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Does it matter who pays for bond ratings? Historical evidence ☆

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ABSTRACT

We test whether Standard and Poor's (S&P) assigns higher bond ratings after it switches from investor-pay to issuer-pay fees in 1974. Using Moody's rating for the same bond as a benchmark, we find that when S&P charges investors and Moody's charges issuers, S&P's ratings are lower than Moody's. Once S&P adopts issuer-pay, its ratings increase and no longer differ from Moody's. More importantly, S&P only assigns higher ratings for bonds that are subject to greater conflicts of interest, measured by higher expected rating fees or lower credit quality. These findings suggest that the issuer-pay model leads to higher ratings.

1. Introduction

This paper investigates whether charging bond issuers for credit ratings leads to higher ratings. The three major credit rating agencies—Standard & Poor's (S&P), Moody's Investor Service (Moody's), and Fitch—have been heavily criticized since 2002, when they failed to foresee the bankruptcies of Enron and WorldCom. During the recent financial crisis, the major rating agencies were again criticized for not providing accurate ratings for subprime mortgage-backed securities. Numerous commentators and policymakers argue that the issuer-pay revenue model drives the failure of rating agencies and that rating agencies should switch to an investor-pay revenue model. For example, according to Martin Wolf, chief economic commentator for the *Financial Times*, "It is [a] scandal that the model of payment for the credit rating agencies has not been changed. They should be paid by agents for the buyers not by the sellers" (Wolf, 2009). Ezra Klein of the *Washington Post* claims, "So long as sellers are funding the ratings, it's hard to imagine raters being totally deaf to their needs. Buyers need to fund the ratings" (Klein, 2009). One recent regulatory proposal calls for applying an "investor-pay" model to rating agencies (World Bank, 2009).

On the other hand, many do not believe the issuer-pay model is at fault. According to the Securities and Exchange Commission (SEC), "While the issuer-fee model naturally creates the potential for conflicts of interest and ratings inflation, most [hearing participants] were of the view that this conflict is manageable and, for the most part, has been effectively addressed by the credit rating

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agencies" (SEC, 2003, p. 23). Some argue that reputational concerns discourage rating agencies from engaging in any short-term opportunistic behavior. Indeed, Moody's claims, "We are in the integrity business" (House, 1995, p. 245), and S&P takes it one step further, claiming, "Our reputation is our business" (Tillman, 2007). The SEC concurs: "The ongoing value of a rating organization's business is wholly dependent on continued investor confidence in the credibility and reliability of its ratings, and no single fee or group of fees could be important enough to the organization to jeopardize its future business" (SEC, 2003, p. 13).

To date, little empirical evidence exists to substantiate either of these views, likely because since July 1974, when S&P switched from investor-pay to issuer-pay, revenue models across major rating agencies have lacked variation. We attempt to shed light on this issue by examining changes in bond ratings around the date that S&P adopted the issuer-pay model, four years after Moody's adoption in October 1970. Given that S&P and Moody's adopted the issuer-pay model at different times, we employ a difference-in-differences research design to examine how the two agencies' ratings for the same bond differ under the two revenue models.

Using a sample of 797 corporate bonds issued between 1971 and 1978 and rated by both S&P and Moody's, we find that, between 1971 and June 1974, when Moody's charged issuers for bond ratings and S&P charged investors, Moody's ratings are, on average, higher than S&P's ratings for the same bond. During the period both S&P and Moody's charge issuers for bond ratings—July 1974 through 1978—we find that Moody's ratings are *no longer* higher than those of S&P. Further analyses indicate that this change in the difference between the two agencies' ratings derives from an increase in S&P's ratings around 1974, rather than from any change in Moody's ratings. This finding supports the view that the issuer-pay model leads to higher bond ratings.

We also conduct cross-sectional analyses to examine whether S&P increases ratings more for bonds that have greater potential conflicts of interest than for other bonds. We use two proxies to capture conflicts of interest. First, because large and frequent bond issuers bring more revenues to a rating agency than other issuers, these issuers likely gain more bargaining power when they begin paying fees to S&P. Second, because Moody's always charges issuers during our sample period, within each Moody's rating class the low creditworthy bonds are more likely to receive their ratings with the influence of paying Moody's directly. We predict these bonds are more likely to receive higher ratings from S&P once they begin paying S&P directly. Our cross-sectional analyses support these predictions and show that the increase in S&P ratings, after adoption of the issuer-pay fee model, occurs only for bonds that likely generate higher fees and that have relatively lower credit quality within their Moody's rating group. The magnitude of S&P's rating increase is approximately 20% of a rating grade. This percentage roughly translates into a reduction in yield spread of 10 basis points, which, for the average bond issuance in our sample, would reduce a firm's interest costs by $51,000 per year. Using 1974 as the comparison point, this interest savings is equivalent to over $222,000 per year in 2010 inflation-adjusted dollars. Overall, the evidence regarding firms that received different initial ratings from the two agencies indicates that the issuer-pay model leads to higher bond ratings, and that this increase in ratings derives from inherent conflicts of interest.

Although our sample period is historical, our inferences are consistent with two contemporary studies that utilize recent data. Xia (2010) examines the impact of the issuer-pay model by comparing firms rated by S&P, which charges issuers, and Egan-Jones Rating Agency (EJR), which charges investors for ratings issued between 1999 and 2009. He finds that S&P assigns higher ratings than EJR, on average, and especially for firms that likely pay more rating fees.[1] Similarly, He, Qian, and Strahan (Forthcoming) examine mortgage-backed securities issued between 2000 and 2006 and find that Moody's and S&P issue more favorable ratings to large issuers, who likely generate more business and higher fees. Our study extends and complements the inferences in these papers by showing that the issuer-pay model affects credit ratings even in the 1970s. In addition, our difference-in-differences research design is more powerful in establishing a causal relation between the issuer-pay model and higher ratings. First, because we use Moody's ratings for the same bond as a benchmark to compare with S&P's rating. Second, because we compare the two agencies' ratings both before and after S&P adopts the issuer-pay model. Therefore, our research design presents a clean test of *whether* and *how much* the switch to the issuer-pay fee model influenced credit ratings in the past.

Our paper contributes to a growing body of literature that examines how various institutional arrangements affect credit ratings. As Pettit, Fitt, Orlov and Kalsekar (2004, p. 1) states, "Credit ratings and rating agencies are mentioned only in passing in most business schools and remain one of the most *understudied* aspects of modern corporate finance" (emphasis in original). The recent financial crisis has prompted a surge of research interest in credit rating agencies, particularly with respect to how the characteristics of the rating industry affect these agencies' performance (e.g., Becker and Milbourn, 2011; Kisgen and Strahan, 2010). Collectively, recent research suggests that new competition, the SEC's certification of rating agencies, and the agency's revenue model all affect credit ratings.

While it may not be realistic to abandon the issuer-pay model, the SEC can require bond issuers to disclose the amount they pay rating agencies for ratings and other consulting services. Such disclosure might alert investors to potential conflicts of interest. This type of disclosure requirement is similar to the Sarbanes–Oxley (SOX)

[1] Both Moody's and S&P are recognized by the SEC as Nationally Recognized Statistical Ratings Organizations (NRSRO), EJR is not until 2007. Thus, EJR's ratings are not incorporated in regulations in most of Xia's (2010) sample period. As Beaver et al. (2006) argue, the regulatory use of ratings from NRSRO has caused S&P's ratings to serve different purposes than those of EJR and led to the ratings that have very different attributes. It is not clear that the higher ratings from EJR are solely caused by the difference in the fee models.

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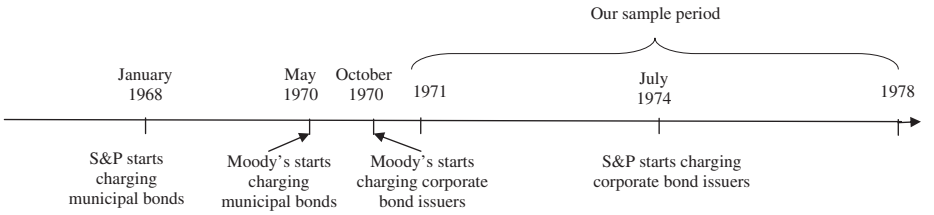

Fig. 1. Timeline of Moody's and S&P's change in revenue model. Change in revenue model refers to the change from investor-pay fee model to issuer-pay fee model.
Source: New York Times (January 27, 1968; February 3, 1968; and February 15, 1970); *Wall Street Journal* (February 15, 1968; October 1, 1970; and June 24, 1974).

requirement that firms disclose both audit fees and fees paid to auditors for non-audit services. Evidence in the accounting literature indicates that this audit fee disclosure requirement increased the transparency of the relation between firms and their auditors and reduced auditors' focus on non-audit related services. A similar requirement for bond rating agencies could increase transparency in the rating industry.

The rest of this paper proceeds as follows: Section 2 discusses why S&P and Moody's abandoned investor-pay and adopted the issuer-pay model; Section 3 describes the research design; Section 4 introduces the sample and presents the results; and Section 5 discusses alternative explanations and the robustness of the results; Section 6 concludes.

2. Motivations for the switch from the investor-pay to the issuer-pay fee model for bond ratings

When John Moody began issuing credit ratings for railroad companies in 1909, both Moody's and S&P generated revenue by selling ratings directly to investors. This investor-pay model was free of any conflicts of interest and helped build both agencies' reputations for integrity. However, in 1968, S&P began charging municipalities for ratings. Two years later, Moody's adopted an issuer-pay model for both corporate and municipal bond issuers. In 1974, S&P followed suit and began charging issuers for corporate bond ratings. Fig. 1 depicts the timeline of Moody's and S&P's changes in revenue model.

Several factors contributed to the switch from the investor-pay to the issuer-pay model for credit ratings. In the late 1960s, investor demand for credit ratings increased as more and more municipal and corporate debt was issued. As S&P notes in an article published in the *New York Times* on January 27, 1968, "municipal debt has grown from $2.9 billion to more than $113 billion in the past 20 years." During the first half of 1970, corporate bond issuances reached $14.1 billion, which represented a 52% increase over the same period in 1969 (*Wall Street Journal*, October 1, 1970). Further, the country's largest railroad company, Penn Central Transportation, declared bankruptcy on June 21, 1970, the largest bankruptcy in U.S. history at that time. As a result, shocked investors reacted by demanding credit ratings for new debt issues (Cantor and Packer, 1994).

At the same time, advances in information sharing technology—namely, the fax and the photocopy machine—exacerbated the free rider problem, which, in turn, prevented rating agencies from raising their subscription prices or increasing their circulation (White, 2002; US Senate, 2002). Xerox introduced the Xerox 914, the first automatic plain paper commercial copier, in a televised event in 1959. In 1966, Xerox introduced the first small, high-speed facsimile machine, the Magnafax Telecopier. These new technologies made it much easier for investors to share rating agencies' reports and lowered rating agencies' revenues from bond investors.

S&P reported losing between $150,000 and $200,000 on its municipal rating service in 1967 (*New York Times*, January 27, 1968). These losses raised concerns about the quality of S&P's ratings. According to a report published in the *Wall Street Journal* on October 1, 1970, some investment analysts began to question whether the rating agencies had sufficient staff and technological resources to meet the increased demand for their services. Immediately after S&P announced that it would initiate fees for municipal issuers, it began recruiting additional credit analysts (*New York Times*, February 15, 1970). At the same time that S&P announced it would charge corporate bond issuers, S&P began offering more refined ratings to reflect an issuer's "relative standing within the major rating categories," adding plus or minus to all corporate and municipal ratings below AAA and above BB (S&P, 1974, p. 616). S&P credited the new issuer-fee model with providing the resources that made these refinements possible (Ederington and Yawitz, 1987).

As the value of the rating agencies derives from their reputation for independent credit analysis and reporting, the issuer-pay model poses definite problems for independence, at least in appearance. For example, New York City's finance commissioner, Roy M. Goodman, questioned whether paid credit rating agencies would continue to rate impartially (*New York Times*, February 3, 1968). The perception of such potential conflicts of interest may partly explain why S&P did not choose to follow Moody's and extend its issuer-pay model to corporate bond issuers in 1970. At the time of Moody's announcement, S&P declared, "the income from the publications that carry our ratings and the expansion of our commercial paper rating activity enable us to provide corporate bond ratings without charge at this time"[2] (*Wall Street Journal*, October 1, 1970). However, in 1974, S&P announced that adopting issuer-pay was necessary to "offset the increasing costs incurred in

[2] Moody's parent company, Dun and Bradstreet, had another unit that processed commercial paper ratings at the time.

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meeting the growing demand for our rating services" (*Wall Street Journal*, June 24, 1974).

Moody's and S&P's ability to successfully implement an issuer-pay model reflects their market power and reputational capital. Newer and smaller rating agencies continued to rely on revenues from investors. For example, Duff and Phelps, which first began assigning non-public ratings in the 1930s, did not charge issuers until the 1980s (Ederington and Yawitz, 1987). Thus, issuers that did not value a Moody's or S&P rating could avoid paying for ratings by using another agency. However, when the SEC recognized Moody's and S&P as Nationally Recognized Statistical Ratings Organizations in 1975, this directly increased the regulatory use of credit ratings and gave the two agencies enormous power and prestige (Cantor and Packer, 1994; Partnoy, 1999). Very likely, this designation also made the issuer-pay model sustainable.

Although many technological and economic factors led to the switch from investor-pay to issuer-pay fees for credit ratings three decades ago, the question of whether this revenue model is associated with actual conflicts of interest remains an empirical one. Recent rating downgrades for bonds rated Aaa prior to the financial crisis have led some to speculate that the issuer-pay model has weakened rating agencies' due diligence and led to poor quality ratings. Both Congress and the SEC have considered ways to change the issuer-pay model. For example, SEC commissioner Elisse Walter suggests setting up a "revenue pool" from which rating agencies would be compensated (Westbrook, 2009). Although the newly passed Dodd–Frank Wall Street Reform and Consumer Protection Act does not address the issuer-pay model, it requires the Government Accounting Office to prepare a study of alternative ways of compensating rating agencies. It also asks the SEC to adopt new rules concerning the conflicts of interest that arise from rating agencies' sale and marketing practices.

In light of the above controversy, rating agencies contend that their concerns for reputation discourage them from engaging in any short-term opportunistic behavior. However, Buiter (2007, p. 4) argues that "even if the rating agencies expect to be around for a long time (a necessary condition for reputation to act as a constraint on opportunistic and inappropriate behavior), individual employees of rating agencies can be here today, gone tomorrow." Indeed, Partnoy (1999, p. 652) notes that both Moody's and S&P have a high staff turnover rate. Thus, reputational considerations may not effectively mitigate the potential conflicts of interest between bond raters and bond issuers.

Similarly, although rating agencies claim that they have installed firewalls between credit analysts' activities and rating fee discussions, these firewalls may not be effective. During a 2007 examination of the three primary rating agencies, Fitch, Moody's, and S&P, the SEC identified multiple cases wherein credit analysts had knowledge of the rating fee negotiations (SEC, 2008). These cases occurred after the agencies had supposedly improved their practices in response to public hearings in 2002 and the passage of the Credit Rating Agency Reform Act in 2006. Thus, the effectiveness of the agencies' firewalls and other governance mechanisms remains unclear.[3] In earlier periods, when rating agencies were not as closely monitored, the conflicts of interest were likely worse.

3. Research design

We use the historical setting wherein S&P changed its revenue model to investigate whether the adoption of the issuer-pay model leads to higher ratings. An ideal study would examine ratings changes before and after both Moody's and S&P began charging issuers in 1970 and 1974, respectively. Unfortunately, we are unable to locate complete data for bonds issued before 1970. Therefore, we focus on S&P's switch from investor-pay to issuer-pay in July 1974. We collect data on U.S. corporate bonds issued between January 1, 1971 and December 31, 1978. We end the sample period in 1978 to balance the two fee regimes (see Fig. 1 for the timeline).

During our sample period from 1971 to 1978, Moody's revenue model remains constant; they charge bond issuers for their ratings. In contrast, S&P charges investors in the first half of the sample period and issuers in the second half of the sample period. Thus, Moody's ratings serve as natural benchmarks for assessing how S&P's adoption of the issuer-pay fee model affects its ratings. For each bond, we calculate the difference between S&P's rating and Moody's rating and then test for a change in this difference before and after S&P adopts the issuer-pay model. To account for the possibility that Moody's and S&P have different rating methods, regardless of the revenue model, in model (1) we control for firm- and issue-specific characteristics used in prior research to explain bond ratings (Ahmed, Billings, Harris, and Morton, 2002; Blume, Lim and McKinlay, 1998; Campbell and Taksler, 2003; Kaplan and Urwitz, 1979; Pinches and Mingo, 1973). This yields the following model:

$$\begin{aligned} Ratingdif\ (Sprating - Mdrating) &= a_0 + a_1\, Post\,74 \\ &+ b_i\, Controls(Size, Leverage, Margin, Stdret, Issuesize, \\ &Maturity, and\ Senior) + c_i\ Post\ 74{*}Controls + Errors. \end{aligned} \quad (1)$$

wherein *Ratingdif* is S&P's rating minus Moody's rating for the same bond; *Sprating (Mdrating)* is S&P's (Moody's) initial bond rating, transformed into a number from 1 to 7, with greater numerical values corresponding to higher ratings; *Post*74 is an indicator variable that takes the value of one if a bond is issued between July 1974 and 1978 and zero otherwise; *Size* is the natural log of total assets at the end of year; *Leverage* is the book value of long-term debt plus the portion of long-term debt included in current liabilities divided by the book value of liabilities plus the market value of equity; *Margin* is operating income before depreciation divided by total assets at the end of year; *Stdret* is the standard deviation of daily stock returns during the year of the bond issue; *Issuesize* is the natural log of the value of the bond issue in millions of dollars; *Maturity* is the natural log of years to maturity; *Senior* is an indicator variable that

[3] See Frost (2007) for further discussion of these criticisms and a review of the academic evidence.

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takes the value of one if the bond is senior and zero otherwise. All variables and their sources are described in detail in the Appendix.

Our variable of interest is *Post*74, an indicator variable that takes the value of one if the bond was issued after July 1974, when S&P began charging issuers for credit ratings, and zero otherwise. We predict that if the issuer-pay model does lower S&P's rating standards, then S&P's ratings will increase relative to Moody's ratings after July 1974; a positive coefficient for *Post*74 would support this prediction. The intercept captures the average difference between S&P's rating and Moody's rating for the same bond during the period when only Moody's charges bond issuers, that is, the first half of the sample period. A negative intercept would be consistent with Moody's adoption of the issuer-pay model being associated with higher ratings (i.e., *Sprating* is less than *Mdrating*).

The control variables in model (1) allow S&P and Moody's to place different weights on the firm- and issue-specific factors affecting bond ratings. If both rating agencies use similar standards, then the coefficients will be close to zero. To facilitate interpretation of the intercept, we include each control variable's deviation from the sample average when estimating model (1), that is, we demean the control variables. Thus, the intercept is the average ratings difference for a bond with average sample characteristics rather than a bond whose size and other characteristics are zero.

A number of different scenarios could cause the coefficient of *Post*74 in model (1) to be positive. Such scenarios include both rating agencies increasing their ratings but by a different magnitude, S&P increasing its ratings over time while Moody's decreases its ratings, or S&P increasing its ratings over time while Moody's ratings remain stable. To further understand how ratings change over time, we also estimate model (1) using S&P's ratings and Moody's ratings as separate dependent variables. In these estimations, the intercept reflects the average ratings each agency assigns to a bond with average features. *Post*74, in this case, will capture the change in each agency's average rating over time. As Moody's charges issuers for credit ratings during the entire sample period, we do not expect the coefficient of *Post*74 to be different from zero when the Moody's rating is the dependent variable. In contrast, when the S&P rating is the dependent variable, if charging bond issuers for credit ratings does lead to higher ratings, then we would expect the coefficient of *Post*74 to be positive, indicating an increase in S&P's ratings.

The difference-in-differences research design described above is powerful with respect to eliminating the impact of general trends in credit ratings. However, it is still possible that changes in rating differences between the two sample periods are, in fact, due to changes in some omitted factor that affects bond ratings and occurred concurrently with the revenue model change. For example, S&P might have unilaterally changed its methodology for rating bonds around 1974 for reasons unrelated to its adoption of the issuer-pay model. To rule out such alternative explanations, we conduct cross-sectional tests of whether S&P increases ratings more for bonds that have greater conflicts of interest than for other bonds. We use two proxies to identify bonds that are more likely to exert significant pressure for better ratings.

Our first proxy for greater conflicts of interest is based on a bond's potential to generate more rating fees. Bond issues likely to generate more fees may receive higher ratings as a result. S&P and Moody's charge issuers based on the size of the issuance (SEC, 2003, p. 104; Smith and Walter, 2002, p. 302). It is also plausible that rating agencies will curry favor with frequent issuers. Consistent with these arguments, prior research uses both issue size and issue frequency to proxy for potential conflicts of interest between issuers and rating agencies (Covitz and Harrison, 2003; Kraft, 2011). If S&P does favor large and more frequent bond issuers, S&P will increase ratings for this set of bonds more than for other bonds when it adopts the issuer-pay model. Accordingly, we code *Highfee* as one if the bond issue size is greater than the median issue size and if the issuer issues bonds more frequently than the median frequency of bond issuances in our sample, and zero otherwise. A positive coefficient on the interaction between *Post*74 and *Highfee* would be consistent with S&P increasing ratings more for bonds that likely pay higher fees than other bonds.

Our second proxy for greater conflicts of interest is credit quality within each Moody's ratings category. When firms gain bargaining power through issuer pay, higher credit quality firms are more likely to use pressure to move up to the next rating category because their credit quality (compared to low credit quality firms in the same rating category) is closer to that of firms in the next higher rating category. Once they move into the next rating class, however, they become the low credit quality firms (i.e., bottom) in that new rating category. Therefore, to the extent we observe ratings under the influence of conflicts of interest, the low credit quality firms within a rating category are likely the beneficiaries of the issuer-pay fee model. During our sample period, Moody's always charges issuers directly and they assign relatively higher ratings than S&P before 1974. Thus, Moody's ratings already reflect the influence of conflicts of interest. Accordingly, we rank bonds within each Moody's rating category into those above and below the median credit quality for that category each year and predict that firms whose creditworthiness is below the median are more likely to improve their S&P ratings after they begin paying S&P directly.

We use operating profit margin (earnings before interest, taxes, depreciation, and amortization (EBITDA)/Total assets) as a proxy for creditworthiness because it is one of our main control variables in model (1) and one of the three variables in Kisgen's (2006) prediction model for bond ratings. To support this choice, we document that observations with lower profit margins receive higher yield spreads (consistent with these bonds having lower credit quality) and have higher leverage after controlling for credit ratings. The latter is consistent with evidence in Becker and Milbourn (2011, p. 13), who show that more highly levered firms received higher ratings, presumably due to increased pressure, when Fitch became a viable competitor in the industry in the mid-1990s. Thus, we

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code *Lowcredit* as one for observations whose profit margin is below the median for that Moody's rating grade each year, and zero for observations above the median. Our variable of interest is the interaction between *Post*74 and *Lowcredit*, a positive coefficient on this interaction would be consistent with S&P increasing ratings more for bonds with relatively lower credit quality within a Moody's ratings class than other bonds.

In model (2) below, we augment model (1) with the above two proxies for the potential to generate large conflicts of interest.

$$Ratingdif\ (Sprating - Mdrating) = a_0 + a_1\, Post\,74 + a_2\ Highfee(Lowcredit) + a_3\, Post\ 74{*}Highfee(Lowcredit) + b_i\, Controls + c_i\, Post\ 74{*}Controls + Errors. \quad (2)$$

In model (2), *Post*74 measures the change in the difference between S&P's and Moody's ratings after S&P adopts the issuer-pay model for bonds we classify as having low conflicts of interest (i.e., bonds that generate lower rating fees and those with relatively high credit quality). For bonds with high conflicts of interest, the change in the difference between S&P's rating and Moody's ratings is measured by the sum of *Post*74 and *Post*74∗*Highfee* (*Post*74-∗*Lowcredit*). Thus, the interaction term *Post*74∗*Highfee* (*Post*74∗*Lowcredit*) indicates whether, after its adoption of the issuer-pay model, S&P's ratings change more for bonds with high conflicts of interest than for other bonds. A significant positive coefficient on these interaction terms would indicate that S&P increased its ratings for bonds likely to suffer from greater conflicts of interest more than for other bonds. Finding a significant interaction term in this cross-sectional model would strengthen the inference that the increase in S&P ratings associated with the change in revenue models is due to conflicts of interest introduced by the issuer-pay model and not other factors.

We estimate models (1) and (2) using Ordinary Least Squares (OLS) because OLS facilitates interpretation of the coefficients. Despite the discrete nature of the dependent variables, OLS provides unbiased coefficient estimates. However, the OLS standard errors are biased due to non-homogeneous error terms. Accordingly, we calculate robust *p*-values after adjusting for heteroskedasticity. As robustness tests, we also estimate models (1) and (2) using ordered logit models; this and other robustness tests are discussed in Section 5.

4. Sample and results

We collect credit ratings and bond-specific characteristics from the Global New Issues database of the Securities Data Corporation (SDC). To ensure each rating's accuracy, we merge the SDC sample with both Moody's Default Risk Database and S&P's Credit Ratings Database. For bonds that either have different ratings in the SDC database than in these databases or are not found in these databases, we verify the original rating using Moody's and S&P's print publications: *Moody's Bond Survey*, *Bond Outlook*, and the *Fixed Income Investor*. We also merge the SDC sample with Compustat and The Center for Research in Security Prices (CRSP) to construct firm-specific variables likely to be used by rating agencies in assigning bond ratings. We start with 967 bonds with credit ratings available from both S&P and Moody's; after merging with Compustat and CRSP, our final sample consists of 797 bonds issued by 359 firms.

Untabulated analyses suggest that our sample represents fairly large companies with average total assets of $2.3 billion ($998 million for median). The mean (median) bond issuance is for $74 ($51) million in proceeds, with a maturity of 24 (25) years. More than 90% of our sample bonds are senior bonds with an investment grade rating from both Moody's and S&P.

We transform the original S&P and Moody's rating letters into numbers, with higher numbers indicating better quality ratings. Complicating this transformation is the fact that while S&P started offering more refined ratings in 1974, Moody's did not follow suit until 1982 (Kliger and Sarig, 2000; Tang, 2009). Therefore, during the second half of our sample period, Moody's ratings have broader categories than do S&P's ratings, which allow for the addition of a plus or minus to each letter rating (i.e., Aa+ and Aa−, etc.). To facilitate comparison, we convert the S&P ratings to the same broad categories used by Moody's. Table 1 presents the transformation of the alphabetical credit ratings to numerical ratings for both S&P and Moody's; as Table 1 indicates, the number of observations with the finer, within-category plus/minus rating is quite small. However, as discussed in Section 5,

Table 1
Distribution of new bond credit ratings in our sample period from 1971 to 1978.

Sprating and *Mdrating* are the numerical S&P and Moody's rating transformations. During our sample period, Moody's assigns only broad ratings (i.e., Aaa, Aa, A, Baa, Ba, B, Caa, Ca, and C). S&P begins assigning refined ratings (e.g., AA+ or AA−) in 1974. To consistently compare credit ratings both over time and across the two rating agencies, we ignore the refined S&P ratings and transform alphabetical ratings into numerical ratings based on Moody's broad rating categories. We believe this research design is conservative in terms of testing our hypotheses. We confirm that transforming the alphabetical ratings based on the refined ratings (i.e., from 1 to 17 rather than from 1 to 7) leaves our inferences unchanged. Our sample includes 797 new bonds issued between 1971 and 1978 that have both S&P and Moody's ratings and no credit-enhancement features.

S&P credit rating letter	Frequency (%)	Moody's credit rating letter	Frequency (%)	*Sprating* & *Mdrating*
AAA	6.02	Aaa	8.16	7
AA+	0.13			
AA	31.87	Aa	34.38	6
AA−	2.26			
A+	3.51			
A	34.38	A	38.27	5
A−	3.64			
BBB+	0.63			
BBB	10.16	Baa	12.55	4
BBB−	0.50			
BB+	0.25			
BB	2.13	Ba	2.76	3
BB−	0.63			
B+	0			
B	3.76	B	3.89	2
B−	0			
CCC	0.13	Caa/Ca/C	0	1

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deleting the plus/minus observations or coding the full range of observations does not change our inferences.

Table 2 presents descriptive statistics for several ratings comparisons. Consistent with prior studies on split ratings (Morgan, 2002), we find that around 83% of new bonds in our sample receive the same rating by S&P and Moody's: 661 bonds receive the same rating and 136 receive different ratings. What is striking about the results presented in Panel A is that for three of the four years when S&P charges investors (i.e., 1972, 1973, and 1974), S&P's ratings are significantly less favorable than Moody's ratings. Overall, before July 1974, S&P's ratings are lower than Moody's by about 11% of a rating grade. S&P's ratings continue to be lower than Moody's for the second half of 1974, but after that, significant differences between Moody's and S&P's ratings disappear.[4] These univariate results are consistent with an increase in S&P ratings, relative to Moody's, after S&P adopts the issuer-pay model.

Panel B of Table 2 presents the distribution of ratings across all rating grades both before and after S&P's revenue model switch. Non-bolded bonds on the diagonal receive the same rating from both agencies. Bolded bonds below (above) the diagonal indicate a rating that is higher (lower) from Moody's than from S&P. Of the 51 bonds with split ratings between 1971 and June 1974, Moody's gives 40 (78%) a higher rating than S&P. In contrast, between July 1974 and 1978, of the 85 split ratings, Moody's gives 43 bonds the higher rating while S&P gives 42 bonds the higher rating. Thus, these detailed ratings distributions are consistent with the evidence in Panel A, which shows that before S&P charges issuers, it assigns less favorable ratings than Moody's does and after it charges issuers, it assigns ratings similar to Moody's.

Panel C of Table 2 presents univariate tests of the average ratings difference between S&P and Moody's for each of Moody's ratings grades and the change in this difference after S&P adopts the issuer-pay model. Before July 1974, S&P's ratings are significantly less favorable for bonds rated by Moody's as Ba, Aa, and Aaa. After July 1974, S&P's ratings are still less favorable for bonds rated by Moody's as Aa; however, S&P now assigns more favorable ratings than Moody's does for bonds rated by Moody's as Baa and A. Relative to Moody's, S&P significantly increases its ratings for bonds rated by Moody's as Aaa ($p=0.03$, two-tailed) and marginally increased its ratings for bonds rated by Moody's as Baa ($p=0.06$, two-tailed). This evidence indicates that the increase in S&P's ratings around the date of its change in revenue model is dominated by bonds in the lowest and highest investment grades, Baa and Aaa; this finding is consistent with bonds in these categories exerting greater pressure to receive higher ratings. Although the benefits of upgrading from Aa to Aaa are likely less than an upgrading from non-investment to investment grade (i.e., from Ba to Baa), they probably exceed the benefits for other types of upgrades (such as from A to Aa or from B to Ba). The value of the Aaa rating is highlighted by the criticism that the triple-A rating for mortgage-backed securities enhanced their popularity in the recent financial crisis.

Panel D of Table 2 presents the distribution of ratings differences across our two proxies for bonds with the potential to generate large conflicts of interest, both before and after July 1974. Our first proxy for greater conflicts of interest is based on the size and frequency of firms' bond issues. We classify bonds from larger and more frequent bond issuers as *Highfee* bonds and all others as *Lowfee* bonds. After S&P adopts issuer-pay, the percentage of *Highfee* (*Lowfee*) bonds that receive a higher rating from S&P than from Moody's increases from 2% to 9% (5–7%). Likewise, after S&P adopts issuer-pay, the percentage of *Highfee* (*Lowfee*) that receive a lower rating from S&P than from Moody's decreases from 22% to 10% (11–7%). Overall, relative to Moody's ratings, S&P's ratings for bonds with low rating fees increases from -0.06 to 0.0 (i.e., by 6% of a rating grade), while S&P's ratings for *Highfee* bonds jump from -0.20 to -0.005 (i.e., by 20% of a rating grade). Thus, after S&P starts charging issuers, its rating increase is more pronounced for bonds expected to generate higher rating fees.

We find a similar pattern with respect to our second proxy for greater conflicts of interest, low credit quality within each Moody's rating category each year. For bonds with high creditworthiness there is no significant difference between Moody's and S&P's ratings, suggesting that high quality bonds receive unbiased ratings from both agencies. For bonds with low credit quality, during the pre-1974 period, S&P rates 22% lower than Moody's and only 1% higher. After S&P initiates issuer fees, they rate 9% of these bonds higher than Moody's and 12% lower. Overall, relative to Moody's ratings, the S&P rating for low credit quality bonds increases from -0.22 to 0.03 (i.e., by 25% of a rating grade).

Finally, Panel E of Table 2 presents univariate statistics on whether the rating improvement in the post-1974 period for bonds we classify as high conflicts of interest is stronger for bonds near the investment/non-investment rating border. Prior research shows that the distinction between investment grade and speculative grade ratings matters more than any other ratings differences. For example, Jorion, Liu, and Shi (2005) find a more negative stock market reaction when bonds are downgraded from investment grade to speculative grade than when they undergo any other type of downgrade. Kisgen (2006, p. 1062) finds that firms' credit ratings have a greater impact on their capital structure "at the investment grade to speculative grade credit rating distinction." Further, regulators discourage banks, insurance firms, and broker-dealers from holding speculative grade bonds by requiring more capital reserves. Thus, bonds close to the investment/non-investment borderline have the strongest incentives to push for better ratings from S&P.

Panel E indicates that the S&P ratings improve the most for bonds receiving a Ba or Baa rating from Moody's (Ba is the highest non-investment grade and Baa is the

[4] In addition, a rigorous test shows that none of the annual rating differences is statistically different from the pre-June 1974 period mean. Specifically, when we regress the ratings differences onto an intercept and a year dummy for each of the four years 1971, 1972, 1973, and the first half of 1974 individually, the coefficient on the year dummy is not significant in any year. Thus, the pattern that S&P's ratings are lower than Moody's ratings is prevalent in every year of the pre-June 1974 period and not driven by any single year.

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Table 2
Descriptive statistics.

The sample consists of 797 corporate bonds issued between 1971 and 1978 with a rating from both S&P and Moody's.

***, **, And * indicate it is significantly different from zero at $p < 0.01$, 0.05, and 0.10, respectively.

[1] In Panel C, the two-tailed *p*-values are from a t-test of whether the difference between S&P's ratings and Moody's ratings (*Ratingdif*) has changed significantly between the two sample periods.

[2] In Panel D, we use two proxies for the potential to generate large conflicts of interest. First, larger bond issuances (above the sample median) and bonds issued by firms that issue more frequently (more often than the sample median) are likely to generate higher fees for credit rating agencies. Second, issuers that have low credit quality (below the median profit margin within each Moody's rating category each year) have more incentives to push for the same ratings from S&P.

Panel A: Average rating differences for new bonds issued between 1971 and 1978

Year	Mean *Sprating*	Mean *Mdrating*	Mean *Ratingdif* (*Sprating* − *Mdrating*)	No. of obs. (Total = 797; N = 136 for *Sprating* ≠ *Mdrating*)
1971	5.65	5.69	−0.05	65
1972	5.10	5.19	−0.10**	84
1973	5.32	5.49	−0.17**	53
01/74–06/74	5.33	5.48	−0.15**	60
07/74–12/74	5.39	5.49	−0.10***	69
1975	5.26	5.26	−0.01	164
1976	5.14	5.13	0.01	123
1977	5.14	5.11	0.03	93
1978	4.43	4.40	0.03	86
Summary:				
1971–06/74	5.33	5.44	−0.11***	262
07/74–1978	5.093	5.095	−0.002	535

Panel B: Distributions of new bond ratings: from 1971 to June 1974 and from July 1974 to 1978 Observations on the diagonal receive the same rating from both agencies. Observations below (above) the diagonal receive a higher (lower) rating from Moody's.

	From 1971 to June 1974 S&P rating					
Moody's rating	B	BB	BBB	A	AA	AAA
B	3					
Ba	**3**	5				
Baa		**1**	23	**2**		
A			**4**	72	**8**	
Aa				**20**	94	**1**
Aaa					**12**	14

Of the 51 bonds receiving split ratings, S&P gives 40 bonds (i.e., 78%) a lower rating than Moody's does.

	From July 1974 to 1978 S&P rating					
Moody's rating	B	BB	BBB	A	AA	AAA
B	23	**4**				
Ba	**1**	12	**1**			
Baa		**2**	55	**17**		
A			**7**	196	**18**	
Aa				**24**	133	**2**
Aaa					**8**	31

Of the 85 bonds with split ratings, S&P gives 43 bonds (i.e., 51%) a lower rating than Moody's does. One bond rated CCC by S&P and B by Moody's is omitted from this panel.

Panel C: Rating differences across Moody's rating grades

	Observations		*Ratingdif* (*Sprating*–*Mdrating*)		Test of difference in pre- v. post-1974	
Moody's rating	Pre-July 1974	Post-July 1974	Pre-July 1974	Post-July 1974	Post − Pre	Two tailed *p*-values[1]
B	3	28	−0.00	0.11	0.11	0.18
Ba	8	14	−0.38*	−0.00	0.38	0.07
Baa	26	74	0.04	0.20***	0.16	0.06
A	84	221	0.05	0.05**	0.00	0.96
Aa	115	159	−0.17***	−0.19***	−0.02	0.57
Aaa	26	39	−0.46***	−0.21	0.25	0.03
Total	262	535	−0.11***	−0.002	0.11	0.00

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Table 2 (*continued*)

Panel D: Distributions of rating differences for bonds with a low or high potential for conflicts of interest[2]

	S&P > Moody's	S&P = Moody's	S&P < Moody's	Total	*Ratingdif* (*Sprating–Mdrating*)
For bonds with low expected fees (borrow less and borrow less frequently)					
Pre-74	9 (5%)	138 (83%)	19 (11%)	166	−0.06*
Post-74	24 (7%)	287 (86%)	24 (7%)	335	0.00
For bonds with high expected fees (borrow more and borrow more frequently)					
Pre-74	2 (2%)	73 (76%)	21 (22%)	96	−0.20***
Post-74	18 (9%)	163 (82%)	19 (10%)	200	−0.005
For bonds that have higher creditworthiness (above—median profit margins within each year and Moody's rating category)					
Pre-74	10 (8%)	112 (84%)	11 (8%)	133	−0.01
Post-74	11 (4%)	243 (89%)	20 (7%)	274	−0.03
For bonds that have lower creditworthiness (below—median profit margins within each year and Moody's rating category)					
Pre-74	1 (1%)	99 (77%)	29 (22%)	129	−0.22***
Post-74	31 (12%)	207 (79%)	23 (9%)	261	0.03

Panel E: Is the impact of conflicts of interest more pronounced when a bond is close to investment grade? Rating difference (S&P - Moody's) is reported in each cell with the number of observations in parentheses.

Using high expected fees (borrow more and borrow more frequently) to proxy for conflicts of interest				
		Pre-74	Post-74	Change from pre- to post-74
Moody's rating is *not* Ba or Baa	Low expected fees	−0.06* (134)	−0.02 (269)	0.05
	High expected fees	−0.20*** (94)	−0.07** (178)	0.14**
		Pre-74	Post-74	Change from pre- to post-74
Moody's rating is Ba or Baa	Low expected fees	−0.06 (32)	0.06 (66)	0.12
	High expected fees	0.00 (2)	0.50*** (22)	0.50***
Using low creditworthiness (below-median profit margins within each year and Moody's rating category) to proxy for conflicts of interest				
		Pre-74	Post-74	Change from pre- to post-74
Moody's rating is *not* Ba or Baa	High creditworthiness	0.00 (114)	−0.05** (228)	−0.05
	Low creditworthiness	−0.24***(114)	−0.02 (219)	0.22***
		Pre-74	Post-74	Change from pre- to post-74
Moody's rating is Ba or Baa	High creditworthiness	−0.05 (19)	0.07 (46)	0.12
	Low creditworthiness	−0.07 (15)	0.29*** (42)	0.35***

lowest investment grade rating) using both proxies for high conflicts of interest. When we proxy for conflicts of interest using high expected rating fees, bonds rated Ba or Baa by Moody's improve their S&P rating by half of a grade after S&P's fee change. In contrast, the largest improvement for other subgroups is only 14% of a rating grade. Similarly, when we proxy for conflicts of interest using low creditworthiness within each Moody's rating, bonds that are close to investment grade receive the largest S&P rating improvement (35% of a rating grade), which is also more than any other subgroup whose increase is at most 22% of a rating grade. Although finer partitions of the data result in a small number of observations for some of the tests in Table 2, the consistent pattern across the various tests strengthens our inferences that the issuer-pay model leads to higher credit ratings, especially for issuers that have the greatest incentives to seek higher ratings.

In sum, the univariate tests in Table 2 present consistent evidence that firms with the greatest incentives to pressure S&P for higher ratings received higher ratings after S&P initiated the issuer-pay fee model. Further, bonds that received higher S&P ratings, after the revenue model changes, are concentrated in rating categories that receive the most benefit from a rating upgrade. This is consistent with the issuer-pay model enhancing these bond issuers' bargaining power.

4.1. Regression results

Table 3 reports the results of estimating model (1). In columns 1 and 2, the dependent variable is *Ratingdif*, which is defined as S&P's rating minus Moody's rating. Column 1 reports the results of estimating model (1) using no control variables and column 2 reports the results using control variables at the firm- and issue-level, which allows the agencies to place different weights on these characteristics. We demean these control variables so that the intercept reflects the difference in ratings, in the pre-1974 period, for a bond with average values for these variables, as opposed to zero. The *Intercept* in column 2 is −0.16 (p-value = 0.11), which indicates that, for a bond with average firm and issue characteristics, S&P's rating is lower than Moody's rating by approximately 16% of a rating grade in the pre-1974 period when only Moody's charges issuers. *Post*74 measures the changes in S&P's ratings relative to Moody's ratings after 1974 when S&P adopts an issuer-pay model. The coefficients on *Post*74 are 0.11 (p-value < 0.01) in column 1 and 0.20 (p-value = 0.08) in column 2, both of which indicate that relative to Moody's ratings, S&P's ratings increase after its adoption of the issuer-pay model. The sum of *Intercept* and *Post*74 measures the difference between S&P's ratings and Moody's ratings after 1974. Untabulated tests for columns 1 and 2 indicate that S&P's

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Table 3
Test for whether S&P increases its ratings relative to Moody's ratings after S&P adopts the issuer-pay model in July 1974.

The sample consists of 797 corporate bonds issued between 1971 and 1978 with a rating from both S&P and Moody's. One-tailed robust *p*-values after adjusting for heteroskedasticity are in parentheses for variables with predicted signs including intercept and *Post*74 in column 1, 2, and 3. Two-tailed robust *p*-values after adjusting for heteroskedasticity are in parentheses for all other variables. *Post*74 is an indicator variable that takes the value of one when a bond is issued between July 1974 and 1978, the period wherein S&P charges issuers for ratings, and zero otherwise. Control variables include firm- and bond-specific characteristics and their interactions with *Post*74. These variables are described in the Appendix.

$$Ratings(Ratingdif, Sprating, Mdrating) = a_0 + a_1 * Post74 + b_i * Controls(Size, Leverage, Margin, Stdret, Issuesize, Maturity, and Senior) + c_i * Controls * Post\ 74 + Errors \quad (1)$$

	Ratingdif (=*Sprating*–*Mdrating*)		*Sprating*	*Mdrating*
Dep. variable:	(1)	(2)	(3)	(4)
Intercept	−0.11	−0.16	3.21	3.37
	(0.00)	(0.11)	(0.00)	(0.00)
*Post*74	0.11	0.20	0.39	0.19
	(0.00)	(0.08)	(0.06)	(0.43)
Size		−0.00	0.11	0.11
		(1.00)	(0.32)	(0.32)
*Post*74∗*Size*		0.01	0.09	0.08
		(0.81)	(0.43)	(0.52)
Leverage		0.05	−0.23	−0.27
		(0.90)	(0.72)	(0.62)
*Post*74∗*Leverage*		−0.32	−1.10	−0.78
		(0.41)	(0.10)	(0.19)
Margin		3.66	6.73	3.07
		(0.03)	(0.01)	(0.20)
*Post*74∗*Margin*		−4.31	−7.19	−2.88
		(0.01)	(0.01)	(0.25)
Stdret		−1.88	−45.71	−43.83
		(0.72)	(0.00)	(0.00)
*Post*74∗*Stdret*		2.13	10.75	8.62
		(0.73)	(0.31)	(0.39)
Issuesize		−0.01	0.23	0.24
		(0.85)	(0.16)	(0.14)
*Post*74∗*Issuesize*		−0.02	−0.06	−0.04
		(0.81)	(0.74)	(0.84)
Maturity		0.06	0.44	0.38
		(0.56)	(0.04)	(0.15)
*Post*74∗*Maturity*		−0.08	−0.41	−0.33
		(0.51)	(0.07)	(0.22)
Senior		0.08	2.23	2.15
		(0.55)	(0.00)	(0.00)
*Post*74∗*Senior*		−0.12	−0.59	−0.47
		(0.41)	(0.02)	(0.05)
With controls	No	Yes	Yes	Yes
Adjusted R^2 (%)	1	4	59	56

ratings are no longer significantly different from Moody's ratings, once both rating agencies charge issuers. The lack of significance for most of the control variables indicates that Moody's and S&P place similar weights on these firm and issue characteristics.

To further assess how the differences between S&P's ratings and Moody's ratings change over time, we re-estimate model (1), using S&P's ratings and Moody's ratings as dependent variables in columns 3 and 4. When S&P's rating is the dependent variable, the coefficient on *Post*74 is significantly positive (0.39, *p*-value=0.06), which indicates that S&P increased its average rating in the post-1974 period. In contrast, when Moody's rating is the dependent variable, the coefficient on *Post*74 is not significantly different from zero at 0.19 (*p*-value=0.43). The insignificant coefficient is consistent with the fact that Moody's rating fee model remains unchanged throughout the sample period and suggests that Moody's ratings did not change over time for other reasons. These results suggest that the decrease in the gap between Moody's and S&P's ratings is due to S&P increasing its ratings after adoption of the issuer-pay model.

Overall, consistent with the descriptive statistics, the results in Table 3 suggest that during the period when only Moody's charges issuers, Moody's bond ratings are higher than S&P's ratings. After S&P adopts the issuer-pay model, however, their ratings increase relative to Moody's such that they are no longer significantly different from Moody's. While we do not directly examine changes in Moody's ratings before and after its adoption of the issuer-pay model in October 1970, the comparison of Moody's ratings with S&P's ratings between 1971 and 1974 suggests that the issuer-pay model is associated with higher ratings, on average.

Table 4 presents the results of estimating model (2), which tests whether the increase in S&P's ratings documented in Table 3 is more pronounced for bonds that are more likely to suffer from greater conflicts of interest than for other bonds. This set of analyses helps to rule out the possibility that the observed increase in S&P's ratings derives from reasons unrelated to the change in revenue model. First, we classify bonds from larger and more frequent bond issuers as *Highfee* because they generate more revenue and likely have more bargaining power. Second, we classify bonds with lower credit quality within each Moody's rating category each year as *Lowcredit* because these bonds may have influenced Moody's to gain a higher rating. The interaction terms *Post*74∗*Highfee* and *Post*74∗*Lowcredit* measure whether, after adopting an issuer-pay model, S&P increases its ratings for *Highfee* and *Lowcredit* bonds more than for other bonds. Both terms are significantly positive (*p*-values ≤ 0.02) with or without the control variables. After controlling for firm and issue characteristics, on average, S&P increases its ratings for bonds coded as *Highfee* (*Lowcredit)* by approximately 19% (22%) of a rating grade more than for other bonds after the revenue model switch. In fact, S&P does not increase its ratings for other bonds after it adopts the issuer-pay model, as indicated by the insignificant coefficients on *Post*74 in columns 2 and 4. Thus, we find that S&P's adoption of an issuer-pay model affects only its ratings for bonds with the potential to generate greater conflicts of interest under the issuer-pay fee model.

At the bottom of Table 4, we present *F*-tests that compare the average S&P rating with the average Moody's rating for bonds with greater potential conflicts of interest both before and after 1974. We find that during the period only Moody's charges issuers, Moody's ratings are marginally higher than S&P's ratings for *Highfee* bonds ($p \leq 0.07$) and *Lowcredit* bonds ($p \leq 0.09$). However, in the period both S&P and Moody's charge issuers, Moody's

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Table 4
Test for whether S&P increases its ratings for bonds that have greater conflicts of interest more than for other bonds after S&P adopts the issuer-fee model in July 1974.

The sample consists of 797 bonds issued between 1971 and 1978 with a rating from both S&P and Moody's. One-tailed robust *p*-values after adjusting for heteroskedasticity are in parentheses for the first six variables in the table and two-tailed *p*-values for all others. *Post*74 is an indicator variable that takes the value of one if a bond is issued between July 1974 and 1978, during which time S&P charges issuers for ratings, and zero otherwise. *Highfee* is an indicator variable that takes the value of one if the bond issue size is greater than the median issue size and the bond issuer's issue frequency is greater than the median issuer's issue frequency in our overall sample, and zero otherwise. *Lowcredit* is an indicator variable that takes the value of one if the issuer's margin is below the median within each year and Moody's rating category, and zero otherwise. Control variables include firm- and bond-specific characteristics and their interactions with *Post*74. These variables are described in the Appendix.

$$Ratingdif\,(=Sprating-Mdrating)=a_0+a_1{*}Post\,74+a_2{*}Highfee(Lowcredit)+a_3{*}Post\,74{*}Highfee(Lowcredit)+b_i{*}Controls+c_i{*}Controls{*}Post\,74+Errors \quad (2)$$

	Ratingdif (= *Sprating–Mdrating*)			
Dependent variable:	(1)	(2)	(3)	(4)
Intercept	−0.06	−0.10	−0.01	−0.12
	(0.03)	(0.21)	(0.41)	(0.18)
*Post*74	0.06	0.12	−0.03	0.08
	(0.06)	(0.21)	(0.74)	(0.28)
Highfee	–0.14	–0.14		
	(0.01)	(0.04)		
*Post*74∗*Highfee*	0.13	0.19		
	(0.02)	(0.01)		
Lowcredit			−0.21	−0.11
			(0.00)	(0.08)
*Post*74∗*Lowcredit*			0.27	0.22
			(0.00)	(0.01)
Size		−0.02		−0.00
		(0.77)		(0.98)
*Post*74∗*Size*		0.03		0.01
		(0.62)		(0.86)
Leverage		0.15		0.03
		(0.69)		(0.94)
*Post*74∗*Leverage*		−0.47		−0.36
		(0.23)		(0.35)
Margin		3.55		2.40
		(0.03)		(0.25)
*Post*74∗*Margin*		−4.19		−2.51
		(0.01)		(0.24)
Stdret		−2.69		−2.08
		(0.61)		(0.71)
*Post*74∗*Stdret*		3.36		1.83
		(0.59)		(0.78)
Issuesize		0.07		−0.00
		(0.46)		(0.99)
*Post*74∗*Issuesize*		−0.13		−0.04
		(0.23)		(0.70)
Maturity		0.05		0.06
		(0.63)		(0.57)
*Post*74∗*Maturity*		−0.07		−0.07
		(0.57)		(0.52)
Senior		0.08		0.08
		(0.53)		(0.53)
*Post*74∗*Senior*		−0.12		−0.10
		(0.41)		(0.47)
Two-tailed *p*-value of *F*-tests for:				
S&P's average rating equal Moody's average rating for bonds coded as *Highfee* or *Lowcredit* **before** July 1974				
Intercept+*Highfee/Lowcredit*=0	0.00	0.07	0.00	0.09
S&P's average rating equal Moody's average rating for bonds coded as *Highfee* or *Lowcredit* **after** July 1974				
Intercept+*Post*74+*Highfee/Lowcredit*+*Post*74∗*Highfee/Lowcredit*=0	0.87	0.33	0.28	0.26
With controls	No	Yes	No	Yes
Adjusted R^2 (%)	2	4	4	4

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ratings no longer differ from S&P's ratings for bonds with the potential to generate large conflicts of interest (i.e., p-values range from 0.26 to 0.33).

To gauge the economic impact of S&P's adoption of an issuer-pay model, we regress yield spread on S&P's ratings to measure the change in yield spread as ratings move from one grade to another. Based on 179 observations for which both initial yield and comparable Treasury yields are available from SDC, we find that an improvement of one rating grade (e.g., from BBB to A) is associated with a 48-basis-point reduction in yield spread. Thus, an improvement of 20% of a rating grade translates into a reduction in yield spread of approximately 10 basis points. We estimate that for the median bond issue in our sample which is $51 million, interest costs would be reduced by $51,000 per year in 1974 or over $222,000 in 2010 inflation-adjusted dollars. On the one hand, this estimate may be conservative: a bond moving from a non-investment grade rating to an investment grade rating, for example, will have larger than average decreases in their yield spread. On the other hand, this estimate may be too optimistic: it ignores the role of Moody's ratings and assumes that the bond market does not see through the increases in S&P's ratings associated with its adoption of the issuer-pay model.

5. Robustness and alternative explanations

The results reported in Tables 3 and 4 are robust to several alternative specifications. First, the inferences remain unchanged if we re-estimate Eqs. (1) and (2), using an ordered logit model instead of OLS. Second, as some issuers appear in our sample more than once, we rerun our tests using clustered robust standard errors to adjust for any within-firm serial correlations. In this case, our inferences also remain unchanged. Third, to reduce concerns about an omitted time variable, we reduce the sample range around S&P's fee change from 1971–1978 to 1972–1977 and 1973–1976. The reduction of sample size prevents us from adding all control variables, but the main inferences in Table 3 remain the same without control variables and with as many control variables as the data allow us to include.

Fourth, to rule out the possibility that the results in Tables 3 and 4 are driven by the subordinated bonds, we replicate the analyses using only the senior bonds in Table 5, Panels A and B, respectively, restricting the sample to senior bonds. In Panel A the coefficients on *Post*74 are 0.10 (p-value < 0.00) in column 1 and 0.07 (p-value $= 0.07$) in column 2, both of which indicate that relative to Moody's ratings, S&P's ratings increase for senior bonds after its adoption of the issuer-pay model. Similarly, in Panel B the interaction terms *Post*74∗*Highfee* and *Post*74∗*Lowcredit* are significantly positive (p-values ≤ 0.02) with or without the control variables and are of similar magnitude to those reported in Table 4. Overall, the tests reported in Table 5 demonstrate that our inferences are robust to a sample composed of only senior bonds.

Finally, as discussed above, S&P began adding plus/minus rating categories gradually during the time period their revenue model changed (with some bonds never receiving a plus or minus before they matured or were called back). This concurrent event complicates our rating comparisons and potentially affects our inferences. Our research design deals with this concern in three ways. First, in our main analyses, when we transform the ratings letter to a number, we ignore the plus/minus rating. Specifically, as shown in Table 1, we assign the same numerical rating for an A+ and an A rating. This coding makes ratings comparable both between S&P and Moody's and between S&P's ratings before and after 1974. It also eliminates the question of whether an A+ issued after 1974 is a better rating than an A rating issued before 1974. As this coding ignores the additional information embedded in the plus/minus ratings, it is conservative and biases against finding support for the hypothesis that S&P issued higher ratings for similar bonds holding other things equal. Second, only 92 observations are issued with a plus or minus after 1974. When we delete these observations, our inferences remain the same. Third, when we rerun the analyses coding A+ as a higher number than A, all inferences remain the same (this coding assumes that a bond rated as an A by S&P before 1974 or by Moody's throughout the sample period is rated in the middle of the expanded A category). Overall, we believe these multiple approaches to S&P's rating refinement strengthen the paper and increase confidence in our results and inferences. However, we note that this is a limitation of the paper.

Although the difference-in-differences research design controls for firm and issue characteristics, it is possible that when firms begin paying S&P for ratings, they may also provide S&P with more information, increasing the overlap in the information sets given to Moody's and S&P. More overlap in the information given to the agencies would lead to smaller rating differences, consistent with the evidence in Table 3. In addition, more information should also lead to more informative and less dispersed S&P ratings under the issuer-pay model as compared to the investor-pay model.

We provide the following two analyses to empirically test this *more information* story.

First, we test whether the correlation between S&P's ratings and new bond yields becomes stronger after S&P began charging issuers. Using the change in the correlation between Moody's ratings and bond yields as the benchmark, S&P's ratings become more strongly associated with new bond yields after they begin charging issuers—its correlation with bond yields increased by 1% more than Moody's increased. Second, we test for a decrease in the dispersion of S&P ratings after the revenue model changes. Again, using Moody's change as a benchmark to filter out concurrent changes that affect both rating agencies, S&P's standard deviation decreased by 3% more than that of Moody's. These results indicate that S&P ratings became more informative and less dispersed after charging issuers, possibly due to S&P receiving more information.

However, the more information hypothesis does not fully explain our findings of an *increase* in S&P ratings after they begin charging issuers for two reasons. First, this hypothesis predicts a smaller difference between S&P and Moody's ratings after the fee change because both agencies receive the same information. If companies share more

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Table 5
Robustness test using only senior bonds.

The sample consists of 727 senior bonds issued between 1971 and 1978 with a rating from both S&P and Moody's. One-tailed robust *p*-values after adjusting for heteroskedasticity are in parentheses. *Post*74 is an indicator variable that takes the value of one if a bond is issued between July 1974 and 1978, during which time S&P charges issuers for ratings, and zero otherwise. *Highfee* is an indicator variable that takes the value of one if the bond issue size is greater than the median issue size and the bond issuer's issue frequency is greater than the median issuer's issue frequency in our overall sample, and zero otherwise. *Lowcredit* is an indicator variable that takes the value of one if the issuer's margin is below the median within each year and Moody's rating category, and zero otherwise. Control variables include firm- and bond-specific characteristics and their interactions with *Post*74. All control variables are included but not reported for brevity. These variables are described in the Appendix.

Panel A: Test for whether S&P increases its ratings relative to Moody's after S&P adopts the issuer-pay model in July 1974 using only senior bonds

$$Ratings(Ratingdif, Sprating, Mdrating) = a_0 + a_1 * Post\ 74 + b_i * Controls(Size, Leverage, Margin, Stdret, Issuesize, Maturity, and\ Senior) + c_i * Controls * Post\ 74 + Errors \quad (1)$$

	Ratingdif (=*Sprating*–*Mdrating*)	
Dep. variable:	(1)	(2)
Intercept	−0.11	−0.07
	(0.00)	(0.04)
*Post*74	0.10	0.07
	(0.00)	(0.07)
No. of observations	727	727
With controls	No	Yes
Adjusted R^2 (%)	1	5

Panel B: Test for whether S&P increases its ratings for bonds that have greater conflicts of interest more than for other bonds after S&P adopts the issuer-fee model in July 1974 using only senior bonds

$$Ratingdif(=Sprating-Mdrating) = a_0 + a_1 * Post74 + a_2 * Highfee(Lowcredit) + a_3 * Post\ 74 * Highfee(Lowcredit) + b_i * Controls + c_i * Controls * Post\ 74 + Errors \quad (2)$$

	Ratingdif (= *Sprating*–*Mdrating*)			
Dep. variable:	(1)	(2)	(3)	(4)
Intercept	−0.05	–0.02	0.01	–0.03
	(0.06)	(0.38)	(0.59)	(0.23)
*Post*74	0.04	−0.02	−0.05	−0.03
	(0.15)	(0.63)	(0.89)	(0.69)
Highfee	−0.15	–0.13		
	(0.00)	(0.05)		
*Post*74∗*Highfee*	0.16	0.22		
	(0.01)	(0.01)		
Lowcredit			−0.23	–0.11
			(0.00)	(0.10)
*Post*74∗*Lowcredit*			0.30	0.22
			(0.00)	(0.02)
No. of observations	727	727	727	727
With controls	No	Yes	No	Yes
Adjusted R^2 (%)	2	5	4	5

private information under the new fee structure and some of the private information is unfavorable, we should not necessarily observe the documented overall increase in S&P ratings. Prior literature shows that firms share both favorable and unfavorable news with rating agencies. For example, Jorion, Liu, and Shi (2005, p. 324) find that both rating upgrades and downgrades receive stronger market reactions after Regulation Fair Disclosure exempted firms from sharing non-public information with ratings agencies, suggesting that firms share both good and bad news.

Second, the more information hypothesis does not explain our cross-sectional results using the two proxies for high conflicts of interest. Specifically, we find that firms receiving higher S&P ratings in the post-1974 period are firms that likely pay higher rating fees (those that issue more debt and borrow more frequently) and/or have lower creditworthiness within a given Moody's rating grade. The more information story does not explain why S&P ratings increase more for these high conflict of interest firms.

6. Discussion and conclusion

In this study, we examine whether charging issuers for bond ratings is associated with higher credit ratings employing the historical setting wherein S&P switched

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Table A1
The credit ratings and other bond-specific variables are extracted from Securities Data Corporation's Global New Issues database. The issuer characteristics are constructed from Compustat and CRSP.

Sprating	The numerical Standard & Poor's rating transformation, from 1 to 7 with greater numerical values corresponding to higher ratings.
Mdrating	The numerical Moody's Investor Service (i.e., Moody's) rating transformation, from 1 to 7 with greater numerical values corresponding to higher ratings.
Ratingdif	The difference between Standard & Poor's credit rating and Moody's credit rating for a bond (*Ratingdif*=*Sprating*−*Mdrating*).
Post74	An indicator variable that takes the value of one if the bond is issued between July 1974 and 1978 and zero otherwise.
Highfee	An indicator variable that takes the value of one if the bond issue size is greater than the median issue size and the bond issuer's issue frequency is greater than the median issuer's issue frequency in our overall sample and zero otherwise.
Lowcredit	An indicator variable that takes the value of one if the issuer's operating profit margin is below the median within each year and Moody's rating category and zero otherwise.
Size	The natural log of total assets (Compustat data # 6) at fiscal year-end before a bond is issued.
Leverage	Long-term debt (Compustat data # 9) plus the current portion of long-term debt in current liabilities (Compustat data # 34) divided by the market value of total assets, calculated as the book value of assets (Compustat data # 6) minus the book value of equity (Compustat data # 216) plus the market value of equity (Compustat data #25*#199).
Margin	Operating income before depreciation (Compustat data #13) divided by total assets (Compustat data # 6) at fiscal year-end before a bond is issued.
Stdret	The standard deviation of daily stock return during the year of issuance (from CRSP).
Issuesize	The natural log of borrowing amount in millions of dollars.
Maturity	The natural log of years to maturity.
Senior	An indicator variable that takes the value of one if the bond is a senior claim and zero otherwise.

from an investor-pay to an issuer-pay model in 1974, four years after Moody's made the same switch. Many commentators and policy makers claim that charging bond issuers for ratings introduces conflicts of interest into the rating process. For corporate bonds issued between 1971 and 1978, we find that, for the same bond, Moody's rating is higher than S&P's rating prior to 1974 when only Moody's charges issuers. However, after S&P adopts the issuer-pay model in July 1974, the evidence indicates that S&P's ratings increase to the extent that they no longer differ from Moody's ratings. Because we use Moody's ratings for the same bond as our benchmark, we can conclude that this increase in S&P's ratings is not due to general changes affecting bond ratings.

Further, cross-sectional analyses show that S&P's ratings increase only for bonds with greater potential conflicts of interest under the new revenue model, i.e., for bonds that likely pay higher fees or have greater incentives to attain a higher rating. These results are consistent with bond issuers gaining bargaining power when they pay for ratings. The magnitude of the increase in S&P's ratings is approximately 20% of a rating grade, which is associated with a reduction in yield spread of roughly 10 basis points in our sample. This translates into interest savings of $51,000 per year in 1974 or over $222,000 in 2010 inflation-adjusted dollars. These findings are robust to various event windows and apply to bonds in various rating categories and to senior, versus subordinated, bonds.

While our evidence does not directly address the current ratings environment, it nevertheless suggests that the issuer-pay model might help to explain the poor performance of rating agencies with respect to structured financial products. Over the past three decades, Moody's and S&P have each expanded their services far beyond rating corporate and municipal bonds. They now assign ratings for banks and insurance firms (Doherty, Kartasheva, Phillips, 2008), syndicated bank loans (Sufi, 2009), and structured financial products such as collateralized-debt obligations and mortgage-backed securities (White, 2010). The issuer-pay model underlies all these new services. In fact, revenues generated from rating structured products accounted for the largest share of Moody's revenues in 2008.[5] If issuer-pay fees led to higher ratings in the 1970s, when rating fees were lower than they are today, the same mechanism could be at work now when the stakes are higher. In fact, Moody's Chief Executive Officer told directors in 2007 that Moody's "push to increase profitability posed a 'risk' to the quality of the ratings process" (Lucchetti and Burns, 2008).

Our research is subject to the following caveats. First, while we report multiple approaches for dealing with S&P's addition of plus/minus ratings during our sample period, it is still possible that with this refinement, S&P's ratings are not comparable to Moody's. Second, we did not examine whether the bond market prices the increase in S&P's ratings; future research on this topic will shed additional light on the consequences of adopting the issuer-pay model. However, bond ratings affect both investment restrictions and regulatory requirements directly. Even if the bond market did adjust for the increases in S&P's ratings owing to its adoption of the issuer-fee model, these increases could still impact issuers and investors. Third, we also cannot infer whether S&P's rating for a particular bond is too optimistic or pessimistic with regard to an objective *true* rating. We compare S&P's ratings to Moody's ratings only. While one may want to examine the extent to which the bond ratings can predict default, because defaults of corporate bonds are rare and generally occur long after the initial ratings are assigned, this is a difficult avenue to pursue.

Appendix. Variable definitions

See Table A1.

[5] According to Moody's 2008 annual report, 32% of Moody's revenues in 2008 came from structured finance ($405 m), exceeding revenues from corporate finance ($307 m), public finance ($230 m), and financial institutions ($263 m).

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