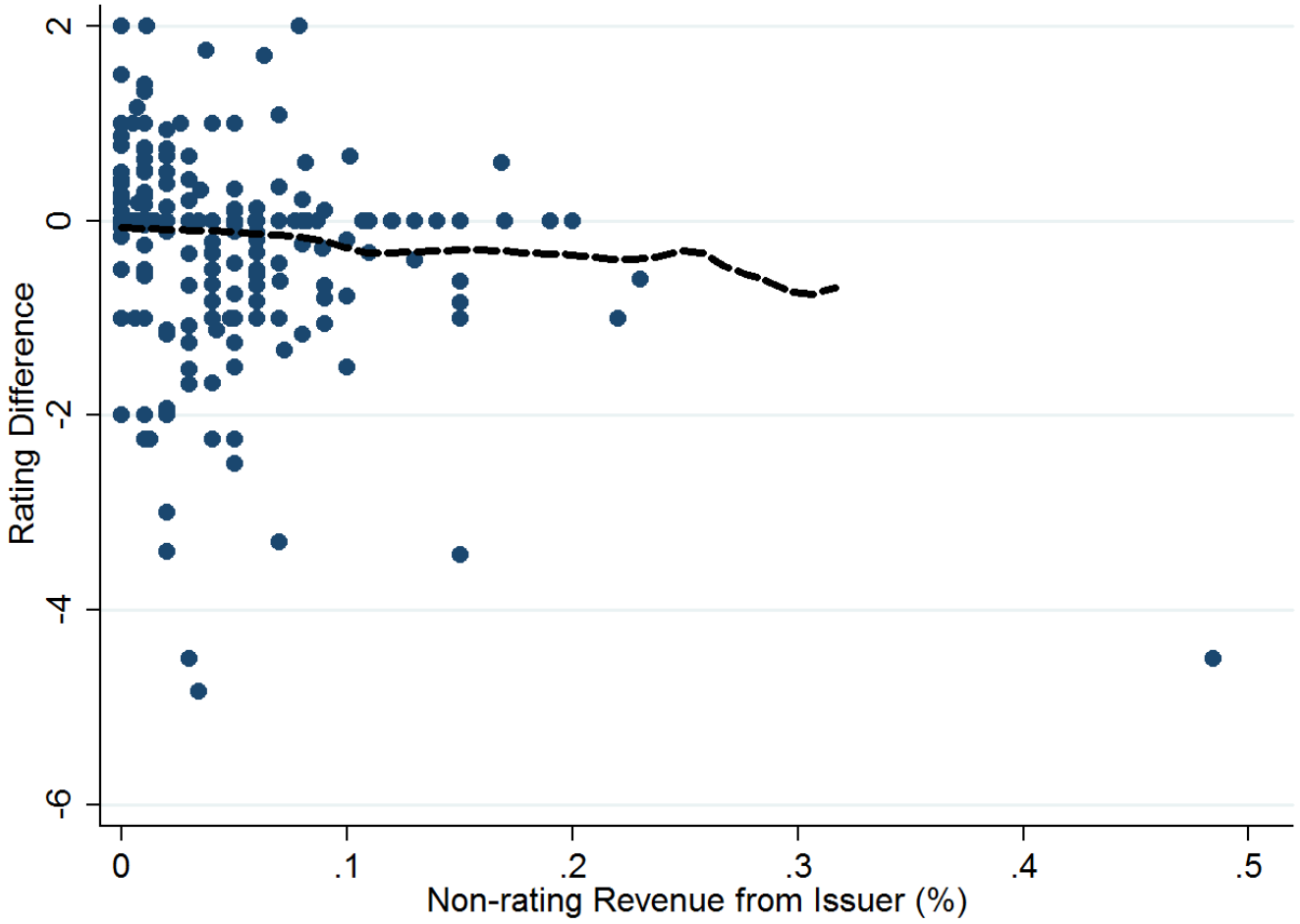

Figure 3. Ratings and default rates

The figure shows one-year default rates by rating category. Observations are divided into coarse *Issuer Rating* "buckets". For each of the rating categories, the fraction of firms that default in the following year is shown on the vertical axis.

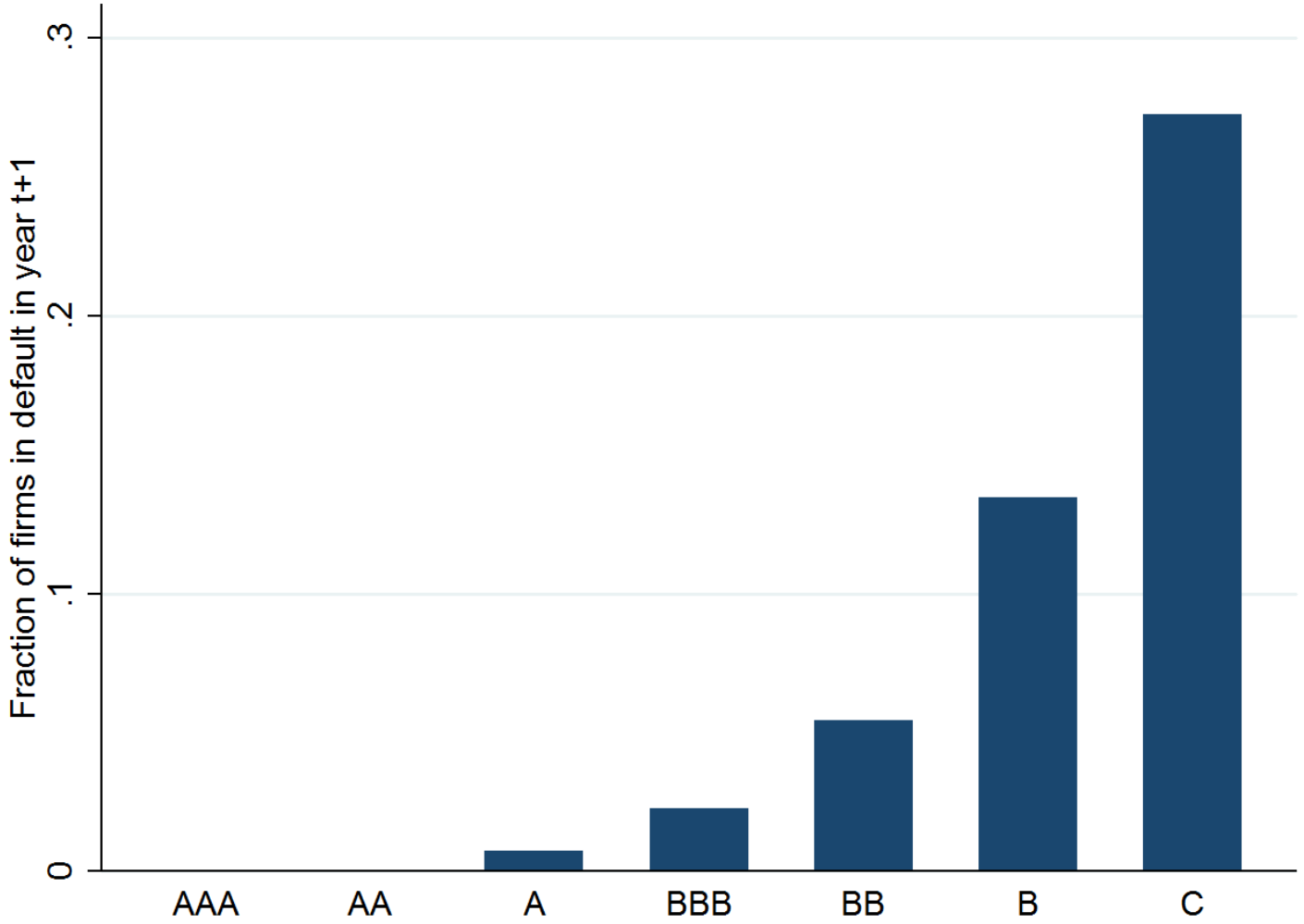

Figure 4. Ratings and default rates: the role of non-rating revenue

The figure shows one-year default rates by rating category; for each rating category, default rates are separately shown for firms that pay for non-rating services and those that don't.