INFORMATION OPACITY AND FITCH BOND RATINGS

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Abstract

We examine the marginal impact of Fitch ratings on the at-issuance yields of industrial and utility bonds rated by Moody’s and Standard & Poor’s. We find that Fitch ratings reduce the yield premiums on information-opaque bonds by about 30%, or 15 basis points. The finding is robust even when a Fitch rating exactly equals the two major ratings or their average. The findings suggest that Fitch ratings are not redundant but bring additional information to investors. Increased competition in the rating industry enhances the information efficiency of the bond market, and the existence of smaller rating agencies is economically justified.

JEL Classification: G12, G24

I. Introduction

Until recently, the U.S. credit rating industry was dominated by two major rating agencies, Moody’s and Standard & Poor’s (S&P). To increase competition, the U.S. Securities and Exchange Commission has granted more rating agencies the status of Nationally Recognized Statistical Rating Organization in recent years. In addition, through industry consolidation and acquisition, Fitch has established itself as an alternative and viable competitor to the two major rating agencies. In 1997, Fitch merged with the London-based IBCA, a rating agency specializing in the financial industry. In 2000, Fitch acquired Duff and Phelps Credit Rating Co. and Thomson Financial BankWatch. Through both organic and inorganic growth, Fitch’s market share increased from about 10% in the mid-1990s to almost 50% today. In the meantime, Fitch ratings are increasingly accepted by investors. For example, the Lehman (now Barclay Capital) Corporate Bond Indices started to incorporate Fitch rating (in addition to those of Moody’s and S&P) into their classification of investment-grade bonds in 2005.

Acquiring a third rating from Fitch involves additional rating fees for issuing firms. Fitch has two rating fee arrangements. First, it charges a per issue rating fee, which ranges from $1,000 to $750,000 per issue. Second, an issuing firm can request ratings on
all or a number of its bond issues for an annual fee, which varies from $100,000 to $1,500,000 (Fitch 2016). The extra fees raise the question of whether issuing firms are well served by an additional rating from Fitch.

Our study investigates the value of Fitch bond rating by examining its impact on yield premiums of information-opaque bond issues. The value of an additional bond rating lies in its ability to reduce information asymmetry. Our primary hypothesis is that a third rating from Fitch, if information rich, will have differential impacts on information-opaque versus information-transparent bond issues: a more pronounced impact on the yields of information-opaque bonds than on the yields of information-transparent bonds.

Using a sample of 6,655 U.S. domestic, newly issued industrial and utility bond issues rated by both Moody’s and S&P from 2000 to 2014, we find that a Fitch rating reduces the yield premium on information-opaque bond issues by about 30%, or 15 basis points, but its effect on the yields of information-transparent bond issues is relatively minor. These findings are evidence that Fitch ratings contain valuable information that is appreciated and priced by investors in the industrial and utility bond markets and that increased competition in the rating industry benefits issuing firms and bond investors.1 The yield-reduction effect of a third rating is not due to potential selection bias. We use the instrument variable approach, Heckman’s (1979) two-stage treatment model, and propensity score matching to adjust for possible unobservable and observable selection bias. The yield-reduction effect of Fitch ratings is stronger after each of the treatments for possible self-selection bias.

A major reason why an extra rating provides additional information is that rating agencies provide detailed rating reports to their service subscribers or for a one-time fee in addition to the publicly available alpha-numerical ratings. Discussion with fund managers indicates that professional bond investors consider the rating reports informative and “extremely helpful” because they contain additional information not available from the letter ratings.

To further test the information content of a Fitch rating, we examine the special case where all three rating agencies assign the same rating or the Fitch rating matches the average of the Moody’s and S&P ratings. For these bonds, an additional Fitch rating does not improve the average rating but does potentially contain in its rating reports information not otherwise available to investors. In these cases, a Fitch rating does reduce yield spreads for information-opaque bonds, indicating that Fitch ratings contain information beyond that contained in the ratings of Moody’s and S&P.

Traditionally, credit rating agencies play the role of information providers and create economic value by their superior ability to analyze, aggregate, and transmit information about issuers’ default risk. Our empirical results suggest that a Fitch rating does provide valuable services for opaque bond issues and its additional information content is priced by market participants. Furthermore, our findings indicate that the yield-reduction effect of a Fitch rating is not solely driven by its regulatory function but is

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1 Our findings apply to the market for public offerings of industrial and utility bonds. The market for mortgage-backed securities and other structured finance products is relatively new and the dynamics of the rating process are different from those of traditional corporate bonds.
more broad-based and mainly a result of its additional information content. Hence, the existence of smaller rating agencies is economically justified. This point is important, particularly after the requirement by the Dodd–Frank Act to remove the use of bond ratings from all financial regulations.

II. Background and Related Literature

The main goal of this article is to examine the role of Fitch ratings in reducing information-opacity premiums on corporate bonds. In this section, we first review the literature on the effect of information opacity on bond yields. Then we briefly discuss the literature on the role and impact of additional bond ratings.

Opacity and Bond Yield Spreads

An extensive literature has shown that information-opaque firms face higher costs of capital. Many studies link information opacity with higher required rate of return on equities (e.g., Easley and O’Hara 2004). Other studies focus on the effect of information opacity on corporate bond yields. From a theoretical perspective, Duffie and Lando (2001) demonstrate that imperfect observations of firm assets can lead to bond yield premiums, particularly for short-term bonds.

Several empirical studies provide strong and direct evidence that firms with information-opacity problems have higher bond yield spreads. Morgan (2002) shows that Moody’s and S&P have higher proportions of split ratings in industries with greater information opacity. Livingston and Zhou (2010) use split bond ratings between Moody’s and S&P as a proxy for information opacity and find that split-rated bonds average a seven-basis-point yield premium over non-split-rated bonds of similar credit risk. The yield premium increases with wider splits, a stronger indicator of information opacity. In the same vein, Bonsall and Miller (2014) find that complexity of financial disclosure, or lack of transparency, is associated with a higher incidence of split ratings and higher cost of debt. Mansi, Maxwell, and Mill (2011) show that analyst forecast accuracy, forecast dispersion, and revision volatility affect bond yield spreads. Lu, Chen, and Liao (2010) use multiple measures of information opacity, including accrual quality, number of analysts, dispersion of analyst earnings forecasts, probability of information trading, and order imbalance. They find each of these opacity measures significantly affects bond yield spreads. Campbell and Taksler (2003) show that the standard deviation of a firm’s excess return over the market increases bond yield spreads.

In addition, an extensive literature documents that high-quality accounting disclosure, an important mechanism to reduce information opacity, can significantly reduce the opacity premium (see, e.g., Sengupta 1998; Yu 2005).

Additional Ratings and Bond Yield Spreads

Bond ratings are an important tool to reduce information opacity, and an extensive literature provides evidence that bond ratings contain information that is beyond publicly available accounting information and priced by investors (see, e.g., Holthausen and
Research in equity markets generally finds that the number of stock analysts is positively related to the speed of stock price reaction to new information and negatively related to the adverse selection component in the stock’s bid–ask spread. The indication is that more stock analyst coverage leads to higher information production (see, e.g., Brennan, Jegadeesh, and Swaminathan 1993; Brennan and Subrahmanyam 1995). In addition, studies have shown that stock prices react significantly to the initiation of new stock analyst coverage, further suggesting that additional analyst coverage brings more information to the market (see, e.g., Peterson 1987; Branson, Guffey, and Pagach 1998). The implication is that more bond ratings should result in better information, as bond ratings are forecasts of future defaults.

Some models of the bond market indicate that additional rating agencies are able to increase the information available to investors. Lizzeri (1999) and Doherty, Kartasheva, and Phillips (2012) argue that without sufficient competition, an incumbent rating agency may fail to distinguish between different issuers of bonds and will pool them into the same rating category. Doherty, Kartasheve, and Phillips (2012) examine the entry of S&P into rating insurance companies to compete with A.M. Best and find improvement in the rating process because of the competition from S&P. Xia (2014) examines the impact of the initiation of Egan–Jones ratings on the quality of S&P ratings. The author finds that the S&P ratings are more responsive to credit risk and become richer in their information content after increased competition from Egan–Jones.

More competition in the rating industry, however, does not necessarily lead to better quality ratings. A contentious issue is the issuer-pay model. Several theoretical and empirical studies suggest that greater competition might motivate rating agencies to provide unjustifiably high ratings to increase or maintain their market share (e.g., Skreta and Veldkamp 2009; Becker and Milbourn 2011; Bolton, Freixas, and Shapiro 2012; Opp, Opp, and Harris, 2013). However, a recent study by Bonsall (2014) suggests that the issuer-pay model helps build a stronger relation between the rating agencies and issuer firms, which “improves the flow of nonpublic information” and, consequently, enhances the information content of ratings (Bonsall, 2014, p. 89).

The existence of multiple rating agencies may afford the issuing firm opportunities to “shop” for ratings to obtain more favorable ratings. Becker and Milbourn (2011) find higher S&P ratings for industries with larger proportions of Fitch ratings, suggesting that a higher market share by Fitch ratings motivates S&P to raise its ratings. A recent study by Bae, Kang, and Wang (2015), however, challenges Becker and Milbourn’s findings by showing that Fitch tends to gain larger market share in industries with higher average ratings, particularly in regulated industries such as financials and utilities. Consequently, the findings in Becker and Milbourn are likely a result of industry effects, rather than “rating shopping” due to increased competition.

Another hotly debated issue is the regulatory role of bond ratings. Since the 1930s, many credit-rating-based financial regulations have been enacted, effectively bestowing the rating agencies with an unofficial regulatory function (Cantor and Packer 1995). Critics argue that the demand for multiple ratings is often not driven by the need for additional information content but by the ratings’ regulatory function. Bongaerts,
Cremers, and Goetzmann (2012) find that Fitch ratings do not have an effect on bond yields except for bonds on the border between investment-grade and junk ratings. As a result, Bongaerts, Cremers, and Goetzmann conclude that the value of a Fitch rating lies in its regulatory function. Kisgen and Strahan (2010) find that yields on bonds rated by DBRS react significantly to the acquisition of the Nationally Recognized Statistical Rating Organization status by DBRS in February 2003. The effect is particularly large for bonds rated near the investment-grade border.

III. Data Collection and Summary Statistics

To examine the impact of a Fitch rating on bond yields and its potential to reduce information-opacity premiums, we collect data on U.S. domestic, nonfinancial, public, and Rule 144A corporate bond issues with fixed-rate coupons from the Thomson Financial SDC database. Our data are for bond yields and bond ratings on the date of original issuance, when both the ratings of all three rating agencies and the bond yields are synchronized. The sample period covers 2000 to 2014. We start in 2000 because few bonds have Fitch ratings before 2000. In addition, prior research finds evidence of enhanced information content in bond ratings after Regulation Fair Disclosure took effect in 2000 (Jorion, Liu, and Shi 2005). All bond issues in our sample have ratings from both Moody’s and S&P. About half of the bond issues in the sample have different ratings from Moody’s and S&P, resulting in split ratings. We include all non-split-rated issues and split-rated issues where Moody’s and S&P ratings differ by one or two notches. We exclude issues with three or more notches of split ratings because there are very few observations in each of these rating combination categories. Perpetual bonds, bonds with credit enhancements, and putable bonds are excluded. We also eliminate several issues that are rated CCC—by any of the three rating agencies.\(^2\) The final sample consists of 6,655 bond issues. Among them, 3,279 bond issues (49.3% of the sample) have a Fitch rating and 3,376 issues (50.7% of the sample) do not.\(^3\)

Table 1 contains definitions of the variables used. Most variables are commonly used in the literature and are self-explanatory. All accounting variables are based on the fiscal year before the bond issue date. The analyst forecast variables are based on analyst earnings forecasts made nine months before the end of the fiscal year. Because the focus of our study is on the interaction between information opacity and Fitch ratings, we construct two measures of information opacity.

Opacity Measure

Many variables have been proposed as proxies for information opacity, such as analyst forecast errors and stock return volatility. However, because these individual variables are noisy proxies, we construct an asset Opacity Index based on four commonly used

\(^2\)We exclude these issues as a data quality filter. It is highly unlikely that firms with a CCC—rating are able to access the public bond market. Including these issues in our sample does not change our results.

\(^3\)We exclude several issues that have an additional rating from a third rating agency other than Fitch.
measures of opaqueness: firm size, standard deviation of analyst forecasts, analyst forecast errors, and stock return volatility. Because of different measurements and scales of the four variables and large outliers, we do not rely on their raw values. Instead, we construct Opacity Index as the average of the ranks of the four proxies:

\[
O_{i} = \frac{1}{N} \sum_{k=1}^{4} \text{Rank}_k (X_{i,k}),
\]

where \(X_{i,k}\) is the \(k\)th measure of opaqueness for bond issue \(i\) in the sample. The rank function ranks each observation from least opaque to most opaque. That is, the most
opaque issue gets a rank of \( N \) (\( N \) = number of sample observations) and the least opaque issue gets a rank of 1. We then average the ranks of the four proxies and scale this average by the number of observations. Thus, the most opaque (transparent) issue has a value of one (\( 1/N \)) and the sample mean is close to 0.5. The construction of Opacity Index is similar to Butler, Grullon, and Weston’s (2005) liquidity index. Finally, we demean the variable so that Opacity Index ranges from \(-0.5\) to \(0.5\), with a mean of 0. Table 2 reports the Pearson correlations between the bond Yield Spread, Opacity Index, and ranks of the four underlying proxies of opacity. By design, Opacity Index is highly correlated with the ranks of the four proxies. In addition, the four rank variables are also positively and significantly correlated with each other, validating the assumption that these four variables are noisy proxies for a common latent variable, that is, asset opacity. Finally, Opacity Index and its four components are all positively and significantly correlated with the bond yield spreads, consistent with prior research that opaque bond issues have higher yield spreads.4

A second measure of information opacity, Opacity Level, is based on Opacity Index. Opacity Level is an ordinal variable from 1 to 4. The value of the variable

| TABLE 2. Opacity Index Correlations. |
|--------------------------------------|
|                                       |
| Yield Spread | Opacity Index | Rank of Firm Size | Rank of Std. of Analyst Forecast | Rank of Analyst Forecast Error |
|--------------|---------------|-------------------|---------------------------------|-------------------------------|
| Opacity Index| 0.63          |                   |                                 |                               |
| Rank of Firm Size | 0.48          | 0.63              |                                 |                               |
|                 | (.00)         | (.00)             |                                 |                               |
| Rank of Std. of Analyst Forecast | 0.45          | 0.78              | 0.24                            |                               |
|                 | (.00)         | (.00)             | (.00)                           |                               |
| Rank of Analyst Forecast Error | 0.39          | 0.79              | 0.29                            | 0.61                          |
|                 | (.00)         | (.00)             | (.00)                           | (.00)                         |
| Rank of Stock Return Volatility | 0.53          | 0.73              | 0.30                            | 0.43                          |
|                 | (.00)         | (.00)             | (.00)                           | (.00)                         |

Note: This table reports the correlations between bond Yield Spread, Opacity Index, and the ranks of the four underlying variables of Opacity Index. Rank of Firm Size is the rank of firm size from largest to smallest, equal to 1 for the largest firm and \( N \) for the smallest, where \( N \) is the number of observations. Rank of Std. of Analyst Forecast is the rank of standard deviation of analyst forecast from lowest to highest, equal to 1 for firm with the lowest standard deviation of analyst forecast and \( N \) for firm with the highest standard deviation of analyst forecast. Rank of Analyst Forecast Error is the rank of analyst forecast error from the smallest to the largest, equal to 1 for firms with zero analyst forecast error and \( N \) for firm with the largest analyst forecast error. Rank of Stock Return Volatility is the rank of stock return volatility from lowest to highest, equal to 1 for firm with least volatile stock returns and \( N \) for firm with most volatile stock returns. Opacity Index is the demeaned average of the four rank variables scaled by sample size. The numbers in parentheses are \( p \)-values.

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4 As a robustness check, we use each component of Opacity Index as a proxy for information opacity and rerun all the empirical tests. The results based on individual measures of opacity are similar to those based on Opacity Index.
corresponds to the quartiles of Opacity Index, equal to 1 for bond issues with Opacity Index in the first quartile (the least opaque firms) and 4 for bond issues with Opacity Index in the fourth quartile (the most opaque firms).

**Descriptive Statistics**

Table 3 presents sample descriptive statistics for a variety of bond features for the whole sample, for issues without a third rating, and for issues with a third rating. There are a few noticeable differences between the issues with and without a Fitch rating. Issues with a Fitch rating have much larger average issue size ($538 million vs. $380 million) and longer maturity (13.32 years vs. 10.54 years). This pattern is not surprising because larger bond issues with longer maturities will benefit more from any potential decrease in

| TABLE 3. Sample Descriptive Statistics: Bond Features. |
|-------------------------------------------------------|
| **Panel A. Bond Features and Ratings**               |
| Mean of the Mean of the Mean of the Whole Sample No Third Third Rating Subsample Rating Subsample |
| Yield to Maturity (%)  5.72      6.23      5.19*** |
| (2.07)     (2.13)     (1.88) |
| Yield Spread (basis point) 214.03      247.80      179.26*** |
| (161.24)     (183.15)     (125.91) |
| Maturity 11.91      10.54      13.32*** |
| (9.03)      (7.42)      (10.24) |
| Proceeds (in million $) 458.11      380.43      538.09*** |
| (496.25)     (407.18)     (562.66) |
| Moody’s Rating 11.42      10.74      12.11*** |
| (3.30)      (3.91)      (2.53) |
| S&P Rating 11.52      10.90      12.16*** |
| (3.30)      (3.85)      (2.46) |
| Fitch Rating 12.43      n.a.      12.43 |
| (2.40)      (2.40)      (2.40) |

| **Panel B. Types of Bonds**                         |
|-----------------------------------------------------|
| Percentage of the Percentage of the Percentage of the Whole Sample No Third Third Rating Subsample Rating Subsample |
| Investment Grade 77.54% 67.15% 88.23*** |
| Split Rating 47.44% 47.30% 47.58% |
| Callable Bonds 14.49% 21.28% 7.59*** |
| Senior Bonds 95.58% 92.18% 99.09*** |
| Utility Issues 38.03% 31.34% 44.92*** |
| Rule 144A Issues 17.36% 25.80% 8.66*** |
| No. of obs. 6,655 3,376 3,279 |

Note: This table reports the summary statistics of the bond features for the whole sample and two subsamples: Third Rating (Fitch Rating) and No Third Rating Subsamples. A bond is classified as investment grade if either the Moody’s or S&P rating is BBB—or above. The numbers in parentheses are the variable standard deviations. ***Variable means of the two subsamples are significantly different at the 1% level.
yields caused by an additional Fitch rating. Conversely, an additional rating may not be cost effective for smaller issues and issues with shorter maturities because of a one-time rating fee as well as annual maintenance fees. Finally, about 45% of bonds with a Fitch rating are utilities, compared to only 31% of bonds without a Fitch rating.

To summarize the credit quality of the sample, we create three numerical rating variables: Moody’s Rating, S&P Rating, and Fitch Rating. The three variables range from 2 (for CCC) to 19 (for AAA). Higher numbers indicate higher ratings. The average Moody’s and S&P ratings are 11.42 and 11.52, or about BBB. The average Fitch rating is 12.43, or between BBB+ and A−. However, this higher average Fitch rating is misleading because Fitch rates only half of the bonds in the sample. The higher average Fitch rating is partly driven by the pattern that higher rated bonds are more likely to obtain a Fitch rating. For the subsample of bond issues without a third rating, the average Moody’s and S&P ratings are 10.74 and 10.90, respectively, significantly lower than the 12.11 and 12.16 average Moody’s and S&P ratings of bond issues with a third rating. Thus, for the subsample of bond issues that have all three ratings, the difference between the average Fitch rating and the average ratings from the two major rating agencies is less than one-third of a notch.

In addition, we find that Fitch ratings match either Moody’s or S&P ratings or both in most cases. For non-split-rated bonds with Fitch ratings, (i.e., bonds with same Moody’s and S&P ratings), Fitch ratings are the same as Moody’s and S&P ratings about 65% of the time and one notch higher about 24% of the time. About 7% of non-split-rated issues have a lower Fitch rating. For one-notch splits, 82% of the Fitch ratings match either the Moody’s or S&P ratings, and 14% of them are one notch higher than the higher of the two. Three percent of one-notch splits have a Fitch rating lower than both Moody’s and S&P ratings. For two-notch splits, 94% of the Fitch ratings are the same as either Moody’s or S&P or between them. Thus, Fitch ratings, in most cases, confirm one of the two major ratings or both. When Fitch ratings are higher, they are rarely more than one notch higher.

To compare bond yields, we subtract the yield for Treasury securities of similar maturity from the yield to maturity of each bond to get the Yield Spread. The average Yield Spread for the whole sample is about 214 basis points. The average Yield Spread for issues with a Fitch rating is significantly lower than that of the issues without a Fitch rating (179 basis points vs. 248 basis points). The difference in Yield Spread between the two subsamples is primarily due to the fact that bond issues rated by Fitch have higher average ratings.

Firms that acquire a third rating from Fitch may be different from firms that do not have a Fitch rating. Table 4 describes some of the differences between firms with and

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5 The Fitch rating is more than one notch higher than Moody’s and S&P ratings in about 3% of non-split-rated issues.

6 Some studies use the term “credit spread” to denote the difference between a bond’s yield and the yield on a Treasury security with similar maturity. The term “credit spread” may suggest that the difference in yields is purely the result of default risk. However, corporate bond yields are also affected by potential recovery rates in the event of default, lower liquidity than Treasury securities, and different tax treatments. We use the term “yield spread” to reflect all of differences between corporate and Treasury bonds.
without a Fitch rating. Issuers with third ratings have larger firm size and higher sales, and lower leverage and coverage ratios. These findings suggest that larger firms are more likely to obtain a third rating from Fitch. This pattern is consistent with earlier findings that larger bond issues are more likely to be rated by Fitch. There are two plausible explanations for this pattern. First, the additional rating fees are probably more affordable for larger firms. Second, because of their larger issue size, larger firms are more likely to benefit substantially from an additional rating.

### IV. Fitch Rating, Bond Yield Spread, and Potential Self-Selection Bias

In examining the impact of Fitch ratings on bond yield spreads, we run the following multivariate regression of bond Yield Spread on a Third Rating dummy variable, Opacity Index, and a set of control variables:

\[
\text{Yield Spread}_i = \alpha + \beta_1 \times \text{Third Rating}_i + \beta_2 \times \text{Opacity Index}_i + \text{control variables} + \epsilon_i. \quad (2)
\]

### Control Variables

To control for differences in credit quality, we create a 0/1 dummy variable for each rating combination of nonsplit and split Moody’s and S&P ratings, ranging from AAA to
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The regression models include 47 rating combination dummies. Because bond ratings are granular, the rating dummies are unlikely to capture all default-relevant public information. In addition, previous studies have shown that many factors other than default risk can have an impact on the yield spread. Thus, we include three sets of control variables in addition to the bond ratings: controls for issuer characteristics, controls for different bond features, and controls for market conditions.

To control for default risk not captured by rating dummies (or potential differences in default risk within a rating category), we include four firm characteristic variables that are commonly used to proxy for default risk: Leverage Ratio, return on assets (ROA), Coverage Ratio, and Log of Sales (see Table 1 for the definitions of the four variables). Previous studies suggest that firms with higher leverage ratios, lower ROA, and lower coverage ratios have higher default risk (see, e.g., Shumway 2001). In addition, larger firms generally have lower default risk. We use Log of Sales to proxy for firm size.

To control for differences in bond features, we include Log of Maturity, Log of Proceeds, Senior Bond dummy, Callable Bond dummy, and Utility Issue dummy variables in the regression model. Log of Maturity is the natural log of years to maturity. Previous studies find that yield spreads vary with bond maturity (e.g., Kidwell, Marr, and Thompson 1984; Chaplinsky and Ramchand 2004). Large bond issues are usually more liquid than small issues; consequently, investors may require lower rates of return for large bond issues. Hence, we expect the coefficient for Log of Proceeds to be negative. A Senior Bond dummy is set equal to 1 if the issue is senior debt, and 0 otherwise. Because senior debt is less risky than subordinated debt, the coefficient for the Senior Bond dummy is expected to be negative. The Callable Bond dummy variable is set equal to 1 if the bond is callable, and 0 otherwise. We expect a positive coefficient for this variable because callable bonds are riskier for investors. The Utility Issue dummy equals 1 if the issuer is a utility firm, and 0 otherwise. We also include an R144A Issue dummy, equal to 1 for Rule 144A issues, and 0 otherwise. Studies have found that Rule 144A issues have higher yield spreads than traditional public bond issues (see Livingston and Zhou 2002; Chaplinsky and Ramchand 2004).

Finally, because the bond default risk premium fluctuates with overall market conditions, we include a RISKPREM variable in the regression to control for changes in

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7 To save space, we do not report the coefficients on the rating dummies in Tables 5, 7, and 8.
8 Because we exclude issues with more than two notch split ratings from Moody’s and S&P, there are a total of 51 possible rating combinations. Among them, one rating combination (AAA/AA+) does not have any observations and three rating combinations (AA+, CCC+/CCC, and CCC) have fewer than 10 observations each. We combine these few issues with other bond issues in their nearest rating categories.
9 For example, Houweling, Mentink, and Vorst (2005) find a liquidity premium on corporate bonds. Fenn (2000) shows that issue size and maturity have an impact on bond yield.
10 A potential concern is the high correlation between the four firm characteristic variables and bond rating variables. Previous studies show that a large percentage of variation in bond ratings can be explained by issuing firms’ accounting ratios (see, e.g., Kaplan and Urwitz 1979). To address this concern, we drop the four variables from regression models and the results are essentially the same.
11 As a robustness check, we run the regression models without Log of Maturity. The results do not change materially. Different specifications of the variable do not affect the results either.
the market default risk premium. RISKPREM is defined as the difference between Moody’s BBB Corporate Bond Index Yields (obtained from the Federal Reserve website, https://www.federalreserve.gov/releases/h15/data.htm) and the yields for 10-year Treasury securities.\footnote{We use the Moody’s BBB Corporate Bond Index Yields to construct the RISKPREM variable because the average rating of the sample is about BBB. Using Moody’s AAA Corporate Bond Index Yields does not materially change our results.} We expect the coefficient for this variable to be positive. We also use year fixed effects to control for market conditions.

**Treatments for Potential Self-Selection Bias**

Column 1 of Table 5 reports the results of the multivariate regression of bond Yield Spread on Third Rating, Opacity Index, and control variables. First, note that the coefficient on Third Rating is $-8$ and statistically significant, suggesting that a Fitch rating, on average, reduces yield spreads by eight basis points. Second, the coefficient on Opacity Index is positive and highly significant, indicating that information opacity increases bond yields. This finding is consistent with previous studies on the link between information opacity and bond yields (Lu, Chen, and Liao 2010; Livingston and Zhou 2010). Most control variables have the expected signs, with the exception of the Senior Bond dummy.\footnote{The positive and significant coefficient for the Senior Bond dummy variable indicates that senior bonds have higher yields, a counterintuitive result that has been documented in other studies (see, e.g., Fenn 2000). Two explanations have been proposed in the literature and both relate to the rating agencies’ treatment of junior bonds (see Fridson and Garman 1997; John, Ravid, and Reisel 2010).}

A major challenge of the study is the potential selection bias. The issuing firm’s decision to acquire a third rating is not random, but very likely driven by some observable or unobservable issue/issuer characteristics. If these issue/issuer characteristics are also correlated with bond yields, the results in column 1 of Table 5 may be biased. We identify and address two scenarios of possible selection bias.

In the first case, the decision to acquire a Fitch rating is driven by positive information that is not observable and uncontrolled by researchers, but observable to investors. For example, a firm with high-quality and competent management might choose to have a Fitch rating if it believes the two major rating agencies fail to incorporate this positive information in their ratings. Because this positive information is observable to investors and, consequently, correlated with bond yields regardless of whether there is a Fitch rating, empirical results are unsound if the selection bias is not accounted for and corrected. We use the instrument variable (IV) approach and the Heckman’s (1979) two-stage treatment model to detect and correct for the selection bias due to uncontrolled issue/issuer characteristics that are not observable to researchers but observable to investors. The yield-reduction effect of Fitch ratings is stronger after each treatment for this possible self-selection bias.

In the second case, observable issue/issuer characteristics might determine a firm’s decision to acquire a Fitch rating as well as bond yields. For example, Tables 3 and 4 report that larger and higher credit quality firms are more likely to have a Fitch rating.
We use the propensity score matching (PSM) approach to address this potential selection bias due to observable issue/issuer characteristics and find our main results are robust.

**IV Analysis.** The basic idea of the IV approach is to identify one or more instrument variables that (1) determine the issuing firm’s decision to acquire a Fitch rating and (2) are not directly correlated with the \( \epsilon \), the error term in the bond yield spread regression of equation (2). Greene (2008) and Baum (2006) discuss the methodology and estimation techniques.

In identifying instrument variables for Fitch ratings, we take advantage of the fact that Fitch has gained market share gradually over the last three decades. For example, at the beginning of the sample period in 2000, only 31% of bond issues are rated by Fitch. Fitch’s market share increases to over 56% by 2014. Once a firm acquires a Fitch rating, it typically establishes a working relationship with the rating agency. Such

| TABLE 5. Third Ratings, Bond Yield Spreads, and Self-Selection Treatments. |
|-----------------------------------------------|
|                                              |
| Untreated Model                              |
| Instrument Variable Model                    |
| Heckman Selection Model                      |
| Intercept                                    | –148.35 (.00) | –142.69 (.00) | –152.18 (.00) |
| Third Rating                                 | –8.33 (.01)   |                | –18.27 (.00)  |
| Third Rating (Instrumented)                  |                | –20.45 (.00)  |                |
| Opacity Index                                | 143.27 (.00)  | 141.44 (.00)  | 141.04 (.00)  |
| Leverage Ratio                               | 41.57 (.03)   | 44.36 (.02)   | 44.24 (.02)   |
| ROA                                          | –0.30 (.45)   | –0.31 (.44)   | –0.31 (.44)   |
| Log of Sales                                 | 1.82 (.24)    | 2.34 (.15)    | 2.12 (.18)    |
| Coverage Ratio                               | 0.02 (.30)    | 0.01 (.42)    | 0.01 (.40)    |
| Log of Maturity                              | 15.69 (.00)   | 15.85 (.00)   | 15.86 (.00)   |
| Log of Proceeds                              | 3.78 (.06)    | 4.54 (.02)    | 4.43 (.03)    |
| Senior Bonds                                 | 60.10 (.00)   | 60.14 (.00)   | 60.32 (.00)   |
| Utility Issues                               | –3.81 (.38)   | –2.20 (.65)   | –2.59 (.57)   |
| Callable Bonds                               | 9.81 (.13)    | 9.54 (.10)    | 8.94 (.13)    |
| R144A Issues                                 | 9.68 (.06)    | 8.27 (.11)    | 9.44 (.07)    |
| RISKPREM                                     | 0.84 (.00)    | 0.84 (.00)    | 0.84 (.00)    |
| Inverse Mills Ratio                          |                |                | 8.07 (.03)    |
| Rating dummies                               | Yes           | Yes           | Yes           |
| Year dummies                                 | Yes           | Yes           | Yes           |
| No. of obs.                                  | 6,655         | 6,655         | 6,655         |
| \( R^2 \)                                    | 0.78          | 0.78          | 0.78          |
| Anderson canon. correl. statistic            | 2022.47       | (\( p\)-value = .00) |
| Hansen \( J \)-statistic                    | 1.048         | (\( p\)-value = .31) |

Note: This table investigates the potential self-selection problem in the relation between a third rating and the bond Yield Spread. In the first column, Yield Spread is regressed on Third Rating, Opacity Index, and other control variables without self-selection treatment. The control variables include all combinations of the two major ratings: Moody’s and S&P. Issues with BBB– ratings from both rating agencies are used as the base case. The regressions also include 14 year dummies, with 2014 as the base case. Other control variables are defined in Table 1. In the second column, we instrument the Third Rating dummy variable with two instrument variables: Prior Fitch Rating and Fitch Industry Market Share. In the third column, we use Heckman’s (1979) two-stage correction model. The results of the first-stage selection model is reported in Table B1 in Appendix B. Inverse Mills Ratio, based on the first-stage selection model, is added as a control variable to adjust for potential self-selection bias. The coefficients for the rating dummy variables and year dummies are not reported to conserve space. The \( p \)-values (in parentheses) are adjusted for potential clustering problems that might arise from multiple bond issues by the same firm.

We use the propensity score matching (PSM) approach to address this potential selection bias due to observable issue/issuer characteristics and find our main results are robust.
an existing relationship with the rating agency increases the likelihood of obtaining a Fitch rating on new bond issues. Conversely, a Fitch rating on a prior bond issue is unlikely to be correlated with the yield spread on a new bond issue. Thus, the first instrument variable is a dummy variable, Prior Fitch Rating, equal to 1 for bond issues whose issuer had a prior bond issue rated by Fitch, and 0 otherwise.14

The second instrument variable is Fitch Industry Market Share. Previous studies document significant cross-industry variation in Fitch market shares (Becker and Milbourn 2011; Bae, Kang, and Wang 2015).15 Firms are more likely to acquire a Fitch rating in an industry where Fitch has a higher market share, either because Fitch works hard to gain market share in specific industries or because issuing firms tend to follow the industry norm. Fitch Industry Market Share is defined as the percentage of bond issues in the one-digit Standard Industrial Classification (SIC) industry rated by Fitch in the previous calendar year. Fitch’s market share in a specific industry, particularly in the previous year, is unlikely to be directly correlated with error terms of the bond yield spread regression.16 Indeed, Bae, Kang, and Wang (2015) find that Fitch’s industry market share does not significantly affect bond yield spreads.

After we identify the two instrument variables, we employ the generalized method of moments estimation technique (Baum, Schaffer, and Stillman 2003).17 Column 2 of Table 5 reports the regression results when Third Rating is instrumented by Prior Fitch Rating and Fitch Industry Market Share. The coefficient on the instrumented Third Rating is −20 and statistically significant, indicating that the negative coefficient on Third Rating in column 1 is robust and not driven by potential self-selection bias. The coefficients on Opacity Index and the control variables remain essentially the same as those in column 1.

The soundness of the IV approach relies on two important factors: the validity and relevance of the instrument variables. The instrument variables are valid if they are not directly correlated with the error term of the bond yield spread regression and relevant if they are significant determinants of the decision to acquire a third rating. We perform two statistical tests to validate the use of the two instrument variables: Hansen J-statistic test and Anderson canonical correlation test.

The Hansen J-statistic tests for the validity of the instrument variables (Hansen 1982). The null hypothesis is that the instrument variables are not correlated with the error term of the yield spread regression. Table 5 reports a Hansen J-statistic of 1.05 and p-value of .31, failing to reject the null and indicating the two instrument variables are valid.

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14 We trace a firm’s bond issuance history to the beginning of the SDC database in 1983.
15 Bae, Kang, and Wang (2015) hypothesize that Fitch pushes harder to gain market shares in industries with larger and more frequent bond issues, such as the utility and financial industries. They find empirical evidence in support of this hypothesis.
16 Good instrument variables should meet two criteria: validity and relevance. We formally test the validity and relevance of the two instrument variables later.
17 We also use the two-stage least squares estimation technique. The empirical results are essentially identical. In addition, in the first-stage regression, the coefficients on the two instrument variables are significant in explaining the issuing firm’s decision to acquire a third rating. To conserve space, we do not report these results, which are available upon request.
The Anderson canonical correlation test checks for the relevance of the instrument variables (Anderson 1984; Hall, Rudebusch, and Wilcox 1996). The null hypothesis is that the instrument variables are not significantly correlated with the variable to be instrumented, that is, the Third Rating dummy variable. Table 5 reports an Anderson canonical correlation of 2.022 and *p*-value of .00, rejecting the null hypothesis. This indicates that two instrument variables are effective instruments for Third Rating.

**Heckman (1979) Two-Stage Correction Model.** The IV approach does not indicate the direction of potential selection bias. The second approach to adjust for potential self-selection bias is Heckman’s (1979) two-stage correction model. This two-stage treatment procedure is commonly used in the finance literature to address self-selection problems (see, e.g., Maddala, 1983, for technical details). An advantage of Heckman’s two-stage correction model is its ability to detect the direction of selection bias, if any. Appendix A gives an outline of the technique.

In the first stage, we build a probit model of the issuing firm’s decision to acquire a Fitch rating. The detailed specifications and the results of the probit model are presented in Appendix B. Two important explanatory variables in this first-stage probit model are the Prior Fitch Rating dummy and Fitch Industry Market Share, which are excluded in the second-stage model. These two variables are significant in explaining the issuing firm’s decision to acquire a Fitch rating, further supporting their use as instrument variables in the previous section.

Next, we calculate the Inverse Mills Ratio based on the first-stage probit selection model and then rerun equation (2) with Inverse Mills Ratio as an additional explanatory variable. If there is significant self-selection bias, the coefficient on Inverse Mills Ratio should be significantly different from zero. As discussed in detail in Appendix A, the sign of the coefficient indicates the direction of the possible bias. A negative (positive) sign of the coefficient on Inverse Mills Ratio indicates an upward (downward) bias in the coefficient of the Third Rating dummy without selection bias correction.

The last column of Table 5 reports the results of Heckman’s (1979) second-stage yield spread regression with Inverse Mills Ratio as an additional explanatory variable. First, note that the coefficient on Inverse Mills Ratio is positive and significant.\(^{18}\) Thus, there is some evidence of selection bias. However, the direction of the bias suggests that a simple ordinary least squares (OLS) regression would underestimate the effect of a third rating on yield spread. Not surprisingly, after treating for such selection bias, the coefficient on the Third Rating dummy variable becomes much larger (−18.27 in Heckman’s two-stage correction model and −20.45 in the IV model).

**PSM Analysis.** Instrument variables and Heckman’s (1979) correction model mitigate potential selection bias due to uncontrolled issue/issuer characteristics. There may also be potential selection bias from observable issue/issuer characteristics. For example, Tables 3 and 4 indicate that bonds with a Fitch rating have higher ratings than

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\(^{18}\) Because the Inverse Mills Ratio is a function of the Third Rating dummy, there is a potential concern of multicollinearity problem (Lennox, Francis, and Wang 2012). We check the variance inflation factor for every explanatory variable and none of them is greater than 5, alleviating concerns of multicollinearity (Belsley, Kuh, and Welsch 1980; Greene 2008).
Moody’s and S&P. In addition, firms acquiring a Fitch rating are significantly larger and have lower leverage ratios. Conceivably, larger firms with higher credit ratings are more likely to acquire a third rating, resulting in selection bias from observable issue/issuer characteristics. Although the OLS regression model in column 1 of Table 5 controls for differences in various issue and issuer characteristics, the regression approach assumes a linear relation between the explanatory variables and the dependent variable. In this section, we use the PSM method to adjust for the selection bias from observable issue and issuer characteristics.

The PSM method was first developed by Rosenbaum and Rubin (1983) and is increasingly used in accounting and financial studies (Tucker 2010). The basic idea of PSM is to match a bond with a Fitch rating (treatment observation) with a bond issue without a Fitch rating but with similar observable issue/issuer characteristics (control observation). Then, the yield spreads of the two bonds are compared. Matching may be difficult or impossible when the number of observable covariates (e.g., issue and issuer characteristics) is large and some covariates are continuous. To solve this problem, Rosenbaum and Rubin propose matching by the probability of receiving treatment (having a Fitch rating), or a propensity score.

Following similar procedures as in Massoud et al. (2011), we implement the PSM analysis in several steps. First, we estimate a logit model of the issuing firm’s decision to acquire a Fitch rating. The explanatory variables include issue characteristics (log of maturity, log of issue proceeds, Moody’s ratings, etc.) and issuer characteristics (log of firm size, ROA, leverage ratio, industry dummies, etc.). The logit model has the same set of explanatory variables as the probit model in the first stage of Heckman’s (1979) correction model, as reported in Appendix B.19

In the second step, we calculate each bond issue’s propensity score, or probability of receiving a Fitch rating, based on the results from the logit regression. Then, we match each bond issue with a Fitch rating with another bond without a Fitch rating but with the closest propensity score (nearest neighborhood matching within a 0.03 caliper). The matching observation is chosen from the control sample (bonds without Fitch ratings) with replacement. Table 6 reports the sample means of the issue and issuer characteristics for the bonds with Fitch ratings (treatment sample) and the matching sample (matching bonds without Fitch rating). It is clear that the two samples are very similar in terms of credit quality, firm size, profitability, leverage ratio, issue size, maturity, and other aspects. Hence, analysis based on these two samples is less prone to potential selection bias resulting from significant differences in observable issue and issuer characteristics.

Finally, we estimate the treatment effect of having a Fitch rating. The average pairwise difference in bond yields between issues with a Fitch rating and their matching issues is −16.22 basis points. The difference is statistically significant, indicating that bonds with a Fitch rating enjoy a 16-basis-point reduction in yield as compared to similar bonds without a Fitch rating.

19 The empirical results from the logit model are essentially the same as those from the probit model. For brevity, we do not report the results from the logit regression.
Summary of Self-Selection Treatments. From the IV analysis, Heckman’s (1979) two-stage treatment model, and PSM analysis, we conclude that the yield reduction effect of a third rating from Fitch is not driven by potential selection bias, either due to observable or unobservable issue and issuer characteristics. Indeed, the potential selection bias tends to mask the Fitch rating’s yield-reduction effect. To be conservative, we report subsequent results based on untreated models. The results based on Heckman’s two-stage treatment models, reported in Appendix B, are generally stronger.

V. Fitch Rating, Information Opacity, and Bond Yields

Although we address the potential selection bias problem econometrically, we recognize that the average Fitch rating is slightly higher than Moody’s and S&P ratings for bonds rated by all three rating agencies. This suggests that firms with undue lower ratings from Moody’s and/or S&P, or firms with inherently lower credit risk than indicated by the two major ratings, are more likely to acquire a third rating to better reflect their true credit risk. However, this does not necessarily pose a selection bias problem.

Suppose an issuing firm has good private information that it cannot credibly reveal to investors directly. If Moody’s and S&P ratings do not effectively incorporate the positive private information, the issuing firm may choose to reveal this information to investors indirectly through a Fitch rating and its rating report. In this case, there is no selection bias and no correction is necessary. Selection bias is a concern only when some variables are correlated with both the bond yields and the decision to acquire a third

### TABLE 6. Propensity Score Matching Analysis.

|                        | Treatment Sample  | Matching Sample  |
|------------------------|-------------------|------------------|
|                        | (Issues with Third Ratings) | (Issues without Third Ratings) |
| Yield Spread           | 179.26            | 195.48           |
| Propensity Score       | 0.72              | 0.72             |
| Log Firm Size          | 9.66              | 9.64             |
| ROA                    | 4.95%             | 4.98%            |
| Leverage Ratio         | 0.18              | 0.19             |
| Coverage Ratio         | 11.80             | 12.58            |
| Maturity               | 13.32             | 13.21            |
| Proceeds (in million dollar) | 538.09           | 529.03           |
| Moody’s Rating         | 12.11             | 12.27            |
| S&P Rating             | 12.16             | 12.31            |
| % of Split Rating      | 47.58%            | 46.57%           |
| % at Investment-Grade Border | 3.45%          | 4.82%            |
| % at Near Change        | 34.92%            | 35.59%           |
| % with Prior Fitch Rating | 81.85%          | 82.37%           |
| No. of obs.            | 3,279             | 3,279            |

Note: This table reports the issue and issuer characteristics of bonds with a third rating (treatment sample) and a matching sample of bonds without a third rating (matching sample). The matching is based on the propensity score, or the probability of having a third rating. The propensity score is estimated from a logit third rating selection model. The logit model has the same set of explanatory variables as the probit model in Table B1 in Appendix B. Each bond issue with a third rating is matched with a bond without a third rating with the closest propensity score. The matching observations are chosen from the control group (those without Fitch rating) with replacement.
rating. By definition, the private information, if not captured by Moody’s and S&P ratings, is not observable to investors and, consequently, not correlated with bond yields without a Fitch rating.

Indeed, the yield-reduction effect of Fitch rating is due to the positive private information contained in the rating or the rating report (not due to the rating itself). Without a Fitch rating, investors will not take the positive private information into consideration and the yield will be higher than otherwise (i.e., higher than if investors could observe the private information). With an informative Fitch rating and rating report, investors incorporate the positive private information and, as a result, demand a lower yield. This is exactly the economic function of the rating agency.

The implication is that not all firms will benefit from a Fitch rating. If a firm has no positive private information, it will not matter whether it has a third rating. It is the unobservable, positive private information contained in the Fitch rating and rating report that reduces the yield.

To test this, we investigate the differential impact of a Fitch rating based on the issuing firm’s information opacity by analyzing the interaction among opacity, Fitch rating, and bond yields. Previous studies find that rating agencies are more likely to disagree with each other on ratings of information-opaque bond issues (Morgan 2002; Livingston, Naranjo, and Zhou 2007), suggesting opaque firms have more difficult-to-assess private information. Consequently, we hypothesize that a Fitch rating, if information rich, will have a more pronounced impact on yields of information-opaque bond issues. Conversely, a Fitch rating will have little impact on bonds issued by information transparent firms.

**Empirical Results**

To test whether an additional Fitch rating can reduce the opacity premium, we add an interaction term between Opacity Index and Third Rating in model 1 of Table 7. The coefficient on the interaction term is negative and significant. A comparison of the magnitude of the coefficient on the Opacity Index and the coefficient on the interaction term indicates that a third rating from Fitch reduces the opacity yield premium by about 32%. This finding suggests that third ratings help lower information opacity yield premiums on opaque bond issues.

Because Opacity Index is a number from \(-0.5\) to \(+0.5\), the magnitude of the coefficient on Opacity Index does not have a simple intuitive interpretation. Therefore, model 2 in Table 7 uses Opacity Level, an ordinal variable from 1 to 4. The value of the variable corresponds to the quartiles of Opacity Index, equal to 1 for the least opaque firms and 4 for the most opaque firms. Thus, the coefficient on Opacity Level can be interpreted as the increase in yield spread when an issuing firm moves from one quartile to the next of Opacity Index. The coefficient of 21.25 on Opacity Level indicates that the most opaque issues have an average yield premium of about 64 (21.25*3) basis points versus the most transparent issues. The negative coefficient of \(-7.28\) on the interaction between Opacity Level and Third Rating shows that having a third rating from Fitch reduces the opacity premium by approximately 34% (i.e., \(\frac{-7.28}{21.25}\)).
TABLE 7. Impact of Third Ratings on Bond Yield Spreads.

|                      | Model 1 | Model 2 | Model 3 | Nonborder Subsample | Nonsplit Subsample | Split Subsample |
|----------------------|---------|---------|---------|---------------------|-------------------|----------------|
| Intercept            | –150.32 (.00) | –163.86 (.00) | –171.82 (.00) | –151.32 (.00) | –164.70 (.00) | 210.20 (.00) |
| Third Rating         | –9.09 (.01) | –6.58 (.03) | –8.17 (.01) | –3.72 (.36) | –12.65 (.01) |               |
| Opacity Index (OI)   | 168.37 (.00) |               | 165.28 (.00) | 147.52 (.00) | 191.93 (.00) |               |
| OI*Third Rating      | –53.81 (.00) |               | –50.00 (.00) | –47.26 (.02) | –57.17 (.02) |               |
| Opacity Level (OL)   |          |          | 21.25 (.00) |               |                   |               |
| OL*Third Rating      |          |          | –7.28 (.00) |               |                   |               |
| Opaque Issue w/Third Rating |          |          | 13.81 (.00) |               |                   |               |
| Opaque Issue w/o Third Rating |          |          | 28.84 (.00) |               |                   |               |
| Transp. Issue w/Third Rating |          |          |          | –5.83 (.07) |                   |               |
| Leverage Ratio       | 38.50 (.04) | 58.78 (.00) | 71.49 (.00) | 34.95 (.07) | 27.86 (.30) | 46.40 (.06) |
| ROA                  | –0.29 (.45) | –0.43 (.33) | –0.51 (.27) | –0.26 (.49) | –0.31 (.38) | –0.31 (.54) |
| Log of Sales         | 1.82 (.25) | 0.75 (.63) | 0.13 (.32) | 2.09 (.18) | 2.29 (.17) | 1.13 (.63) |
| Coverage Ratio       | 0.02 (.20) | 0.02 (.19) | 0.02 (.21) | 0.02 (.21) | –0.00 (.97) | 0.02 (.33) |
| Log of Maturity      | 15.97 (.00) | 16.03 (.00) | 15.94 (.00) | 16.18 (.00) | 18.11 (.00) | 13.98 (.00) |
| Log of Proceeds      | 3.76 (.06) | 3.28 (.12) | 2.85 (.18) | 3.67 (.07) | 0.51 (.78) | 7.72 (.00) |
| Senior Bonds         | 60.20 (.00) | 65.30 (.00) | 68.37 (.00) | 60.85 (.00) | 89.55 (.00) | 39.90 (.00) |
| Utility Issues       | –4.06 (.34) | –6.77 (.13) | –8.61 (.06) | –3.73 (.39) | –1.74 (.69) | –5.88 (.36) |
| Callable Bonds       | 8.79 (.13) | 8.88 (.14) | 8.58 (.16) | 8.88 (.13) | 11.10 (.12) | 6.07 (.49) |
| R144A Issues         | 9.03 (.08) | 9.64 (.07) | 10.19 (.06) | 8.97 (.09) | 7.35 (.31) | 10.95 (.12) |
| RISKPREM             | 0.85 (.00) | 0.87 (.00) | 0.89 (.00) | 0.84 (.00) | 0.83 (.00) | 0.88 (.00) |
| Rating dummies       | Yes      | Yes      | Yes      | Yes      | Yes      | Yes      |
| Year dummies         | Yes      | Yes      | Yes      | Yes      | Yes      | Yes      |
| No. of obs.          | 6,655    | 6,655    | 6,655    | 6,476    | 3,498    | 3,157    |
| $R^2$                | 0.78     | 0.78     | 0.78     | 0.78     | 0.78     | 0.78     |

Note: This table reports the regression analysis of the impact of a third rating on information-opaque versus information-transparent bond issues. The dependent variable is the bond Yield Spread in basis points. The control variables include all combinations of the two major ratings: Moody’s and S&P. Issues with BBB− ratings from both rating agencies are used as the base case. The regressions also include 14 year dummies, with 2014 as the base case. Other control variables are defined in Table 1. In model 1, the test variables are Third Rating, Opacity Index (OI), and their interaction term. In model 2, the test variables are Third Rating, Opacity Level (OL), and their interaction term. Model 3 has three test variables: Opaque Issue w/Third Rating (Transp. Issue w/Third Rating) equals 1 for issues with a Fitch rating and Opacity Index greater than (less than) the sample median, and 0 otherwise; Opaque Issue w/o Third Rating equals 1 for issues without a Fitch rating and Opacity Index greater than the sample median, and 0 otherwise; and issues with no Fitch rating and Opacity Index less than the sample median are the base case. The last three columns report model 1 specifications on three subsamples. The nonborder subsample excludes 179 bond issues with Moody’s and S&P ratings split at the investment-grade border. The nonsplit subsample (split subsample) contains bond issues where Moody’s and S&P ratings are identical (different). The $p$-values (in parentheses) are adjusted for potential clustering problems due to multiple issues by the same firm.
Correspondingly, the regression model includes three dummy variables for the first three cases: Opaque Issue w/Third Rating, Opaque Issue w/o Third Rating, and Transp. Issue w/Third Rating. Transparent issues without a third rating are used as base cases. The coefficient on Transp. Issue w/Third Rating is $-5.83$ and marginally significant, meaning that third ratings only have a relatively minor impact on the yields of information-transparent bond issues. The positive and significant coefficients on Opaque Issue w/Third Rating and Opaque Issue w/o Third Rating indicate that opaque issues have a yield premium over transparent issues. However, the yield premium on opaque issues with a third rating is 15 basis points lower than the yield premium on opaque issues without a third rating. The difference is statistically significant. This provides further evidence of a significant reduction in yield spread as a result of having a third rating from Fitch for information-opaque bond issues.

The 15-basis-point reduction in yield is also economically significant. Table 3 reports that the average size of the bonds in our sample is $458$ million, with an average maturity of 11.9 years and yield to maturity of 5.72%. The modified duration for the average bond is approximately 8.5. Thus, a yield reduction of 15 basis points translates to an increase of 1.275% of bond prices, or $5.84$ million. As a comparison, Fitch charges rating fees from $1,000$ to $1,500,000$.

Bongaerts, Cremers, and Goetzmann (2012) find that an additional Fitch rating lowers yield spreads only for bonds whose Moody’s and S&P ratings are split at the investment-grade border but do not have an impact on other bonds in general. Bongaerts, Cremers, and Goetzmann argue that the reduction in yield spreads for investment-grade-border bond issues is the result of the regulatory role of Fitch ratings. To check whether our results are driven exclusively by such a regulatory role of Fitch, we exclude all the bond issues split rated at the investment-grade border and rerun the model 1 regression. The results for the non-investment-grade-border subsample in Table 7 are almost identical to those of the whole sample, indicating that our results are not driven solely by investment-grade-border cases.

Finally, we analyze split and non-split-rated bonds separately in Table 7. Previous studies find split-rated bonds are likely to have more severe opacity problems (Morgan 2002). Thus, it is plausible that the effect of a Fitch rating might be more pronounced for split-rated issues. The last two columns of Table 7 report the results of the model 1 regression on the two subsamples. For the non-split-rated subsample, the coefficient on the Third Rating dummy, though negative, is not statistically significant. Conversely, the corresponding coefficient for the split-rated sample is $-12.65$ and highly significant. The interaction term between Opacity Index and Third Rating has a negative and significant coefficient in both subsamples. These empirical results suggest that the yield-reduction effect on information-opaque bond issues holds for both split- and non-split-rated bonds. The results from the non-split-rated subsample further indicate that the yield reduction effect of a Fitch rating is not driven by the investment-grade-border split-rated issues.\

\[^{20}\text{For the split-rated issue sample, we run a separate regression without the investment-grade-border splits and the empirical results remain essentially the same. To conserve space, we do not report the results, which are available upon request.}\]
Bae, Kang, and Wang (2015) find that Fitch has higher market shares in regulated utility and financial industries where the average ratings are also higher. As a robustness check, we run the model 1 regression for the utility and industrial bond issues separately. The empirical results (untabulated to conserve space) are similar between utility and industrial subsamples, suggesting our main results are not unique to regulated or unregulated industries only.

Relative Fitch Ratings and Yield-Reduction Effects

A potential concern is the possibility that the opacity premium reduction effect of Fitch ratings documented in the previous section is driven by the slightly higher average Fitch ratings. In this section, we examine the bond-yield-reduction effect at different Fitch rating levels relative to Moody’s and S&P ratings.

Depending on the level of Fitch rating, we create three test variables: High Third Rating, Low Third Rating, and Same Third Rating. High Third Rating (Low Third Rating) is set to 1 if the Fitch rating is higher (lower) than the average of the Moody’s and S&P ratings, and 0 otherwise. Same Third Rating is set to 1 if the Fitch rating matches the average of the Moody’s and S&P rating. For non-split-rated issues, a value of 1 for Same Third Rating indicates that the three rating agencies have the same rating. For split-rated issues, this dummy variable is 1 for two-notch splits where the Fitch rating is exactly between the two major ratings. The base case is bond issues without a Fitch rating.

Column 1 of Table 8 reports the regression results for the whole sample. The coefficients on the three Third Rating dummy variables are all negative, and the coefficient on High Third Rating is statistically significant. The three interaction terms are also all negative and two of them are significant. The negative and significant coefficient on the interaction term between Opacity Index and Same Third Rating is most interesting. This suggests that a Fitch rating, even if it is exactly the same as the average of the two other ratings, can reduce the yield premiums on information-opaque bond issues. When a rating agency rates a bond, it makes the alpha-numerical rating publicly available free of charge. In addition, it provides a detailed rating report to subscribers or to other investors for a one-time fee. The detailed rating reports from Fitch contain additional information priced by bond investors, even if the Fitch rating matches the two major ratings.

Column 2 of Table 8 reports the results of this model specification for the non-split-rated subsample. First, note that none of the three Third Rating dummy variables has a significant coefficient for the non-split-rated subsample, indicating that a Fitch rating, regardless of its level relative to the two major ratings, does not make a difference in yield spreads for non-split-rated bonds in general. Second, similar to the whole sample, two of the interaction terms are negative and significant, suggesting that the yield-reduction effect of a Fitch rating is mainly driven by information-opaque bond issues.

Column 3 of Table 8 examines the split-rated subsample. The coefficients on the High Third Rating and Same Third Rating dummy variables are negative and significant. Likewise, the interaction terms of the two dummy variables with Opacity Index have negative and significant coefficients.
In summary, Table 8 indicates that our main results are robust and not driven solely by split ratings or higher average Fitch ratings. Although a higher Fitch rating helps reduce yield spreads, particularly for split-rated bond issues, the yield-reduction effect of a Fitch rating is strong, especially for information-opaque issues, even when an additional Fitch rating does not increase the average rating on a bond issue.

Finally, as a robustness check, we rerun all the tests in Tables 7 and 8 with the Heckman (1979) two-stage correction and report the results in Tables B2 and B3 in Appendix B. The empirical results are generally stronger after the correction for potential selection bias.

### VI. Conclusion and Discussion

We examine the marginal effect of a Fitch rating on the yields of corporate bonds and find that Fitch ratings help significantly reduce bond yields. We show that the yield-reduction effect is not due to potential selection bias. Furthermore, the Fitch rating’s impact on
yield spread is particularly pronounced for information-opaque bond issues but relatively minor for information-transparent bond issues. On average, a Fitch rating reduces the information opacity premium by 30%, or 15 basis points for information-opaque bond issues. For an average bond issue in our sample, this translates into $5.8 million, or 1.275% of bond proceeds, which is much larger than the rating fees charged by Fitch, which range from $1,000 to $1,500,000. Although Fitch ratings, on average, are slightly higher than Moody’s and S&P ratings, the yield-reduction effect is not driven by issues with higher Fitch ratings. In the presence of information opacity problems, Fitch ratings reduce bond yields even when all three rating agencies give the same ratings or when Moody’s and S&P have a two-notch split and the Fitch rating is exactly in the middle.

We conclude that Fitch ratings in the corporate bond market add information that is valued and priced by the market when there is information opacity concerning the value of a firm’s debt securities. This conclusion is consistent with the research on stock analyst coverage. Many studies show that increasing the number of stock analysts makes stock prices more information efficient and that the effect of initiating new stock analyst coverage is more pronounced for relatively information-opaque firms and stocks.

The findings in this article support the argument that increased competition in the rating industry is beneficial to both investors and issuing firms. Furthermore, our findings indicate that the yield-reduction effect of a Fitch rating is not driven solely by regulations imposed on some bond buyers but is more broad-based and mainly the result of its additional information content. This finding suggests a solid economic justification for the existence of smaller rating agencies.

**Appendix A**

Suppose that the decision to acquire a third rating is determined by the following equations:

\[ Z^* = \gamma W_i + \mu_i \]

and

\[ \text{Third Rating} = \begin{cases} 1 & \text{if } Z^* > 0 \\ 0 & \text{otherwise} \end{cases} \]

(A1)

where \( Z^* \) is an unobserved variable representing an issuer’s utility in acquiring a Fitch rating. An issuer would acquire a Fitch rating if \( Z^* \) is greater than 0. \( W_i \) is a vector of the variables that determine the choice. \( \mu_i \) is an error term that reflects other choice determinants that are not captured in the model.

Assume that \( \mu_i \) is normally distributed with probability density function (pdf) \( \varphi(.) \) and cumulative density function (cdf) on \( \Phi(.) \), then

\[
E(\mu_i | \text{Third Rating} = 1) = E(\mu_i | \mu_i > (-\gamma w_i)) = \frac{\varphi(-\gamma w_i)}{1 - \Phi(-\gamma w_i)}
\]

(A2)

\[
E(\mu_i | \text{Third Rating} = 0) = E(\mu_i | \mu_i < (-\gamma w_i)) = \frac{-\varphi(-\gamma w_i)}{\Phi(-\gamma w_i)}.
\]
The right-hand terms in equation (A2) are called the Inverse Mills Ratio and they represent the private information revealed by the decision to acquire a third rating.

If the error term $\varepsilon$ in the bond yield spread regression in equation (2) and $\mu$ are correlated, or, in other words, there is selection bias, then

\[
E(\text{Yields Spread}|\text{Third Rating} = 1) = \beta'_S \mathbf{X} + E(\varepsilon|\text{Third Rating} = 1) \\
= \beta'_S \mathbf{X} + \rho \sigma_\mu \frac{\varphi(-\gamma w_i)}{1 - \Phi(-\gamma w_i)}
\]

(A3)

and

\[
E(\text{Yield Spread}|\text{Third Rating} = 0) = \beta'_S \mathbf{X} + E(\varepsilon|\text{Third Rating} = 0) \\
= \beta'_S \mathbf{X} + \rho \sigma_\mu \frac{-\varphi(-\gamma w_i)}{\Phi(-\gamma w_i)},
\]

(A4)

where $\rho$ is the correlation between $\varepsilon$ and $\mu$, and $\sigma_\mu$ is the standard deviation of $\mu$.

Hence, if there is selection bias, or $\rho$ is not zero, the OLS regression of equation (2) is misspecified because of the omitted variable, the Inverse Mills Ratio. To detect and correct for such selection bias, we use Heckman’s (1979) two-stage regression methodology. The first stage is a probit model of the issuing firm’s decision to acquire a Fitch rating as in equation (A1) and calculation of the Inverse Mills Ratio. The second stage adds the Inverse Mills Ratio to the yield spread regression as an additional explanatory variable.

The coefficient on the Inverse Mills Ratio is an unbiased estimate of $\rho \sigma_\mu$ in equations (A3) and (A4). If the coefficient is not significantly different from zero, then $\rho$ is zero, or there is no correlation between $\varepsilon$ and $\mu$. The sign of the coefficient indicates the direction of the possible bias. A negative sign indicates that $\varepsilon$ and $\mu$ are negatively correlated. A “surprising” Third Rating (or Third Rating with large $\mu$) is more likely to have a lower yield spread (small $\varepsilon$). In other words, a negative sign on the Inverse Mills Ratio indicates that issuing firms with inherently lower yield spreads are more likely to acquire a Fitch rating, resulting in an upward bias in the coefficient of Third Rating if the selection bias is ignored.

Conversely, a positive sign on the Inverse Mills Ratio indicates the opposite direction in selection bias; that is, issuing firms with inherently higher yield spreads are more likely to acquire a Fitch rating, resulting in a downward bias in the coefficient of Third Rating if the selection bias is ignored.

**Appendix B**

We build a probit model to investigate the issuing firm’s decision to acquire a Fitch rating. The dependent variable is set to 1 for bond issues with a Fitch rating, and 0 otherwise. We hypothesize that the issuing firm’s past relationship with the Fitch rating
agency, Fitch’s industry market share, as well as features and characteristics of the issuing firm and individual bond issues affect the decision to acquire a third rating.

As we argue in the text, an existing relationship with the Fitch rating agency is likely to increase the probability of acquiring a Fitch rating on new bond issues. Thus, we first include the Prior Fitch Rating dummy in the probit model. In addition, we hypothesize that Fitch Industry Market Share will be correlated with the decision to acquire a Fitch rating.

Because a third rating is probably more affordable for larger firms, we include Log of Firm Size in the probit model to control for firm size and expect the coefficient on the variable to be positive. Other issuing firm features in the probit model include ROA, Leverage Ratio, and Coverage Ratio. The effect of these variables on the choice of a third rating is an empirical question.

With regard to bond features, we include Log of Proceeds and Log of Maturity as explanatory variables. If a third rating helps reduce bond yields, bonds with larger issue sizes and longer maturities will benefit more from a third rating and, consequently, are more likely to have a third rating. Therefore, we expect the coefficients on these two variables to be positive. Given the findings in the literature that Fitch ratings reduce yields on bonds that have Moody’s and S&P ratings split between investment-grade and junk status (Bongaerts, Cremers, and Goetzmann 2012), we include a Border dummy variable, equal to 1 for bond issues where Moody’s and S&P ratings are split at the investment-grade border, and 0 otherwise, and expect the coefficient on this dummy variable to be positive. The probit model also includes a dummy variable for split ratings. Following Chen (2010), we create a dummy variable, Near Change, equal to 1 if the lower of Moody’s or S&P rating has a minus modifier, and 0 otherwise. A notch downgrade by the lower of the two ratings will push the bond issue into a lower letter category. Under some conditions, an additional rating from Fitch might mitigate the undesirable consequences of such downgrades.21 Thus, we expect such bond issues are more likely to acquire a third rating; consequently, the dummy variable will have a positive coefficient.

Because the descriptive statistics indicate that bonds with Fitch ratings have higher average Moody’s and S&P ratings, we include six letter rating dummy variables with AA as the base case to control for the effect of credit quality on the decision to acquire a third rating.

Finally, we include dummy variables to control for time and industry effects. As Fitch gained market share in the last several decades, we control for this factor by including a series of year dummies with 2014 as the base year. In addition, Becker and Milbourn (2011) find Fitch has larger market share in certain industries. To control for the industry effect, we create a series of industry dummies based on the issuing firm’s two-digit SIC code.

21 For example, suppose a bond has a Moody’s rating of Baa and an S&P rating of BBB−. If S&P downgrades it to BB+, the bond will be classified as a junk bond if the lower of the two major ratings is used for regulatory purposes. Conversely, if there are three ratings and the middle rating counts, a Fitch rating of BBB− or higher can maintain the investment-grade status of the bond, even when one of the two major ratings are downgraded below BBB−.
The results of the third rating selection model are reported in Table B1. Most of the coefficients have the expected signs and are significant. First, the coefficient on the Prior Fitch Rating indicator variable is positive and highly significant. Issuing firms with a Fitch rating on prior bond issues are about 50% more likely to obtain a Fitch rating on new bond issues. Second, the coefficient on Fitch Industry Market Share is positive and significant. These two findings support our use of them as instrument variables for the Third Rating dummy. Third, larger firms and larger bond issues are more likely to acquire a Fitch rating, as these firms can potentially benefit more from an additional rating. Fourth, bonds with split ratings, particularly two-notch split ratings from Moody’s and S&P, are significantly more likely to acquire a third opinion from Fitch. Finally, bonds rated at the investment-grade border are more likely to obtain a third rating from Fitch.

| TABLE B1. Third Rating Selection Model. |
|----------------------------------------|
|                                  | Coefficient | Marginal Effect |
| Intercept                        | –3.958 (.00) | 56.32%          |
| Prior Fitch Rating               | 1.536 (.00)  | 56.32%          |
| Fitch Industry Market Share      | 0.457 (.02)  | 18.18%          |
| Border                           | 0.881 (.00)  | 32.20%          |
| Near Change                      | 0.216 (.00)  | 8.59%           |
| One-Notch Split Rating           | 0.071 (.09)  | 2.84%           |
| Two-Notch Split Rating           | 0.192 (.01)  | 7.66%           |
| AAA                              | 0.639 (.00)  | 24.43%          |
| AA                               | Base case    | Base case       |
| A                                | 0.437 (.00)  | 17.28%          |
| BBB                              | 0.509 (.00)  | 20.08%          |
| BB                               | –0.019 (.87) | –0.01%          |
| B                                | –0.430 (.01) | –16.52%         |
| CCC                              | –0.796 (.02) | –27.93%         |
| Log of Firm Size                 | 0.081 (.00)  | 3.20%           |
| Leverage                         | 0.329 (.13)  | 13.11%          |
| ROA                              | 0.241 (.31)  | 9.58%           |
| Coverage                         | –0.001 (.08) | –0.04%          |
| Log of Proceeds                  | 0.191 (.00)  | 7.66%           |
| Log of Maturity                  | 0.028 (.35)  | 1.12%           |
| Year dummies                     | Yes          |                 |
| Industry dummies                 | Yes          |                 |
| No. of obs.                      | 6,655        |                 |
| Pseudo $R^2$                     | 0.38         |                 |

Note: This table reports the results of a probit model of the issuing firm’s choice to acquire a third rating. The dependent variable is a categorical variable, equal to 1 for issues with a Fitch rating, and 0 otherwise. Prior Fitch Rating equals 1 for bond issues whose issuer had a prior bond issue rated by Fitch, and 0 otherwise. Fitch Industry Market Share is defined as the percentage of bond issues in the one-digit Standard Industrial Classification (SIC) industry that are rated by Fitch in the previous calendar year. Border is a dummy variable equal to 1 if Moody’s and S&P are split at the investment-grade border, and 0 otherwise. Near Change is a dummy variable equal to 1 if the lower of Moody’s or S&P rating has a minus modifier, and 0 otherwise. One-Notch Split Rating (Two-Notch Split Rating) is a dummy variable set to 1 if the Moody’s and S&P ratings differ by one (two) notch(es), and 0 otherwise. The rating dummy variables are based on the Moody’s letter ratings, with AA-rated bonds as the base case. A series of industry dummies, based on the issuing firm’s two-digit SIC code, are included to control for industry effects. The regressions also include 14 year dummies, with 2014 as the base case. Other explanatory variables are defined in Table 1. The numbers in parentheses are p-values. The last column reports the marginal effect of each explanatory variable.
suggesting that firms do acquire a third rating out of concerns about the regulatory status of their bond issues.

Interestingly, bonds with below-investment-grade ratings are less likely to have a third rating relative to AA-rated bonds. Indeed, the coefficients on B and CCC ratings are negative and significant, indicating bonds in deep junk status have a lower probability of obtaining a Fitch rating. In addition, firms’ financial characteristics (i.e., profitability and leverage ratios) do not affect the decision to obtain a third rating from Fitch.

Table B2 reports the results of the Table 7 regression models with the Heckman (1979) two-stage correction for possible self-selection bias. Table B3 reports the results of Table 8 regression models with the Heckman two-stage correction for possible self-selection bias.

### TABLE B2. Impact of Third Ratings on Bond Yield Spreads: Heckman Two-Stage Correction Model.

|                  | Model 1     | Model 2     | Model 3     | Nonborder Subsample | Nonsplit Subsample | Split Subsample |
|------------------|-------------|-------------|-------------|---------------------|--------------------|-----------------|
| Intercept        | –153.91 (.00) | –168.08 (.00) | –176.06 (.00) | –155.05 (.00)     | –172.68 (.00)     | 206.39 (.00)    |
| Third Rating     | –19.91 (.00)  | –20.00 (.00)  | –19.50 (.00)  | –19.95 (.01)      | –18.79 (.03)      |                |
| Opacity Index    | 166.68 (.00)  | 163.39 (.00)  | 147.52 (.00)  | 190.51 (.00)      |                    |                |
| OL*Third Rating  | –55.37 (.00)  | –51.59 (.00)  | –48.21 (.02)  | –58.48 (.01)      |                    |                |
| Opacity Level    | 20.94 (.00)   | –1.68 (.80)   | –7.48 (.01)   | 28.09 (.00)       |                    |                |
| OI*Third Rating  | –55.37 (.00)  | –51.59 (.00)  | –48.21 (.02)  | –58.48 (.01)      |                    |                |
| Opaque Issue w/  | 8.76 (.02)    | 10.99 (.00)   | 11.89 (.00)   | 9.18 (.02)        | 13.01 (.00)       | 5.07 (.41)     |
| Third Rating     | –20.33 (.00)  | –20.33 (.00)  | –20.33 (.00)  | –20.33 (.00)      |                    |                |
| Transp. Issue w/| 1.68 (.80)    | 8.09 (.00)    | –7.48 (.01)   | –7.48 (.01)       |                    |                |
| Third Rating     | –20.33 (.00)  | –20.33 (.00)  | –20.33 (.00)  | –20.33 (.00)      |                    |                |

Note: This table reports the results of Table 7 regression models with the Heckman (1979) two-stage correction for possible self-selection bias. Only the coefficients on the test variables and the Inverse Mills Ratio are reported. The coefficients on control variables are similar to those in Table 7. The p-values (in parentheses) have been adjusted for potential clustering problems that might arise from multiple bond issues by the same firm.

### TABLE B3. Levels of Third Ratings and Bond Yield Spreads: Heckman Two-Stage Correction Model.

|                  | Whole Sample | Nonsplit Subsample | Split Rated Subsample |
|------------------|--------------|--------------------|-----------------------|
| Intercept        | –154.57 (.00) | –171.50 (.00)     | 208.43 (.00)          |
| High Third Rating| –23.00 (.00)  | –21.03 (.01)      | –19.28 (.04)          |
| Low Third Rating | –13.69 (.08)  | –18.62 (.10)      | –8.38 (.42)           |
| Same Third Rating| –17.08 (.01)  | –16.82 (.05)      | –30.62 (.02)          |
| Opacity Index    | 165.66 (.00)  | 146.04 (.00)      | 190.56 (.00)          |
| OI*High Third Rating| –56.64 (.01) | –69.12 (.02)     | –57.27 (.03)          |
| OI*Low Third Rating| –23.97 (.42) | –14.79 (.75)     | –34.86 (.36)          |
| OI*Same Third Rating| –64.91 (.00) | –42.60 (.07)    | –138.40 (.01)         |
| Inverse Mills Ratio| 8.23 (.03)   | 11.76 (.01)      | 3.63 (.56)            |

Note: This table reports the results of Table 8 regression models with the Heckman (1979) two-stage correction for possible self-selection bias. Only the coefficients on the test variables and the Inverse Mills Ratio are reported. The coefficients on the control variables are similar to those in Table 8. The p-values (in parentheses) have been adjusted for potential clustering problems that might arise from multiple bond issues by the same firm.
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