Did going public impair Moody's credit ratings?

Simi Kedia
Rutgers Business School
skedia@rbsmail.rutgers.edu

Shivaram Rajgopal*
Goizueta Business School
Emory University

Xing Zhou
Rutgers Business School
xingzhou@business.rutgers.edu

November 7, 2013

Abstract:

We investigate a prominent allegation in congressional hearings that Moody's loosened its standards for assigning credit ratings after it went public in the year 2000 in an attempt to chase market share and increase revenue. We exploit a difference-in-difference design by benchmarking Moody's ratings with those assigned by its rival S&P before and after 2000. Consistent with congressional allegations, we find that Moody's credit ratings for new and outstanding corporate bonds are significantly more favorable to issuers relative to S&P's after Moody's initial public offering (IPO) in 2000. The higher ratings assigned by Moody's after its IPO are more pronounced for clients that are large issuers of structured finance products and operate in the financial industry, consistent with testimonies that easier rating standards originated in the structured finance products group of Moody's. Moody's ratings are also more favorable for clients where Moody's is likely to face larger conflicts of interest: (i) large issuers; (ii) firms that are more likely to benefit from higher ratings, on the margin; and (iii) in industries with greater competition from Fitch. There is little evidence that Moody's higher ratings, post IPO, are more informative when accuracy is measured as expected default frequencies (EDFs) or as the likelihood of bond defaults. Our findings have implications for incentives created by a public offering for capital market gatekeepers and professional firms.

JEL classification: G32; L32

Key words: Credit ratings; Initial public offering (IPO); Moody's

---

We acknowledge financial assistance from our respective schools. We thank an anonymous referee, Bo Becker, Sam Bonsall, Jess Cornaggia, Serdar Dinc, Thaddeus Neururer, Jun Qian (discussant), Eddie Riedl, Jason Wei, and seminar participants at Boston University, the 6th Corporate Governance Conference at Drexel University, Washington University at St. Louis, SUNY Buffalo, National University of Singapore, Lehigh University, Indian School of Business (ISB), Indian Institute of Management (IIM) Bangalore, Seton Hall University, the SFS Cavalcade held at Miami University, City University of Hong Kong, Hong Kong University, HKUST, New York University and University of Michigan. All errors are ours alone.
*Corresponding author. Address: 1300 Clifton Road, Atlanta, GA 30322; Tel.: +1 404 727 9043; Email address: shivaram.rajgopal@emory.edu.

"Many former employees said that after the public listing, Moody's culture changed, it went "from [a culture] resembling a university academic department to one which values revenues at all costs," according to Eric Kolchinsky, a former managing director of Moody's" (The Financial Crisis Inquiry Report 2011, page 207).

1. Introduction

The recent financial crisis has spurred an active debate on why the major credit rating agencies failed to downgrade the ratings of structured finance products in a timely manner. Much of the academic debate has focused on the conflicts of interest inherent in the issuer-pay model followed by credit rating agencies.[1] However, relatively little attention has been devoted to the incentives created by the public or private ownership structure of the rating agencies. In this paper, we investigate whether the quality of credit ratings assigned by Moody's systematically declined after it went public in 2000.

Moody's was founded in 1900 to produce manuals of performance statistics related to stocks and bonds. The business was acquired by Dun & Bradstreet in 1962, and spun off as a separate company, organized as Moody's Corporation, on October 4, 2000. In congressional hearings investigating the culpability of the major credit rating agencies in the financial crisis of 2007, Moody's employees testified that the culture at the agency changed after it went public. They alleged that after its IPO, Moody's encouraged an environment where employees were asked to focus on revenues and market share such "that they looked the other way, trading the firm's reputation for short term profits" (The Financial Crisis Inquiry Report 2011, page 207).[2] Richard Michalek (2010), a former Moody's vice president and senior credit officer, testified to the Financial Crisis Inquiry Commission (FCIC): "the threat of losing business to a

[1] See for example, Mathis, McAndrews, and Rochet, 2009; Xia, 2010; Kraft, 2011; Bolton, Freixas, and Shapiro, 2012; Bonsall, 2012; Jiang, Stanford, and Xie, 2012; and Cornaggia and Cornaggia, 2013.

[2] Similar concerns were raised when Goldman Sachs went public. For instance, one partner was worried that "the public company could never replicate the close-knit culture of a partnership, where financial rewards are measured in lifetimes instead of months" (Kahn, 1998).

competitor, even if not realized, absolutely tilted the balance away from an independent arbiter of risk towards a captive facilitator of risk transfer."

We begin by comparing credit ratings on new corporate bonds that were rated by both Moody's and S&P. To study the impact of Moody's IPO on its credit ratings, we compare the difference in its ratings of corporate bonds before and after it went public in 2000. The period prior to Moody's going public ("pre-public period") spans 1995 to 1999, and the period after going public ("post-public period") extends from 2001 to 2005. To control for potential time based variation in corporate credit rating standards, and for changes in the nature of corporate bonds issued in the two periods, we employ a difference-in-difference methodology. In particular, we benchmark Moody's ratings for a common set of corporate bonds to those assigned by its closest rival, Standards & Poor (S&P). S&P did not experience any change in its ownership structure over this period, and has remained a private and fully owned subsidiary of McGraw Hill, a public company. We then evaluate whether relative to S&P, Moody's ratings, on average across all corporate bonds, were higher after Moody's IPO than before.

Although the FCIC was mainly concerned with Moody's push for market share in structured products, we study the impact of Moody's IPO on its corporate bond ratings. Employee testimonials reveal that a culture of catering to client needs started in the structured finance products group, and was transmitted to other products such as bonds. Such culture involved (i) compensation criteria that rewarded compliant analysts with promotions, bonuses and stock options; and (ii) reaching out to investment banking clients.

Studying corporate bonds has several advantages. First, most of the corporate bonds in the U.S. are rated by both Moody's and S&P. Hence, we can construct a sample of comparable securities with little selection bias. Second, corporate bonds are an established product line for rating agencies and they have a long time series of relevant data during both pre- and post-public periods. Finally, understanding agencies' standards for rating corporate bonds is important given the influence of bond credit ratings on a firm's cost of debt and capital structure (Graham and Harvey, 2001; Kisgen, 2006; Kisgen and Strahan, 2010). Although there are advantages to studying corporate bonds for the research question addressed in this paper,

in a supplementary test, we collect and analyze ratings for collateralized debt obligations (CDOs). In this data as well, we find evidence of relative laxity in Moody's ratings after its' IPO.

We obtain data on new corporate bond issues and their initial ratings by Moody's and S&P from the Mergent's Fixed Income Securities Database (FISD). For each new issue, we create a variable, *RatingDiff*, which is the S&P's numerical rating minus Moody's numerical rating for the bond issue. As more favorable ratings have smaller numerical values, a positive value of *RatingDiff* implies that Moody's assigned a more favorable rating than S&P for the new issue. The average value of *RatingDiff* for the 5,722 new bond issues in the pre-public period is -0.302. This implies that, prior to its IPO, Moody's, on average, assigned tougher ratings than S&P. The mean value of *RatingDiff* for the 2,783 new bond issues in the post-public period rises to 0.286, suggesting that in the post-IPO period Moody's reversed its conservative policy and assigned more favorable ratings than S&P. The change in these differenced ratings, of more than half a notch, before and after Moody's IPO, is statistically significant at the 1% level. The increase in relative rating of 0.588 notches can be translated into a 13 basis point reduction in yield. For investors, this increase in ratings implies a 10 basis points decrease in default rates, and a 5.5 basis points decrease in expected credit loss relative to those for an average bond issue.

The relative loosening of Moody's ratings is also observed for (i) median values of *RatingDiff*; (ii) both investment-grade and high-yield bonds; and (iii) after controlling for both issue and issuer specific characteristics. We go on to investigate whether the relative loosening of Moody's credit rating is attributable to Moody's laxity or to S&P's conservatism. We find no evidence of changes in the ratings assigned by S&P following Moody's IPO in 2000. Hence, the relative loosening of Moody's ratings is primarily attributable to an increase in Moody's ratings, rather than to a decrease in S&P's ratings.

To test whether the loosening of Moody's rating for corporate bonds originated in its structured finance products group, as alleged in the congressional hearings, we collect data on the issuers of structured products from the ABS database managed by J.P. Morgan's Asset Backed Alert. We find that Moody's rating is significantly more favorable, relative to S&P's, for corporate bonds of the large issuers of

structured finance products. After going public, Moody's is also relatively more favorable towards bond offerings by financial firms, who, as a group, are more likely to issue structured finance products.

The culture of catering to the needs of important clients likely permeated to other important corporate bond issuers, irrespective of their involvement in structured finance products. In particular, we find that large and frequent issuers of corporate bonds are likely to receive more favorable ratings from Moody's, relative to S&P, after its IPO in 2000. We also identify bonds whose credit ratings fall on the margin and can hence benefit from a higher rating from Moody's. Among all the bonds in any S&P rating class, the bonds at the top of the rating class are those issued by firms with the highest operating profits. Getting a higher rating from Moody's would benefit these issuers, and improve their relationship with Moody's. Hence, Moody's is more likely to cater to these clients by giving them a higher rating after its IPO. Consistent with this conjecture, we find that though prior to its IPO, Moody's was relatively tougher on these bond issuers, it tends to go easy on them after its IPO. In a similar vein, a public Moody's is likely to be relatively laxer when competitive pressures from other agencies are high. We identify industries that face the greatest competition from Fitch, in line with Becker and Milbourn (2011), and find that Moody's assigns relatively more favorable ratings to bonds in such industries.

Next, we extend the study of changes in Moody's ratings from new bond issues to all outstanding bonds that are rated. We find similar evidence of laxity in Moody's ratings relative to S&P after its IPO in 2000 for outstanding bonds. Furthermore, we find that such relative laxity in Moody's ratings for outstanding bonds after its IPO is significantly higher for bonds issued by (i) large structured products issuers, (ii) financial firms, (iii) large corporate bond issuers; (iv) firms that are on the margin, as described earlier, and (v) firms in industries that face greater competition from Fitch. In summary, after going public, Moody's tends to assign higher ratings than S&P for outstanding bonds as well.

The data thus far show that Moody's gives higher ratings relative to S&P after it went public in 2000. However, a skeptic could assert that Moody's favorable ratings could potentially be more informative about the bonds' eventual default. To assess this conjecture, we follow Duffie, Saita, and Wang (2007) and estimate the distance-to-default measure for each issuing firm in our sample based on the Black-Scholes-

Merton specification. We find little evidence that higher relative ratings of Moody's post IPO are accompanied by lower expected default frequency (EDF) or likelihood of bond defaults.

Another potential explanation for the results might arise from the difference in the rating philosophy of Moody's and S&P. Whereas S&P focuses on probability of default, Moody's explicitly accounts for recovery rate of debt. If recovery rates are higher following Moody's IPO, then these higher recovery rates might explain Moody's higher ratings relative to S&P's. However, we find no difference in recovery rates of defaulted bonds around Moody's IPO. We also examine whether the results could be due to Fitch's aggressive expansion after 2000 (See Becker and Milbourn (2011)). As relative easing of Moody's ratings after 2000 is also observed in industries that experienced the smallest changes in competition from Fitch over this period, competition from Fitch is unlikely to explain all the results.

Although we benchmark Moody's ratings to S&P's, we hasten to add that our paper does not say anything about absolute credit standards or about the absence of ratings related problems at S&P. The extant results are consistent with both Moody's and S&P assigning higher ratings to chase market share. Our emphasis is on Moody's tilt towards significantly higher ratings than S&P in the years after its IPO.

We perform several robustness tests. To address the role of the financial crisis, we extend our sample period to cover 1991-2009, excluding 2000. We also study a shorter time period, i.e., the one year before (1999) and after (2001) going public. Extending or shortening the sample does not qualitatively impact the results. We also benchmark Moody's ratings to those by Fitch's, instead of S&P, and find similar results. Further, our results are robust to the potential changes in the composition of firms and industries in the bond market. Our results continue to hold when we restrict the sample to firms that issue bonds in both the pre- and the post-public period, and when the model is estimated with industry-year fixed effects. Lastly, our results are robust to bias from potential correlations among bonds of the same issuers. We find similar results when we restrict the sample to include only one bond per firm in the pre- and the post-public period, and when the model is estimated with firm fixed effects. We also estimate the model in the cross section, both by year and by quarter. The estimated intercept is significantly lower for the years/quarters in the pre-public period relative to that for the post-public period.

Going public allows for sharper managerial incentives relative to being a division of a public listed firm. For a division of a public firm, the value of equity linked compensation is impacted by the performance of all the other divisions of that firm. In contrast, for a publicly listed credit rating agency, its stock price reflects its managers' actions more closely. Further, existing literature documents that the sensitivity of executive turnover to performance is higher for CEOs of focused, as opposed to diversified firms, and for CEOs relative to those for division heads.[3] This evidence suggests that the CEO of a public credit rating agency is likely to face greater market pressures than the head of the credit rating division of a public firm. Such sharper incentives and higher market pressures could potentially have achieved the opposite result, i.e., fostering the maintenance and strengthening of credit rating standards. However, as modeled by Holmstrom and Milgrom (1991), when agents are involved in multiple tasks, such as increasing market share along with maintaining credit rating standards as in the case of credit analysts, it may not be desirable to provide strong incentives as these can lead the agent to likely neglect the activity that cannot be effectively measured. As measuring revenues is easier than measuring adherence to credit rating standards or even default in the distant future, the availability of sharper incentives may have precipitated the high ratings at Moody's after it went public.

There is a large literature that examines the tradeoffs of going public. Whereas public firms face pressures to meet revenue and earnings targets that might engender negative behavior, going public also facilitates access to capital and growth, as discussed in more detail later. These tradeoffs imply that, depending on their characteristics, firms may optimally choose to either go public or stay private. The results in this paper suggest that for one of the two largest credit rating agencies, the decision to go public was associated with the easing of credit standards. This issue raises concerns due to the quasi- regulatory status of credit ratings. The regulatory capital requirement for banks and insurance companies varies with the credit ratings of the securities they hold. The explicit regulatory requirements around credit ratings

[3] See Berry, Bizjak, Lemmon and Naveen (2006) and Fee and Hadlock (2004).

imply that laxity arising from market pressures due to public ownership of rating agencies has the potential to impact the financial system and erode market confidence.

The paper contributes to the ongoing policy debate on the structure and supervision of credit rating agencies. One potential implication of our results is to acknowledge the quasi-regulatory nature of credit ratings and to increase regulatory oversight of credit rating agencies. Along these lines, in 2006, Congress passed the Credit Rating Agency Reform Act that required greater supervision by the SEC. Proposals espousing greater regulatory involvement have also been put forth by Senator Al Franken and the Bertelsmann Foundation.[4] A potentially alternate implication could be to remove or lower the emphasis on credit ratings in the regulatory framework. This can be achieved by including market based measures of risk, in addition to or in lieu of credit ratings, in determining the capital and investment requirements of regulated financial institutions.

In summary, our paper contributes to the literature by focusing on the potential impact of market pressures on the quality of Moody's credit ratings after its IPO. Our findings have implications for ownership structures of gatekeepers to financial markets, which have been traditionally organized as privately-held companies or partnerships to avoid potential conflicts between clients and public shareholders. Our results suggest that such conflicts are real and can potentially impact the independence of capital market gatekeepers. We acknowledge, however, that our setting consists of a single event study (Moody's IPO) and might have missed omitted variables that are relatively more important to Moody's than S&P. Future research on other capital market gatekeepers can shed further light on the issue.

[4] Senator Al. Franken's *Restore Integrity to Credit Rating Amendment* proposes setting up a board, overseen by the SEC, which will assign a credit rating agency to provide initial ratings in order to eliminate rating shopping and conflicts of interest. The Bertelsmann Foundation's "Blueprint for INCRA, An international Non-Profit Credit Rating Agency" available at http://www.bfna.org/publication/blueprint-for-incra-an-international-non-profit-credit-rating-agency proposes the creation of an international non-profit credit rating agency.

The remainder of the paper is organized as follows. Section 2 reviews the literature and Section 3 explains the research design. Section 4 reports the data and empirical analyses. Section 5 examines the changes in the informativeness of Moody's ratings and Section 6 discusses potential alternate explanations. Section 7 examines structured products. Section 8 reports several robustness tests and finally, Section 9 offers concluding remarks.

2. Literature review and employee testimonials

There is a large literature on the costs and benefits of public ownership. Several papers show that going public relaxes capital constraints and improves access to external capital. Saunders and Steffen (2011) study public and private firms in the UK and document that public firms face lower cost of external financing due to lower information asymmetry between insiders and outsiders. Pagano, Panetta and Zingales (1998) also find that public firms benefit from reduced borrowing costs. Gilje and Taillard (2012) show that lower cost of external financing leads to a greater responsiveness of public firms to investment opportunities. This literature suggests that a public Moody's was likely to have better access to future external financing though its IPO did not involve raising external capital.

The stated reason for Moody's IPO and spin-off was pressure on the parent, Dun and Bradstreet, to pursue focused strategies for its specific business. There is a large literature suggesting that diversified firms tend to subsidize and over invest in poorly performing divisions (see e.g., Lamont, 1997; Scharfstein and Stein, 2000; Rajan, Servaes, and Zingales, 2000). Stein (2002) models the investment decision in decentralized and hierarchical organizations and finds that capital allocation is likely to be more efficient in decentralized and focused firms if information about projects tends to be "soft." These studies point to the potential of increasing investment efficiency in the public and focused Moody's.

The literature suggests two reasons why going public might create incentives for the firm to deviate from the "first best" level of outcomes. First, going public necessarily splits ownership from management (Berle and Means, 1932; Jensen and Meckling, 1976), which, in turn, can create agency problems when the interests of the manager diverge from those of the owners. This conflict is also the basis of models of

"managerial myopia" such as that by Stein (1989), where the public-firm's manager makes decisions that deviate from "first best" if he has utility for the firm's short-run stock price. Graham, Harvey and Rajgopal (2005) find survey evidence that a majority of Chief Financial Officers (CFOs) would not be averse to giving up positive net present value projects to meet analyst-consensus estimates of quarterly earnings.[5]

Second, the liquidity associated with the stock's listing on public exchanges also makes it easier for concentrated shareholders to sell rather than hold, monitor and force value-increasing changes on management (Bhide, 1993). In contrast, owners of privately held firms usually have concentrated holdings which are inherently illiquid. These characteristics, on the margin, create incentives for owners in private firms to exercise better governance of the manager's actions. The liquidity effect can be compensated for if the public firm has large and active shareholders that have incentives to monitor. However, Moody's does not appear to have large shareholders that actively monitor its operations to mitigate the detrimental effect of market pressures.[6]

These tradeoffs in going public imply that firms, based on their individual characteristics, will choose to go public when it is associated with greater value. Though these tradeoffs in the decision to go public are valid for credit rating agencies, there are additional concerns that arise due to the unique position of rating agencies. In particular, the capital requirement for banks and insurance companies varies with the

[5] Also see Dechow and Sloan (1991), Bushee (1998), Skinner and Sloan (2002), Roychowdhury (2006), Bhojraj, Hribar, Picconi and McInnis (2009), Chapman and Steenburgh (2011) and Asker, Farre-Mensa and Ljungqvist (2012).

[6] The 2001 proxy statement lists two concentrated owners: (i) Harris Associates LP at 5.28% and (ii) Berkshire Hathaway at 14.98%. Berkshire Hathaway, though it owns a large stake, is known for a hands-off approach in managing its investees (Bowen et al. 2012). Consistent with this philosophy, Warren Buffett (2010) testified to the FCIC that he had no knowledge of how Moody's assigns ratings. Harris Associates LP's ownership stake drops below 5% in the subsequent quarter and continues to stay below 5%.

credit ratings of the securities they hold.[7] Further, along with insurance companies money market funds also face regulatory constraints on their investments in high-yield securities. These compliance requirements bestow on credit ratings a quasi-regulatory status with influence over the financing outcomes of firms and markets. We are not aware of prior work that specifically examines the impact of going public on credit rating agencies, though some insights can be obtained from the literature that investigates the ownership structure of other capital market gatekeepers.

2.1. Ownership status of other gatekeepers

Gatekeepers such as lawyers, accountants and finance professionals, who assist the company in raising public funds, are crucial to the smooth operation of capital markets. Most gatekeepers, such as auditors and lawyers, are organized as privately owned enterprises, possibly due to the potential conflicts of interest between the gatekeeper's clients and its shareholders. For instance, the prospectus of the first publicly traded law firm in the world, Slater and Gordon, listed on the Australian Stock Exchange in March 2007 includes the following caveat:

"Lawyers have a primary duty to the courts and a secondary duty to their clients. These duties are paramount given the nature of the company's business as an incorporated legal practice. There could be circumstances in which the lawyers of Slater & Gordon are required to act in accordance with these duties and contrary to other corporate responsibilities and against the interests of shareholders or the short-term profitability of the company."[8]

[7] Insurance companies are required to hold 0.4% capital for bonds rated A or above, 1.3% for BBB-rated bonds, and 4.6% and 10% for the holdings of BB-rated and B-rated bonds, respectively. Further, the National Association of Insurance Commissioners (NAIC) prescribes a hard cap of 20% for all non-investment-grade bonds as a percent of insurance companies' portfolio (See Ellul, Jotikasthira, and Lundblad (2011). For commercial banks, the Basel accord weighted the risk of AAA-rated securities at less than half the risk of ordinary commercial or mortgage loans, and thus required a proportionately lower capital reserve for them (See Acharya and Richardson (2009)).

[8] We could not find a similar caveat in Moody's prospectus or its 10-K right after it went public.

Debuse (2006) argues that outside, especially public, ownership of a law firm creates conflicts between clients and shareholders. In particular, it is hard to reconcile the key features of a "profession" such as autonomy, and ethical code of conduct with the pressures imposed by public ownership and a focus on profit maximization. In fact, the American Bar Association's House of Delegates objected to public ownership in the early 1980s because they were concerned that non-lawyers will interfere with lawyers' exercise of professional judgment. [9]

Adams and Matheson (1998) suggest that these arguments have no merit because a publicly owned law firm would succeed in the long term only by providing sound legal judgment to its clients. Because the firm's stock price would incorporate the public law firm's reputation, lawyers would have no incentive to allow profit considerations to interfere with their professional independence and judgment, especially when these lawyers are compensated via stock or stock options. They go on to point out that the pressure to maximize profits is already intense, even at privately held law firms.[10] Morrison and Wilhelm (2008) model the decision of investment banking partnerships to go public, and show that the decision depends on the trade-off between the bank's need for human and physical capital. This is consistent with the Slater and Gordon's stated reason for going public: "the need for (physical) capital investment."

Though this literature acknowledges the additional concerns that arise from a gatekeeper's decision to go public, there is virtually no empirical evidence on the impact, positive or negative, of the act of going public and the consequent stock market induced pressure on a gatekeeper's decisions. We address this important gap in the literature by studying the impact of Moody's IPO on its ratings.

2.2. Impact of going public on Moody's: employee testimonies

[9] Publicly owned law firms are legally prohibited in the United States.

[10] The trend of audit firms being organized as limited liability partnerships (LLPs) is related but not directly on point here. LLPs limit the liability of any one partner, but continue to suffer from the same limits on raising capital as a traditional partnership.

Prior to its IPO, Moody's was associated with notions of integrity, commitment, and expertise. At the FCIC hearings, one of the analysts described the corporate culture at Moody's before going public as follows: "Moody's analysts were proud to work for what they believed was by far the best of the rating agencies. They viewed Moody's competitors as a distant second in quality and ratings integrity" (Froeba, 2010). A 1994 article in Treasury and Risk Management magazine titled "Why Everyone Hates Moody's" concluded that "ingrained in Moody's corporate culture is a conviction that too close a relationship with issuers is damaging to the integrity of the ratings process" (McLean and Nocera, 2010, page 114).

However, the culture at Moody's allegedly changed after it went public in 2000, with the focus shifting to improving revenues and market share in an effort to increase Moody's stock price. Froeba (2010) testified that "as long as market share and revenue were at issue, Moody's best answer could never be much better than its competitors' worst answers."[11] The *Wall Street Journal* (April 11, 2008) discusses an anecdote where Brian Clarkson, a managing director, quadrupled Moody's market share in the residential mortgage backed securities group by simply firing (or transferring) nearly all the analysts in the group, and replacing them with analysts willing to apply a new, potentially laxer, rating methodology. Mclean and Nocera (2010, page 116) report that the rapid promotions of Brian Clarkson signaled that the culture advocated by the structured finance side had won. Bond analysts, even in the pre-IPO days, regularly faced pressure to issue favorable ratings, but Moody's had always backed them when they resisted. After Clarkson's ascension, the corporate bond side was likely unable to resist the pressure to be favorable to

[11] A skeptic can ask why Moody's would sacrifice its reputation to maximize short term revenue. Partnoy (1999) offers the regulatory license view as a counter to the reputational capital view for the enduring existence of rating agencies accredited by the SEC. He argues that Moody's and S&P have survived and prospered for so long not because ratings are necessarily informative, accurate or credible, but because ratings enable issuers to reduce the costs of complying with costly regulation whereby money market funds, insurance companies and banks have to hold securities rated highly by credit ratings or face punitive compliance costs.

issuers. This would be especially pertinent if the issuers were large players in the structured products and whose business Moody's was trying to win.

Testimonials suggest that this change in culture and a sharper focus on the share price was achieved through compensation and promotion plans. Before going public, Moody's executives were covered under the D&B executive compensation plan which remained in effect through December 31, 2000. Under this plan, performance share awards/ stock option payments were based upon the achievement of two year cumulative revenue targets. Subsequent to its IPO, Moody's benchmarks for the evaluation of executive performance for years 2001 and 2002 were based on growth in earnings per share, revenue and operating profits.[12]

Further, the beneficial ownership of Moody's executives also increased significantly in the years after going public. John Rutherford's, the CEO of Moody's when it went public, ownership increased from 178,266 shares in December 2000 to 396,303 shares in December 2002. Similarly, Raymond McDaniel's, head of global ratings at the time of going public, ownership increased from 74,169 shares in December 2000 to 193,070 shares in 2002. This increase in equity ownership, potentially the result of minimum stock ownership guidelines adopted by the firm in 1999, implies that executive wealth was significantly more sensitive to the Moody's share price.

Though the compensation criteria weighted stock price more and executive ownership increased substantially, there is little evidence to suggest that Moody's awarded significantly more stock options as a fraction of salary after it went public.[13] Though there is no discernible increase in the propensity of stock

[12] Source: Moody's proxy statements for the years 2000, 2001, 2002 and 2003.

[13] There is scant data on what Moody's employees were paid prior to its IPO in 2000. The available data points to little change in the fraction of equity linked compensation. Stock options grants amounted to 2.2% of shares outstanding in 1999 for Dun and Bradstreet. In 2000, option grants did increase to 3.6% of shares outstanding at Moody's but this was due to accelerated grants at the time of the IPO. Because of such accelerated grants, no options were granted in the year 2001. Option grants returned to 2.4% of total shares outstanding in 2002. This pattern is

option usage, management had discretion in awarding these options to lower level analysts. As per employee testimonies, such discretion in option awards, along with the lure of promotion and threat of dismissal, was effectively used by management to penalize non-complaint analysts. Specifically, as per Mark Froeba's testimony (June 2, 2010 before the FCIC), compliant analysts were rewarded with good reviews, promotions, higher pay, bigger bonuses, better grants of stock options and restricted stock. Uncooperative analysts got poor performance evaluations, no promotions, no raises (or effective pay cuts), smaller bonuses and fewer grants of stock options and restricted stock.

At the same time, Moody's tried to reach out to its investment banker clients. Froeba (2010) testified that "investment banks had learned that Moody's would allow them to ask that all of the bank's deals be assigned to the same particularly 'flexible' analyst or team of analysts." They had also learned that they could go over the heads of analysts (even of rating committees despite Moody's policies to the contrary) if they should ever really need to do so by appealing directly to Moody's managers and senior managers."

Other employees have alleged that Moody's under-invested in compliance related activities after the IPO. Scott McCleskey, a former chief compliance officer testified: "so Brian Clarkson comes up to me, in front of everybody at the table, including board members, and says literally, 'How much revenue did Compliance bring in this quarter? Nothing. Nothing.' For him, it was all about revenue" (Financial Crisis Inquiry Report 2011, page 208).

Top officers at Moody's have denied the significant influence of the IPO. Moody's CEO, Raymond McDaniel, testified that he didn't see "any particular difference in culture" after the IPO (Financial Crisis Inquiry Report 2011, page 207). Brian Clarkson explained that Moody's cares about business, but the quality of ratings matters even more: "I think that Moody's has always been focused on business… but

---

also reflected in the compensation of two senior executives. John Rutherford received 46.7%, 76%, 0% and 40% of total compensation in stock options over the years 1999 to 2002 respectively. Similarly, Raymond McDaniel got 26.7%, 77.5%, 0% and 46% of his total compensation in stock options over the years 1999 to 2002 respectively.

ratings quality, getting the ratings to the best possible predictive content, predictive status, is paramount." He blamed unforeseen conditions in the housing market: "we believed that our ratings were our best opinion at the time that we assigned them. As we obtained new information and were able to update our judgments based on the new information and the trends we were seeing in the housing market, we made what I think are appropriate changes to our ratings" (Financial Crisis Inquiry Report 2011, page 208).

However, evaluating employees on the quality of ratings is difficult in real time as the predictive ability of a rating can take years to validate. Hence, it is not surprising that increased market pressures arising from Moody's public listing implied that a greater emphasis was placed on revenue and market share that are more easily measured. This is consistent with the predictions of the Holmstrom and Milgrom (1991) model discussed in the introduction.

3. Research design

To explore whether Moody's standards for assigning credit ratings loosened following its IPO in 2000, we begin by analyzing the difference in its ratings of new corporate bond issues during the pre- and the post-public periods. Merely comparing Moody's ratings before and after its IPO is subject to obvious criticisms that such changes may capture overall trends in the rating industry. Overall trends in the rating industry involve the impact of Regulation FD (Liu, Jorion and Shi (2006)), structural shift in 2002 towards more stringent ratings (Alp, 2013), easing of ratings during booms (Bolton, Freixas, and Shapiro, 2012)), increased competition from Fitch (Becker and Milbourn, 2011) and career concerns of analysts leaving to join issuing firms (Cornaggia, Cornaggia, and Xia, 2012).

Moreover, the pressure to increase market share in structured products was likely felt by all rating agencies and not just Moody's. Specifically, the drive for market share was also emphasized at S&P, Moody's primary competitor (Permanent Subcommittee on Investigations 2011). One former S&P Managing Director testified: "by 2004 the structured finance department at S&P was a major source of revenue and profit for the parent company, McGraw-Hill. Focus was directed at collecting market share and revenue data on a monthly basis from the various structured finance rating groups and forwarded to the

finance staff at S&P" (Permanent Subcommittee on Investigations 2011, page 276). The hearings produced emails where S&P's executives discuss easing rating criteria to gain market share and respond to pressures from investment banks. Indeed, the Justice Department sued S&P on February 4, 2013 on the grounds that the agency ignored its own standards in rating mortgage bonds that imploded in the financial crisis. Therefore, an alternate hypothesis is that S&P, Moody's chief competitor, was equally susceptible to maximizing short term profits and to investment banker pressure. That is, the act of Moody's going public, per se, did not affect ratings quality.

To address these concerns, we employ a difference-in-difference methodology by benchmarking Moody's rating of a bond to that assigned by S&P. Specifically, we estimate the difference in the initial ratings provided by both Moody's and S&P for new bond issues, and examine how such difference in ratings changes around the time when Moody's went public.

S&P serves as an ideal benchmark for Moody's. S&P was formed in 1941 from the merger of H.W. Poor Co. and the Standard Statistics Bureau. In 1966, it was acquired by The McGraw-Hill Companies and has been a fully owned division of McGraw Hill ever since. S&P has been the closest competitor of Moody's. Based on the number of outstanding ratings, Moody's and S&P are the two largest Nationally Recognized Statistical Rating Organizations (NRSROs) designated by the Securities and Exchange Commission (SEC).[14] Furthermore, as S&P's ownership status did not change over our sample period, any change in S&P's ratings does not reflect market pressures potentially faced by Moody's after it went public.[15] Difference-in-difference methodology has also been used by Jiang, Stanford, and Xie (2012)

[14] For the year 2010, Moody's and S&P have approximately 1 million and 1.2 million ratings reported outstanding, respectively. These magnitudes far exceed those of the third largest rating agency, Fitch, with approximately 500,000 ratings reported outstanding (see SEC 2011).

[15] McGraw Hill announced several minor divestitures over this period. These included the sale of the healthcare information group, its juvenile retail publishing unit in 2004, S&P Comstock for $115 million in 2003, MMS International and JJ Kenny Drake Brokerage in 2002, DRI in 2001, and the Tower group in 2000. The minor nature

to examine the impact of issuer-pays model. Note that the research design does not imply that Moody's credit ratings have declined or improved on an absolute scale. Rather, the interpretation is whether relative to the S&P, Moody's ratings became more favorable to issuers after it went public. [16]

The difference-in-difference methodology has the advantage of controlling for underlying factors that affect credit rating agencies in a similar way. We attempt to identify and control for remaining factors that are likely to have a differential impact on the rating agencies. Bertrand, Duflo and Mullainathan (2004) point out that difference-in-difference tests that rely on many years of data generate biased standard errors due to serial correlation. To address this issue, we use one of the suggestions made by Bertrand, Duflo and Mullainathan's (2004) and ignore the time series to just examine one year before and one year after Moody's IPO. These results are discussed in Section 8 and do not impact our reported inferences.

The second aspect of our research design is the focus on the credit rating of corporate bonds rather than that of structured products. As discussed before, studying corporate bonds has several advantages. Along with the advantages listed earlier, it should be noted that the risk assessment models for corporate bonds are relatively established, unlike those for structured finance products. Hence, it becomes harder to argue that any differences in ratings between Moody's and S&P are attributable to (i) differential learning, by the agencies, about the nature of the financial products; or to (ii) important innovations in the structuring and delivery of such products. As Kroezner and Shiller (2011, page 59) assert, corporate bonds are less opaque than structured finance products because there is a substantial amount of public information

---

of these can be inferred as the terms of sale were not publicly disclosed. However, even after these divestitures, the financial segment accounted for $2.4billion in revenue relative to the $6 billion in McGraw Hill's total revenue (10-K, 2005). The financial segment includes the rating business along with others like S&P's indices and Capital IQ.

[16] The Department of Justice sued S&P on February 4, 2013 alleging that the rating agency ignored its own standard in rating mortgage bonds over the years 2004 to 2007. Several press articles suggest that Moody's is also under investigation by the Department of Justice (see for e.g., a Wall Street Journal article published on April 7th, 2013 available at http://online.wsj.com/article/SB10001424127887323550604578408823708827896.html).

available about corporate debt. Consequently, the "information advantage" that a credit rating agency might have compared to an industry analyst in rating a corporate bond, relative to a structured finance product, is not great. This reduces Moody's opportunity to rate bonds favorably and makes it harder for us to potentially detect the effect of the IPO on its ratings of corporate bonds. Though structured products are subject to the caveats stated above, we collect and examine data on CDOs over the period 1997 to 2003 in Section 7 for completeness.

A potential concern with the research design is the timing of the IPO. Did the decision to spin off Moody's reflect changing unobserved underlying forces in the credit rating business? This does not appear to be the case for two reasons. First, if this hypothesis were true, such underlying forces in the credit rating business should have been equally felt by S&P. Hence, we should have seen a similar attempt by S&P to go public, and difference in difference estimation should have accounted for such underlying forces. Second, the decision to spin off Moody's is one in a series of spin offs conducted by its parent, Dun and Bradstreet (D&B), as part of an overall corporate restructuring plan. Specifically, prior to Moody's IPO, D&B had spun off A. C. Nielson, the market research firm and Cognizant Corporation, the technology consultancy, in 1996. In 1998, D&B spun off R.H Donnelley, a yellow pages advertiser. D&B cites continuing pressure from institutional investors to increase shareholder value by becoming a more focused firm as a significant driver of the Moody's IPO (Gilpin, 1999). Further, the IPO was structured as a spin-off of Moody's shares to existing D&B shareholders. Hence, it did not involve raising funds that might have substantially altered Moody's investment and capital expenditures.

Another potential concern is whether going public was associated with a change in senior leadership at Moody's. If that were true, the change in Moody's culture could possibly be attributable to the new leadership rather than to the act of going public. However, this does not appear to be the case. John Rutherford Jr., the CEO of Moody's from the time it went public till April 2005, served as the chief

administrative officer and managing director at Moody's from 1996 to 2000.[17] Raymond W. McDaniel, the senior vice president of the Global Ratings division when Moody's went public, had been with the agency since 1996 and succeeded John Rutherford Jr. as CEO in 2005.

4. Data and results

We obtain data on bond characteristics, such as issue size, offering date, and maturity date, as well as the history of credit rating changes by Moody's and S&P from the Mergent's Fixed Income Securities Database (FISD). We begin by studying new bond issues during the pre- and the post-public periods. In particular, we examine the potential differences between the initial credit ratings assigned by Moody's and S&P for each new bond issue. For all firms covered by both CRSP and Compustat, we retrieve the list of new bond issues rated by both Moody's and S&P from 1995 to 2005 but excluding 2000.[18] This process results in a sample of 30,484 bonds issued by 903 unique firms. However, a substantial fraction of these new bond issues was made by Freddie Mac and Fannie Mae, and almost all these bonds received an AAA rating from both rating agencies. Eliminating these government agency bonds reduces our sample to 8,505 new bond issues by 901 firms.[19]

[17] According to Moody's Proxy filings Mr. John Rutherford Jr. was employed by Dun and Bradstreet since 1985. Clifford L. Alexander, a director of Dun & Bradstreet since 1993, was the Interim CEO and Chairman of the board from October 1999 to October 2000. He continued to serve as the Non-Executive Chairman of the board till 2003.

[18] FISD assigns a unique Issuer ID to each issuing firm. For each Issuer ID, we first identify the list of associated unique 6-digit issuer CUSIPs. We then match the CRSP and Compustat information to all bonds with the same Issuer ID as long as one of the Issuer ID's 6-digit CUSIP for a firm is covered in CRSP and Compustat at the time of issuance. Further, we exclude bonds where the initial rating by Moody's and S&P are different by four or more notches. This mismatch is most likely attributable to errors and accounts for less than 1% of the bond issues.

[19] The results continue to hold when we include bonds issued by Freddie Mac and Fannie Mae. These results have not been reported for brevity, but are available upon request.

Table 1, Panel A presents the credit rating categories used by Moody's, the equivalent ratings by S&P, and the distribution of our sample new issues across these categories. There are a total of 21 rating categories for both Moody's and S&P. For ease of comparison, a numeric value is assigned to each notch of Moody's credit rating, with 1, 2, 3, 4, … denoting Aaa, Aa1, Aa2, Aa3, …, respectively. Note that more favorable ratings have smaller numerical values. We find that a substantial fraction of the new issues are investment-grade. There are very few new issues in the highest or lowest credit quality rating. The median rating by both Moody's and S&P is six (Panel B). Table 2 reports that the mean (median) issue size is $141 million ($50 million), and the average time to maturity is about eight years. Not surprisingly, firms issuing debt are large, as the average issuer's market value is $94 billion, though the median issuer's market value is much smaller at $39 billion.

4.1. Univariate analysis

To study the difference in the initial ratings assigned by Moody's and S&P for new issues, we create the variable *RatingDiff*, which is the numerical value of the S&P rating minus the numerical value of the Moody's rating for the same bond issue. As favorable ratings are coded as smaller values, a positive value of *RatingDiff* means that Moody's rating for the new issue was better relative to S&P.

As seen in Table 3, in the pre-public period, there were 5,722 new issues with a mean *RatingDiff* of -0.302. The negative number implies that Moody's assigned, on average, a tougher credit rating than S&P in the five years prior to going public. The average *RatingDiff* in the post-public period, however, is 0.286, implying that in the five years following its IPO, Moody's, on average, assigned a higher credit rating relative to S&P. The move from -0.302 in the pre-public period to the 0.286 in the post-public period is statistically significant at the 1% level. In sum, Moody's was significantly more likely to assign a higher rating relative to S&P in the years after its IPO.

We also examine how *RatingDiff* changes over the individual years around Moody's IPO. Figure 1 shows that the average value of *RatingDiff* was consistently negative in the pre-public period of 1995 to 1999. After the IPO in 2000, the average *RatingDiff* approaches zero in 2001 and becomes progressively

more positive in 2002 and in the years after that. The size of the change from 1999 to 2001 suggests a discernible shift in the conservative culture of Moody's after its IPO.

To ensure that the results are not driven by a few extreme observations, we also examine the median values of *RatingDiff*. Although the median of *RatingDiff* is zero for both periods, the distribution of *RatingDiff* moves significantly towards the positive end, or towards higher ratings by Moody's after its IPO. Further, Moody's relatively looser standards post-IPO are apparent across the board, i.e., for investment-grade, high-yield and split ratings. For the subsample of bonds with split ratings, Moody's is tougher than S&P both before and after the IPO, though it is relatively less tough after the IPO.

4.2. Multivariate analysis

The univariate tests yield significant evidence consistent with congressional allegations. In this section, we verify whether these results hold in a multivariate set up. To capture the impact of the IPO on *RatingDiff*, we create an indicator variable, *post2000Dum*, that takes the value of one for all bonds issued after 2000, i.e., in the post-public period, and zero otherwise. We then regress *RatingDiff* on *post2000Dum*. If Moody's loosened its standards for assigning credit ratings following its IPO, the coefficient of *post2000Dum* should be positive and significant.

In addition, we control for a host of issuer and bond characteristics in line with those employed by prior work (Pinches and Mingo, 1973; Kaplan and Urwitz, 1979; Blume, Lim, and Mckinlay, 1998; Campbell and Taskler, 2003; Jiang, Stanford, and Xie, 2012). Specifically, we include variables pertaining to the issuing firm: (i) the firm's size using the logarithm of the sum of market value of equity and book value of debt (*IssuerSize*), (ii) leverage which is the ratio of long-term debt to total assets (*Leverage*); (iii) firm performance using the ratio of operating performance before depreciation to sales (*OpMargin*); and (iv) firm volatility as measured by the standard deviation of stock returns (*Stkretstd*). All accounting variables are of annual frequency and are drawn from the fiscal year prior to the issuance of the new bond, and issuer volatility is estimated from daily stock returns in the year prior to the new issue. We also include bond specific variables: (i) the logarithm of the par value of the bond issue (*IssueSize*), (ii) the number of

years to maturity (*YTM*), and (iii) a dummy variable for whether the issue is senior debt (*SeniorDum*). It is likely that Moody's rating models for issuers or bonds with specific characteristics changes after its IPO, relative to S&P's model. To control for this potential confound, we include interactions of all the control variables with *post2000Dum* to estimate the following:[20]

$$RatingDiff_i = \gamma_0 + \gamma_1 post2000dum_i + \sum_{j=2}^{8} ControlVar_i^j + \sum_{j=2}^{8} ControlVar_i^j * post2000dum_i + \varepsilon_i, \quad (1)$$

As shown in Column I of Table 4, the coefficient on *post2000Dum* is 0.585 and is significant at the 1% level. This result suggests that, subsequent to its IPO, Moody's ratings get better by more than half a rating notch. Our results are qualitatively unchanged in Column II where we include all the control variables. The coefficient on *post2000Dum* is positive and significant at the 1% level, and the magnitude is higher at 0.851. This relative easing in Moody's ratings is also economically meaningful. An increase in relative rating of 0.851 (0.588) notches, estimated by the multivariate (univariate) analysis, implies a reduction of 19 (13) basis points in yield for the issuing firm.[21] As the average bond issue size after Moody's IPO was 200 million, this implies annual interest saving of $380,000 ($260,000) per bond.

Based on the historical average default rates obtained from the Moody's 2007 Annual Report on Corporate Defaults and Recovery Rates, the increase in rating by 0.851 (0.588) from the median rating of

[20] Consistent with Jiang, Stanford and Xie (2012), we demean the control variables. Specifically, we include each control variable's deviation from the annual sample average when estimating the model.

[21] The average yield spread for A2 rated bonds (sample median) is 4.78%, which is 22 basis points higher than that for A1 rated bonds. Higher Moody's rating of 0.851 notches implies a reduction of 19 basis points in spread. The yield spread data are obtained from FISD. Bonds which are convertible, callable, or putable are excluded while calculating the average yield for different rating categories.

A2 implies a reduction in default rate of 14 (10) basis points.[22] We also estimate the implications of better ratings for expected credit losses. Following Moody's methodology, we calculate expected credit loss as the product of the probability of default and the loss given default. The increase in Moody's ratings by 0.851 (0.588) notch implies a reduction in credit losses of 8 (5.5) basis points.[23]

With respect to the control variables, Moody's is relatively tougher on firms with higher operating margins and those with high stock volatility. Relative to S&P, Moody's weighs bond characteristics differently as well. Moody's assigns higher ratings to bond issues that are larger and have a shorter maturity span but is tougher on senior issues. This tendency is partly reversed in the post-public period. Overall, the results suggest that Moody's model for assessing credit quality based on bond and issuer characteristics significantly changes after its IPO. More important, controlling for this potential change in their credit rating process does not impact the coefficient on *post2000Dum*. In summary, the multivariate evidence supports the findings of the univariate tests that Moody's assigns relatively higher ratings for new bond issues in the years after its IPO.

To explore the causes of the relatively higher ratings by Moody's after its IPO, and to shed some light on individual rating agencies, we examine ratings assigned by each agency separately. In Column IV of Table 4, we re-estimate Model (1) using Moody's ratings, instead of *RatingDiff*, as the dependent variable. The coefficient of *post2000Dum* is negative (-0.935) and significant at the 1% level, suggesting

[22] The historical average default rates from Moody's 2007 Report for A2 and A1 rated bonds are 0.762% and 0.596%. These default rates are for a 7-year bond for the period 1983-2006. An increase in Moody's ratings of 0.851 notches therefore implies a reduction in default rate of 0.14%.

[23] We use historical average default rates used above for the probability of default. Loss given default is equal to (1-recovery rate). We use a recovery rate of 47.7% till 1999 and 49% subsequently (See Table 9). For A2 rated bonds, expected credit loss is 39.8 basis points (0.762% * (1-47.7%)). For A1 rated bonds, expected credit loss is 30.4 basis points. An increase in Moody's credit rating by 0.851 (0.588) notches implies a reduction in credit losses of 8 (5.5) basis points.

that Moody's assigns more favorable ratings after its IPO in 2000. However, when we examine the ratings assigned by S&P (Column V), we find the coefficient of *post2000Dum* to be -0.084, which is not statistically significant. These results indicate that the increase in *RatingDiff* following Moody's IPO appears to be driven by higher ratings from Moody's and not from stricter ratings assigned by S&P.

4.3. Cross sectional results

The results thus far document a relative loosening of rating standards at Moody's after it went public in 2000. As discussed earlier, this was likely caused by a move to a client centric culture that started in the structured products group. If the culture of laxity in ratings was directed towards winning market share in structured products, then the post-IPO laxity in ratings should be stronger for bond issuers that issue the most structured products. Catering to these clients by giving them a higher rating in their corporate bond issues will increase the likelihood of securing their rating business for structured products. To examine this conjecture, we obtain information on the issuance of structured products, including asset-backed securities (ABS), mortgage-backed securities (MBS), and collateralized debt obligations (CDOs), for 1995 through 2005 from the ABS database managed by J.P. Morgan's Asset Backed Alert. The total issuance of these structured products increased from $142 billion in 1995 to $1,605 billion in 2005 (See Table 5). We manually link the names of bond issuers in our sample with those in the ABS database. The top 40 issuers of structured products in every year, accounting for an average of 69.2% of total issuance, are classified as large structured product issuers.

We then estimate the following model:

$$RatingDiff_i = \gamma_0 + \gamma_1 post2000dum_i + \gamma_2 HighConfDum_i + \gamma_3 HighConfDum_i * post2000dum_i + \sum_{j=4}^{10} ControlVar_i^j + \sum_{j=4}^{10} ControlVar_i^j * post2000dum_i + \varepsilon_i, \quad (2)$$

where all control variables from Model (1) are included in estimation. The variable *HighConfDum* is an indicator variable that captures bond issues with high conflicts of interest. It takes the value of one for corporate bond issues by firms that are identified as large structured products issuers in the prior year. The interaction of *HighConfDum* with *post2000dum* captures the relative loosening in Moody's ratings for large

structured products issuers, after Moody's IPO in 2000. Partial results of the estimation are displayed in Column I of Table 6. The coefficient on the interaction of *HighConfDum* with *post2000dum* is positive and highly significant. After going public in 2000, Moody's assigned relatively better ratings to corporate bond issues of large structured products issuers. The coefficient on *HighConfDum* is not significant, suggesting that Moody's ratings of corporate bonds issued by large structured products issuers were not different from S&P's before Moody's went public. The coefficient on *post2000dum* continues to be positive and significant as before. In summary, Moody's gave relatively better ratings for new bond issues by large structured products issuers after going public in 2000.

As most structured products are issued by financial firms, we use industry classifications to create another proxy for large issuers of structured products. A firm is classified as a financial firm if it operates in banking, credit/financing, real estate, and savings & loans.[24] In this specification (Column II of Table 6), the *HighConfDum* variable takes the value of one if the bond is issued by a financial firm. The coefficient on *HighConfDum* is positive and significant implying that Moody's gave better ratings than S&P for issues by financial firms. However, after going public, this tilt towards financial firms significantly increased – the coefficient on the interaction of *post2000dum* and *HighConfDum* is positive and significant.

Next, we study whether the culture of catering to clients spread to ratings of large corporate bond issuers, irrespective of their connection to structured products. Specifically, after its IPO in 2000, Moody's management had greater incentives to keep the large and frequent issuers of bonds satisfied as they accounted for a significant fraction of its current and future business.[25] Large issuers are identified based

[24] Information on a bond's industry classification is provided by Mergent's FISD. Industries identified as financial services, insurance, and leasing have not been included in financial firms' classification. We tried different variations of financial firm classification such as including only firms in banking and obtained very similar results.

[25] According to the 2008 Report of the "Autorité des marchés financiers" on credit rating agencies (see page 15), fees paid by issuers accounted for 80% of Moody's revenues in 2007. For McGraw-Hill, which is Standard & Poor's parent company, the analogous measure was 33%.

on issue size and frequency of issue. This empirical filter has the added advantage of capturing Moody's payment model which includes both a fixed payment for a bond issue and a variable fee based on the size of the bond issue. A bond issue is classified as large if it is greater than the median size of all bond issues in the past three years. An issuer is classified as large if the par value of all bonds issued in the last three years is above the median for the sample. The indicator variable *HighConfDum* takes the value of one for a large bond issue by a large issuer and zero otherwise. As shown in Column III of Table 6, the coefficient on the interaction of *HighConfDum* with *post2000Dum* is positive and significant, and the coefficient on *HighConfDum* is negative and significant. Before its IPO, Moody's was relatively tough on these large issuers, but became significantly more favorable towards them after going public in 2000. The coefficient on *post2000Dum* continues to be positive and significant. In summary, though the relative loosening of Moody's ratings after going public is seen for all new issues, it is significantly higher for new large issues of large issuers.[26]

We also identify bond issues that are on the margin and could benefit from a higher rating. Bongaerts, Cremers and Goetzmann (2012) document that firms with lower ratings often shop for higher ratings from other agencies to serve as a tiebreaker. Specifically, among all issuers in any S&P rating class, those with the highest operating profits are most likely to qualify for a higher rating relative to the one assigned to them by S&P.[27] Obtaining a higher rating from Moody's, a competitor, is likely to make a substantial difference to these issuers and is also likely to translate into a better relationship between

[26] Another potential cross-sectional test would be to examine solicited and unsolicited ratings. Unsolicited ratings, i.e., ratings that are not paid by the issuer do not have revenue considerations and hence should not experience any relative favorable treatment from Moody's after its IPO. Unfortunately, we do not have data to identify which ratings are unsolicited.

[27] The test is motivated by Jiang, Stanford and Xie (2012). Consistent with their methodology, we use the issuers' operating income before depreciation scaled by sales in the year before the new issue. Issuers with operating income above the sample median are classified as those with high operating profits.

Moody's and the issuer. Hence, we expect a greater loosening of credit ratings by Moody's for such marginal cases, after Moody's went public. As seen in Column IV of Table 6, the coefficient on *HighConfDum*, newly defined based on high operating profits, is negative and significant, and its interaction with *post2000Dum* is positive and significant. These results suggest that Moody's is relatively tougher on these issuers in the period prior to its IPO but it loosens up after its IPO. The coefficient of *post2000Dum* continues to be positive and significant in this specification as well.

Becker and Milbourn (2011) document that increased competition from Fitch leads to lower quality ratings from Moody's and S&P. Therefore, we examine whether competitive pressure from Fitch is likely to have a greater impact on a public Moody's. FISD two-digit industries with above median Fitch market share are classified as facing greater competition from Fitch. *HighConfdum* takes the value of one for bonds issued by firms in these industries facing high competition from Fitch. As seen in Column V of Table 6, the coefficient of *HighConfdum* is negative and significant while that of its interaction with *post2000dum* is positive and significant. Moody's ratings were relatively tougher on bond issues in high Fitch share industries prior to its IPO, but became significantly laxer after its IPO. The coefficient of *post2000dum* continues to be positive and significant pointing to the evidence of across the board relative laxity in Moody's ratings after its IPO. These tests suggest that the easing of ratings arising from increased competition from Fitch documented by Becker and Milbourn (2011) has a stronger impact on the publicly traded rating agency.

4.4. Outstanding bonds

The preceding section provides consistent evidence on the relative loosening of Moody's credit ratings of new bond issues after its IPO in 2000. In this section, we examine whether the relative loosening of credit ratings is also seen in the ratings of outstanding bonds. A direct way to address this question is to compare the timeliness of rating changes across rating agencies before and after Moody's went public. However, examining which agency is faster in its rating action requires the identification of the same rating change by both agencies, which is challenging given that rating changes by different agencies often occur

at different levels and for different magnitudes. For instance, consider a typical case with three rating events: (i) S&P downgrades a bond from AA- to A+ in May 1999; (ii) Moody's downgrades the same bond by two notches, from AA to A, in July 1999; and (iii) finally, S&P downgrades the bond again from A+ to A- in September 1999. This example highlights the difficulty in identifying a rating change from the same level and of the same magnitude by both rating agencies, rendering the direct comparisons in the timeliness of rating migrations across agencies rather difficult.

To capture these disparate levels, magnitudes and timing of rating changes, we estimate a measure of the differences between Moody's and S&P ratings on a daily basis. Specifically, we create an indicator variable, *Moody'sLeadDum*, which is set equal to one if Moody's assigned a higher rating than S&P for a particular bond on a particular day, and zero otherwise. *S&PLeadDum* is created in a similar way. To capture the fraction of the year for which Moody's rating is better than S&P's, we create a new variable, *LeadTimeDiff*, which is the average value of *Moody'sLeadDum* for the year minus the average value of the *S&PLeadDum* over the same year for the same bond. A positive value of *LeadTimeDiff* suggests that Moody's has a higher rating than S&P for a higher fraction of the year for that bond. Note that the value of *LeadTimeDiff* should be zero if (i) there are no differences between the ratings assigned by the two agencies for the bond; or if (ii) the differences between the ratings assigned by these two agencies are randomly distributed over time within a year.

In line with the model for new issues, we estimate a similar model for all outstanding bonds using *LeadTimeDiff* as the dependent variable. As seen in Column I of Table 7, the coefficient on *post2000Dum* is positive and highly significant (coefficient = 0.301, p-value < 0.01), confirming that Moody's had a more favorable rating than S&P, on average, for outstanding bonds after its IPO in 2000.

Similar to the earlier analysis with new bond issues, we examine whether greater loosening of Moody's rating standards occurs for clients that are large issuers of structured finance products and those with higher conflicts of interest. Consistent with the results for new issues, we find that outstanding corporate bonds issued by large sellers of structured products have a higher rating from Moody's relative to S&P after 2000. As seen in Column II of Table 7, the coefficient on the interaction of *post2000dum* and

HighConfDum is positive and significant. Results are qualitatively similar when we use bonds issued by financial firms to proxy for issuance of structured products (see Column III).

Similar to the previous section, we identify three settings where we expect greater laxity in Moody's ratings. The first of these is bonds issued by large issuers with results displayed in Column IV of Table 7. The second is firms that likely just missed a higher S&P rating (Column V), and finally we identify industries with above median Fitch market share (Column VI). We find (i) that the coefficient on *post2000dum* is positive and significant for all specifications, suggesting higher ratings by Moody's relative to S&P after 2000 on outstanding bonds; and (ii) a significant positive coefficient on the interaction of *HighconfDum* and *post2000dum*, in line with the view that Moody's granted higher ratings to (a) large issuers of corporate bonds; (b) to those that just missed higher S&P ratings and (c) in industries with more competition from Fitch after Moody's went public in 2000. The coefficient on *Highconfdum* in Columns IV and VI is negative and significant pointing to Moody's tendency to be tough on large issuers and in industries with greater Fitch presence, relative to S&P, prior to going public in 2000. In summary, the results for outstanding bonds mirror those for new issues.

5. Informativeness of Moody's ratings following its IPO

In this section, we examine whether the informativeness of ratings assigned by Moody's changes after it went public. Following Duffie, Saita, and Wang (2007), we first estimate the distance-to-default measure for each firm based on the Black–Scholes–Merton specification. Distance-to-default is roughly speaking the number of standard deviations of asset growth by which a firm's market value of assets exceeds a liability measure. The liability measure is the firm's book value of short term debt plus one half of its long term debt. This specification implies that the expected default frequency is the cumulative standard normal distribution function valued at the negative distance to default. Using the market value of equity and balance sheet data from COMPUSTAT, we use an iterative method to estimate this measure for each firm in our sample.

If Moody's relatively higher rating after 2000, as documented in prior sections, is justified, these higher relative ratings should be associated with a lower EDF. However, if these relatively higher ratings by Moody's after 2000 are a reflection of loosening standards, then such ratings should be associated with a higher EDF. We investigate this conjecture by including the estimate of EDF and the interaction of EDF with *post2000dum* in our base models for new issues where the dependent variable is *Ratingdiff*. As displayed in Column I of Table 8, the coefficient on EDF is negative and significant. This suggests that in the period prior to going public, higher *Ratingdiff*, pointing to a higher rating by Moody's relative to S&P, is associated with lower EDF. In other words, Moody's was relatively more accurate than S&P in the period prior to going public. However, the coefficient on the cross term of EDF and *post2000dum* is positive and significant. After its IPO, there is a significant decrease in the accuracy of Moody's ratings relative to S&P. Results are similar for outstanding bond issues, as displayed in Column II. In summary, there is little evidence that relatively higher credit ratings by Moody's post IPO are accompanied by lower EDF.

We also examine another measure of rating informativeness based on bond defaults. We extract information from FISD on whether a bond issue defaulted during our sample period. We include all defaults, including those due to a missed interest or a principal payment, bankruptcy and covenant violations. The indicator variable, *DefaultDum*, takes the value of one if the bond defaults in the following two years. This requires us to examine bond defaults over the period 1995-2007. We identify a total of 296 such bonds from the pre-public sample period, and 339 from the post-public period. Like before, *Ratingdiff* should be negatively associated with *Defaultdum* if Moody's relative higher ratings are associated with lower bond defaults. As seen in Column III of Table 8, the coefficient of *DefaultDum* is not significant while that of its interaction with *post2000dum* is positive and significant. Consistent with the EDF results, there is little evidence that relatively higher ratings by Moody's post IPO are accompanied by lower bond defaults.

6. Alternate explanations

In this section we discuss two potential alternate explanations for the results.[28] The first explanation arises from the differences in Moody's and S&P rating philosophies. Whereas Moody's explicitly accounts for the expected recovery rate in its ratings, S&P focuses on the probability of default. An explanation for the higher ratings by Moody's after 2000 could be the potentially higher recovery rates in this period. Higher recovery rates after 2000 will impact Moody's ratings although they will not have any effect on S&P ratings. Therefore, we examine whether recovery rates were higher in the years after 2000 relative to those before.

Moody's estimates recovery rates as the ratio of market bid prices roughly 30 days after the default date to par value.[29] To get an estimate of the bond market prices after default, we use bond transaction data from the Mergent FISD's NAIC bond transactions data file. In particular, we rely on the daily volume weighted average price within the 30 day period following the bond default to calculate the Moody's equivalent recovery rate.[30] As seen in Table 9, the average recovery rate for defaulted bonds in the years prior to Moody's IPO was 47.74%. This is not significantly different from the recovery rate of 48.95% in the years after Moody's IPO. Results are similar when we consider median recovery rates. As many bonds do not trade in the 30 day period after default, we extend the window to 45 days to increase the sample. As seen in Panel B, the recovery rate of 40.2% during the pre-public period is again not statistically different from the 46.88% during the post-public period. In summary, there is little evidence to suggest that recovery

[28] We thank an anonymous referee for suggesting these tests.

[29] Moody's Investor Service, 2008, Special Comment: Corporate Default and Recovery Rates, 1920-2007.

[30] We use the NAIC data as it is available over the entire sample period from 1995 to 2005. However, it only covers bond transactions by insurance companies. The Trade Report and Compliance Engine (TRACE) dataset includes all trades for bonds but only for the period after July 2002. We calculate daily volume weighted average price to estimate the value of the bond as in Cai, Helwege and Warga (2007) and Bessembinder, Kahle, Maxwell and Xu (2009). This is because bond trades of different sizes tend to occur at different prices. Lastly, as many defaulted bonds do not trade within the 30 days, the sample for which recovery rates can be estimated is small.

rates for corporate bonds increased after 2000. Differences in rating philosophy between Moody's and S&P are unlikely to explain our results.

Another potential confound affecting the results is Fitch's aggressive expansion after 2000. Becker and Milbourn (2011) document that increased competition from Fitch resulted in higher ratings from the incumbent rating agencies. As seen earlier, competition from Fitch has a greater impact on a publicly traded Moody's. To ensure that the differential response to Fitch's expansion does not explain our results, we perform additional tests. If increased competitive pressures from Fitch's expansion accounts for the results, then laxer relative ratings by Moody's after its IPO should be confined to industries that experienced large increases in Fitch's market share. Alternatively, there should be little or no evidence of post-IPO easing of Moody's ratings in industries with little change in competitive pressures. We test this hypothesis by calculating, for each industry, the change in Fitch's market share following Moody's IPO, i.e., from the pre- to the post-public period. We identify industries with the least change in competitive pressures as those where the increase in Fitch's market share is below the median of our sample (9%), and re-estimate our models in the sample of bonds in these industries. As reported in Table 10, we continue to find that the coefficient of *post2000dum* is positive and highly significant, for both new bond issues as well as all outstanding issues. In summary, even in industries that face little change in competition from Fitch, there is significant evidence of relative easing of Moody's ratings after its IPO. It is therefore unlikely, that increased competition from Fitch after 2000 explains all of our reported results.

7. Structured products

As discussed earlier, despite congressional testimonials pointing to the structured products group as the source of the laxer culture at Moody's, we examined corporate bonds due to the advantages associated with lower selection biases, longer time series and relatively well established risk criteria. Though there are data limitations in studying structured products for the research question in this paper, we briefly review and examine structured products in this section.

Griffin and Tang (2011) study a sample of 916 CDOs issued between 1997 and 2007 and show that one of the largest credit rating agencies made positive adjustments to its rating model that resulted in 12.1% higher AAA tranches. Benmelech and Dlugosz (2009b) examine 534 asset backed security (ABS) related CDOs over 2005-2008 and find that tranches with one rater only were more likely to be downgraded. This is consistent with "rating" shopping and its associated easing of standards by credit rating agencies.[31] He, Qian and Strahan (2012) examine a hand collected sample of mortgage backed securities issued between 2000 and 2006 and find that both Moody's and S&P give out more favorable ratings to large issuers, who likely generate more business and higher fees for these agencies. These papers examine the period after 2000 and document that ratings were not always accurate measures of default risk for structured products. Though these papers clearly point to problems in credit ratings for structured products, to our knowledge, there is no study that examines the relative loosening of Moody's ratings for structured products after it went public in 2000.

To examine this specific issue, we collect data on the initial ratings that each CDO received from Moody's and S&P from Bloomberg for the period 1997 to 2003 (excluding 2000) – a total of 1,098 deals with 5,063 tranches.[32] In line with prior literature documenting ratings shopping, only 308 deals with 1,213 tranches received ratings for all tranches from both Moody's and S&P. The average width of the first tranche is 70%, while that of the second tranche is about 19% (see Panel A of Table 11). In this sample, disagreement between Moody's and S&P is confined to about 6% of the deals (Panel B of Table 11).

[31] Benmelech and Dlugosz (2009b) also find that tranches rated by S&P only were more likely to be downgraded relative to those rated by Moody's or Fitch. This result however is found for the period 2005-2008 and does not span 2000, the year of Moody's IPO. Note that we do not claim that Moody's was better or worse than S&P in rating structured products. Our claim is merely that the relative quality of Moody's ratings, with respect to S&P, declined after 2000.

[32] There is little data on CDOs issuance from Bloomberg for the years 1995 and 1996. Therefore, for the sake of symmetry we restrict the post-public period to three years for this analysis.

Though the two rating agencies disagree on a small fraction of the deals, the majority of the disagreement (63%) relates to the first tranche. In an effort to increase sample size, we change our criteria to include all deals where at least one tranche is rated by both Moody's and S&P. The patterns are similar in this expanded sample of 703 deals with 3,790 tranches.

Consistent with Griffin and Tang (2011), we calculate the fraction of the deal financed at the AAA level as a measure of the aggressiveness (or laxity) with which the deal has been rated. The AAA fraction of a deal is determined by the deal's attachment point, which is the level of subordination that the AAA tranche(s) has beneath it. The laxer the credit rating standards, the lower the attachment point, and the higher the fraction of the deal that will be rated AAA. We define *Ratingdiff* as the fraction of the deal that was rated AAA by Moody's minus the fraction of the deal that was rated AAA by S&P. A positive value of *Ratingdiff* implies that Moody's had a relatively higher fraction of the deal with AAA rating and was hence laxer than S&P.

For the sample of deals that were rated by both Moody's and S&P, the average value of *Ratingdiff* is -0.023 for the 39 deals in the pre-public period, which is lower than the +0.026 for the 269 deals in the post-public period (See Panel A of Table 12). The difference of about 5% between the two periods is statistically significant at the 1% level. This suggests that the amount of subordination required to get a AAA rating by Moody's, compared to that required by S&P, decreases by about 5% following Moody's IPO. We also examine the rating differences at the tranche level. We create a dummy variable, *Moody's AAAdum*, which is set equal to one if Moody's rates a tranche AAA, and zero otherwise. A similar dummy, *S&P AAAdum*, is created for S&P. *Ratingdiff* for the tranche level analysis is equal to *Moody's AAAdum* minus *S&P AAAdum*. *Ratingdiff* is positive if Moody's is relatively laxer and more likely to rate the tranche AAA. At the tranche level, the mean *Ratingdiff* of -0.021 in the pre-public period is significantly lower than 0.007 in the post-public period. We repeat our analysis in the expanded sample that includes all deals

where at least one tranche is rated by both Moody's and S&P. As shown in Panel B, both deal level and tranche level analyses point to relative loosening of Moody's ratings for structured products after its IPO.[33]

8. Robustness tests

In this section, we examine the robustness of our results to the following: (i) longer time periods that include the financial crisis; (ii) shorter time windows that focus more narrowly on the IPO event; (iii) using Fitch as an alternative benchmark; (iv) restricting the sample to issuing firms that are present both before and after Moody's IPO; (v) controlling for industry-year fixed effects; and (vi) addressing potential bias from correlations among bonds of the same issuer.

8.1. Impact of the financial crisis

We investigate whether our results are robust to the inclusion of the unique circumstances associated with the financial crisis. Our research design thus far has relied on data from the five years before and after the 2000 IPO, and hence excludes the years 2007 to 2009, the period of financial crisis. To address this issue, we re-estimate our results using a longer window around the IPO, i.e., 1991 to 2009. Specifically, we now define the pre-public period as the nine-year period from 1991 to 1999, and the post-public period where the *post2000dum* is set to one for the years from 2001 to 2009. As seen in Panel A of Table 13, studying the nine year window before and after the IPO does not impact our results. The coefficient of *post2000dum* continues to be positive and highly significant for both new issues and outstanding issues.

8.2. Shorter time period around IPO

[33] It is worth stressing that to document relative easing of Moody's standards, we look at deals that are rated by both rating agencies and hence we are likely to miss the deals with the biggest problems, i.e., those subject to ratings shopping and rated by only one rating agency.

In the analysis reported so far, our research design has focused on studying five years before and after Moody's IPO to account for the fact that the resulting stock market induced pressure to report higher revenues may not have been instantaneous. However, a longer time period opens up the possibility of confounding events. Therefore, we also examine the effect of Moody's going public over a short time period, i.e. from 1999 to 2001, considering ratings for the one year before and after Moody's went public.

The results for both new issues and outstanding issues for this short time period are displayed in Panel B of Table 13. The coefficient on *post2000dum* for new issues is 0.475 and for outstanding issues is 0.114. Both are highly significant. In the shorter time period, the results again clearly point towards a loosening of Moody's credit ratings after going public. As mentioned earlier, the shorter time period also addresses concerns of biased standard errors due to serial correlation, as pointed out by Bertrand, Duflo and Mullainathan (2004).

8.3. Benchmarking against Fitch

Fitch is currently the third largest credit rating agency in the world. It was acquired by IBCA Limited of London in 1997 and in 2000 it acquired Duffs and Phelps, a publicly listed credit rating agency. The acquisition in 2000, the year of Moody's IPO, raises concerns about the suitability of Fitch as a benchmark. Nevertheless, we identify all new issues as well as outstanding issues that had ratings by both Moody's and Fitch. After ensuring that data on control variables are available, we have a sample of 5,851 new issues over the period 1995 to 2005 (excluding 2000) and 32,428 bond-years for the analysis of outstanding bonds.

The variable *RatingDiff* is now defined as the numerical equivalent of Fitch's rating minus the numerical equivalent of Moody's rating. A positive value of *RatingDiff* implies that Moody's has a more favorable rating than Fitch, similar to the previous sections. We find that Moody's assigned significantly more favorable ratings to new bond issues relative to Fitch in the years after 2000 in comparison to the years prior to 2000 (see Panel C of Table 13). The coefficient on *post2000Dum* is positive and highly significant at the 5% level. To capture rating differences on outstanding bonds, we define *LeadTimeDiff* as

the percentage of days in a year that Moody's has a higher rating minus the percentage of the days in the year that Fitch has a higher rating, and re-estimate Model (2). The coefficient on *post2000Dum* for this estimation is again positive and highly significant at the 1% level. In summary, even relative to Fitch, Moody's assigned more favorable ratings to new issues as well as to outstanding issues in the years after its IPO in 2000.

8.4. Restricting the sample to common issuing firms

The stock market downturn of 2000 could potentially have resulted in many firms going out of business. To control for the change in the composition of issuing firms and for the possibility that this change contaminates our results, we re-estimate the results for a subsample with the same issuing firms both before and after 2000. Specifically we include new bond issues only if they are issued by firms that issue bonds both in the pre- and the post-public period. This filter leads to 4,705 bond issues by 148 unique firms. Similarly, outstanding bonds are included only if the issuing firm has bonds outstanding in both periods. This restriction leads to 57,124 bond issues by 896 firms. As can be seen in Panel D, this sensitivity check does not qualitatively change the results.

8.5. Change in industry composition

Moody's and S&P could rely on different models to assign credit ratings. Such differences may place either of these agencies at a comparative advantage relative to the other in some industries. Changes in the industry composition of bond issues over the years could therefore impact relative credit ratings and hence our results on the relative loosening of Moody's ratings after 2000. To examine the sensitivity of our results to this concern, we re-estimate our models with industry-year fixed effects. The industry dummies are created at the two digit level based on the FISD industry classification.[34] Although these industry time effects absorb some of the time-based variation in the relative credit ratings, our results remain

[34] Industry-year dummies are created for all industries with more than 50 bonds over the sample period 1995 to 2005, not including 2000. To be included in this analysis, an industry-year has to have at least two bonds.

qualitatively similar. As displayed in Panel E, the coefficient of *post2000dum* is still significant, now with a *p*-value of 0.096 for new issues and a *p*-value of 0.010 for all issues.

8.6. Potential bias from correlations among bonds of the same issuer

Several of the bonds included in the sample are issued by the same firm. As bonds issued by the same firm tend to have similar ratings, this feature of the data could upwardly bias the significance statistics in our tests. To account for this concern, we have clustered the errors at the firm level for all our analysis. In this section, we conduct three additional tests to further ensure that the potential correlations among bonds issued by the same firm are not biasing our results. First, we estimate our results by including firm fixed effects. We include firm dummies if a firm issued two or more bonds along with the existing controls. As shown in Panel F, we continue to find that the coefficient of *post2000dum* is positive and significant for both the new issues and the outstanding issues samples.

Second, instead of including all bonds issued by a firm, we estimate the model using only one bond per firm. Specifically, for firms with bonds both in the pre- and the post-public periods, we retain their largest issue during each period, and re-estimate our models. We find a total of 296 bonds by 148 firms in the new issues sample. For the all issues sample, we focus on the 417 firms with some bonds outstanding for over two years in both the pre- and the post-public periods, and retain their largest issue in each period. As shown in Panel G, the coefficient of *post2000dum* remains positive and significant for both samples.

Lastly, instead of using pooled regressions, we estimate the following cross-sectional regression for each year in our sample:

$$Y_i = \gamma_0 + \sum_{j=2}^{8} ControlVar_i^j, \quad (3)$$

where the dependent variable Y_i is *RatingDiff* for the new issues sample, and it is *LeadTimeDiff* for the all issues sample. All control variables are as defined in model (1). Table 14 summarizes the estimated value of the intercept, γ_0 for the pre- and the post-public periods. We find that for new issues, the mean value of the intercept during the pre-public period is 0.170, which is lower than the 1.416 for the post-public

period. The difference is significant at the 6% level. For the all issues sample, the mean value of the intercept for the pre-public period is also significantly lower than that for the post-public period.

Because the above cross-sectional tests are conducted each year, there are only five estimates of the intercept for the pre- and the post-public periods. To increase the power of this test, we replicate the cross-sectional tests for each quarter and examine the changes in the intercept around 2000. For the new issues sample, we now estimate the above cross-sectional tests for all new bonds issued during one quarter at a time. The mean (median) value of the intercept for the pre-public period is again significantly lower than that for post-public period at the 5% level (see Panel B of Table 14). For the all issues sample, we re-calculate the dependent variable *LeadTimeDiff* at the quarterly level. Specifically, *LeadTimeDiff* is equal to the percentage of days within a quarter when Moody's assign a higher rating minus the percentage of days within the same quarter when S&P assign a higher rating for the same bond. With the new *LeadTimeDiff* as the dependent variable, we continue to find that the mean (median) value of the quarterly intercept for the pre-public period is lower than that for the post-public period at the 1% level.

9. Conclusions

In this paper, we investigate congressional allegations that going public changed Moody's from a conservative rating agency to one focused on market share and short term profits. To examine this allegation, we benchmark Moody's ratings to those of its main competitor, S&P, which did not undergo a change in its ownership status over this time period. We find significant evidence, both in economic and statistical terms, that Moody's was more likely to assign favorable ratings relative to S&P for new corporate bond issues in the period after its IPO. The increase in Moody's relative ratings implies a reduction of 13 to 19 basis points in yield, a decrease of 10 to 14 basis points in default rates, and a 5.5 to 8 basis points reduction in expected credit losses for the median rated bond.

A similar trend is seen in the ratings of outstanding bonds in that Moody's, relative to S&P, is significantly more favorable to issuers in the years after its IPO. The results also show that Moody's favorable ratings after going public were not accompanied by lower expected default frequencies (EDF) or

lower actual bond defaults. Our results are robust to alternative specifications in the event windows, to the use of Fitch's ratings as the benchmark, and to changes in the composition of firms that issued bonds before and after Moody's IPO. We also rule out several alternate explanations though it should be stressed that the results are based on a single event, Moody's IPO, and it is possible that that we have omitted to control for some unidentified idiosyncratic factors that might explain our findings.

Although such relative loosening of Moody's credit rating standards after it went public is seen for all bonds, it is significantly more pronounced for corporate bonds issued by large issuers of structured finance products and by financial firms. This finding corroborates employees' testimonies at congressional hearings that the new culture at Moody's was focused on market share and the lower rating standards originated from the structured products group. The loosening of rating standards in corporate bonds is also significantly greater for large and frequent issuers of corporate bonds and for those most likely to gain from a higher rating. In sum, our evidence points to the importance of ownership structure and consequent market pressures on the ratings issued by credit agencies.

REFERENCES

Acharya, V., Richardson, M., 2009. Causes of financial crisis. *Critical Review* 21, 195–210.

Adams, E., Matheson, J., 1998. Law firms on the big board: A proposal for non-lawyer investment in law firms. *California Law Review* 86, 1–2.

Alp, A., 2013. Structural shifts in credit rating standards. Forthcoming at *Journal of Finance*.

An, X., Deng, Y., Sanders, A., 2008. Subordination levels in structured financing, in Anjan Thakor and Arnoud Boot. In: Thakor, A., Boot, A. (Ed.), *Handbook of Financial Intermediation and Banking*. North Holland, Amsterdam.

Asker, J., Farre-Mensa, J., Ljungqvist, A., 2012. Comparing the investment behavior of public and private firms. Unpublished working paper: New York University.

Becker, B., Milbourn, T., 2011. How did competition affect credit ratings? *Journal of Financial Economics* 101, 493–514.

Benmelech, E., Dlugosz, J., 2009a. The alchemy of CDO credit ratings. *Journal of Monetary Economics* 56, 617–634.

Benmelech, E., Dlugosz, J., 2009b. The credit rating crisis. Unpublished working paper: NBER.

Berle, A., Means., G., 1932. The modern corporation and private property. Transaction Publishers, New York.

Berry, K., Bizjak, J., Lemmon, M., Naveen, L., 2006. Organizational complexity and CEO labor Market: Evidence from diversified firms. *Journal of Corporate Finance* 12, 797–817.

Bertrand, M., Duflo, E., Mullainathan, S., 2004. How much should we trust differences-in-differences estimates. *Quarterly Journal of Economics* 19, 249–275.

Bhojraj, S., Hribar, P., Picconi, M., McInnis, J., 2009. Making sense of cents: An examination of firms that marginally miss or beat analyst forecasts. *Journal of Finance* 64, 2361–2388.

Bhide, A., 1993. The hidden cost of stock market liquidity. *Journal of Financial Economics* 34, 34–51.

Blume, M., Lim, F., MacKinlay, A., 1998. The declining credit quality of U.S. corporate debt: myth or reality? *Journal of Finance* 53, 1389–1413.

Bolton, P., Xavier, F., Shapiro, J, 2012. The credit ratings game. *Journal of Finance* 67, 85–111.

Bongaerts, D., Cremers, M., Goetzmann, W., 2012. Tiebreaker: Certification and multiple credit ratings. *Journal of Finance* 67, 113–152.

Bonsall, S., 2012. The informational effects of firm funded certification: Evidence from the bond rating agencies. Unpublished working paper: Ohio State University.

Bowen, R., Rajgopal, S., Venkatachalam, M., 2012. Is Warren Buffett's commentary on accounting, governance and investing practices reflected in the investment decisions and subsequent influence of

Berkshire Hathaway? Unpublished Working paper: University of San Diego, Emory University and Duke University.

Buffett, W., 2010. Testimony before the FCIC: Hearing on the credibility of credit ratings, the investment decisions made based on those ratings, and the financial crisis. Session 2: Credit Ratings and the Financial Crisis.

Bushee, B., 1998. The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review* 73, 305–333.

Bessembinder, H., Kahle, K., Maxwell, W., Xu, D., 2009. Measuring abnormal bond performance, *Review of Financial Studies* 22, 4219–4258.

Cai, N., Helwege, J., Warga, A., 2007. Underpricing in the corporate bond market. *Review of Financial Studies* 20, 2021–2046.

Cornaggia, J., Cornaggia, K., 2013. Estimating the costs of issuer-paid credit ratings. Forthcoming at *Review of Financial Studies*.

Cornaggia, J., Cornaggia, K., Xia, H., 2012. Conflicted credit analysts, Unpublished Working Paper: Indiana University.

Chapman, C., Steenburgh T., 2011. An investigation of earnings management through marketing actions. *Management Science* 57, 72–92.

Dechow, P., Sloan, R., 1991. Executive incentives and the horizon problem. *Journal of Accounting and Economics* 14, 51–89.

Debuse, J., 2008. Opening at $25 1/2 is Big Firm U.S.A.: Why America may eventually have a publicly traded law firm, and why law firms can succeed without going public. *Journal of Corporation Law* 34, 317–347.

Duffie, D., Saita, L., Wang, K., 2007. Multi-period corporate default prediction with stochastic covariates. *Journal of Financial Economics* 83, 635–65.

Ellul, A., Jotikasthira, C., Lundblad, C., 2011. Regulatory pressure and fire sales in the corporate bond market. *Journal of Financial Economics* 101, 596–620.

Fee, E., Hadlock, C., 2004, Management turnover across the corporate hierarchy. *Journal of Accounting and Economics* 37, 3–38.

Financial Crisis Inquiry Commission, 2011. Final report of the National Commission on the causes of the financial and economic crisis in the United States.

Froeba, M., 2010. Testimony before the Financial Crisis Inquiry Commission, June 2, 2010.

Gilje, E., Taillard, J., 2012. Do private firms invest differently than public firms? Taking cues from the natural gas industry. Unpublished Working Paper: Boston College.

Gilpin, K., 1999. Dun and Bradstreet will spin off Moody's. The New York Times, December 16, 1999.

Graham, J., Harvey, C., 2001. The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics* 60, 187–243.

Graham, J., Harvey, C., Rajgopal, S., 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40, 3–73.

Griffin, J., Tang, D., 2012. Did subjectivity play a role in CDO credit rating? *Journal of Finance* 67, 1293–1328.

Griffin, J., Nickerson, J., Tang, D., 2013. Rating shopping or catering? An examination of the response to competitive pressure for CDO credit ratings. Forthcoming at *Review of Financial Studies*.

He, J., Qian J, Strahan, P, 2012. Are all ratings created equal? The impact of issuer size on the pricing of mortgage backed securities. *Journal of Finance* 67, 2097–2137.

Holmstrom, B., Milgrom, P., 1991. Multitask principal-agent analyses: Incentive contracts, asset ownership and job design. *Journal of Law, Economics and Organization* 7, 24–42.

Jensen, M., Meckling, W., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3, 305–360.

Jiang, J., Stanford, M., Xie, Y., 2012. Does it matter who pays for bond ratings? Historical evidence. *Journal of Financial Economics* 105, 607–621.

Jorion, P., Liu, Z., Shi, C., 2005. Informational effects of Regulation FD: Evidence from rating agencies. *Journal of Financial Economics* 76, 309–330.

Kahn, J., 1998. Plan to go public at Goldman Sachs. *New York Times*. June 15, 1998.

Kaplan, R., Urwitz, G., 1979. Statistical models of bond ratings: A methodological inquiry. *Journal of Business* 52, 231–261.

Kisgen, D., 2006. Credit ratings and capital structure. *Journal of Finance* 61, 1035–1072.

Kisgen, D., Strahan, P., 2010. Do regulations based on credit ratings affect a firm's cost of capital? *Review of Financial Studies* 23, 4324–4347.

Kraft, P., 2011. The impact of the contractual use of ratings on the rating process—Evidence from rating agency adjustments. Unpublished Working Paper: University of Chicago.

Kroezner, R., Shiller, R., 2011. Reforming U.S. financial markets. MIT Press.

Lamont, O., 1997. Cash flow and investment: Evidence from internal capital markets. *Journal of Finance* 52, 83–109.

Mathis, J., McAndrews, J., Rochet, J., 2009. Rating the raters: Are reputation concerns powerful enough to discipline rating agencies? *Journal of Monetary Economics* 56, 657–674.

McLean, B., Nocera, J., 2010. All the Devils are Here: The Hidden History of the Financial Crisis. Penguin Group.

Michalek, R., 2010. Testimony before the FCIC, Hearing on the credibility of credit ratings, the investment decisions made based on those ratings, and the financial crisis. Session 3: The Credit Rating Agency Business Model.

Morrison, A., Wilhelm, W., 2008. The demise of investment banking partnerships: Theory and evidence. *Journal of Finance* 63, 311–350.

Pagano, M., Panetta, F., Zingales, L., 1998, Why do companies go public? An empirical analysis. *Journal of Finance* 53, 27–64.

Partnoy, F., 1999. The Siskel and Ebert of financial markets: Two thumbs down for the credit rating agencies. *Washington University Law Review* 77, 619–714.

Permanent Subcommittee on Investigations. 2011. Wall street and the financial crisis. Anatomy of a financial collapse. Majority and Minority Staff Report.

Pinches, G., Mingo, K., 1973. A multivariate analysis of industrial bond ratings. *Journal of Finance* 28, 1–16.

Rajan, R., Servaes, H., Zingales, L., 2000. Cost of diversity: The diversification discount and inefficient investment, *Journal of Finance* 55, 35–80.

Roychowdhury, S., 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics* 42, 335–370.

Saunders, A., Steffen, S., 2011. The costs of being private: Evidence from the loan market. *Review of Financial Studies* 24, 4091–4122.

SEC. 2011. Summary report of commission staff's examinations of each nationally recognized statistical rating organization.

Skinner, D., Sloan, R., 2002. Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of Accounting Studies* 7, 289–312.

Scharfstein, D., Stein, J., 2000. The dark side of internal capital markets: Divisional rent-seeking and inefficient investment. *Journal of Finance* 55, 2537–2564.

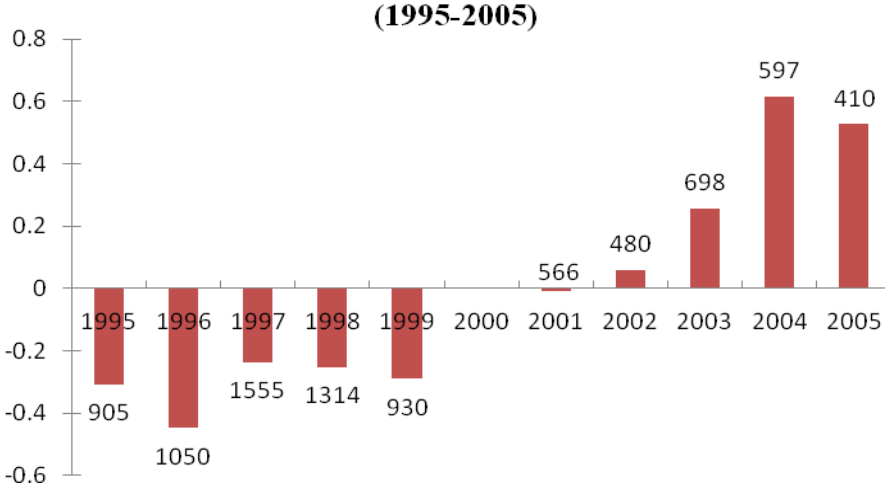
Stein, J., 1989. Efficient capital markets, inefficient firms: A model of myopic corporate behavior. *The Quarterly Journal of Economics* 104, 655–669.

Stein, J., 2002. Information production and capital allocation: Decentralized versus hierarchical firms. *Journal of Finance* 57, 1891–1921.

Xia, H., 2010. The issuer-pay rating model and rating inflation: Evidence from corporate credit ratings. Unpublished Working Paper: University of North Carolina.

.

Figure 1: Difference in Credit Ratings Assigned by Moody's and S&P around Moody's IPO in 2000 (1995-2005)



The length of the bar in the figure represents the yearly average of the *RatingDiff* variable. Note that there is no value plotted for 2000, the year of the Moody's IPO. *RatingDiff* is the S&P's numerical rating minus the Moody's numerical rating for new bond issues, coded as per Table 1. As smaller numbers correspond to higher ratings, a positive (negative) value of *RatingDiff* implies that Moody's assigns a higher (lower) rating than S&P. The number on top of each bar represents the number of new bond issues over which the *RatingDiff* variable was computed every year.

Table 1: Numerical Coding of Rating Categories and Frequencies of Such Categories for New Bond Issues

This table provides summary information on Moody's and S&P's credit rating on new corporate bonds issued over the period 1995 to 2005 (excluding 2000). Panel A presents the frequency distributions of our bonds across different rating categories by Moody's and S&P, and the numerical coding of each rating category. Panel B presents the mean and median of the numerical ratings of our sample bonds assigned by Moody's and S&P.

Panel A: Frequency Distribution

	Numeric Rating	Moody's		S&P	
		Credit Rating Letter	Frequency (%)	Credit Rating Letter	Frequency (%)
		Investment-grade			
Highest Quality	1	Aaa	0.21	AAA	0.25
Very High Quality	2	Aa1	0.07	AA+	0.68
	3	Aa2	0.92	AA	1.61
	4	Aa3	17.32	AA-	9.68
High Quality	5	A1	11.13	A+	11.57
	6	A3	22.54	A	32.58
	7	A3	5.62	A-	4.83
Minimum Investment Grade	8	Baa1	8.00	BBB+	5.02
	9	Baa2	4.67	BBB	4.84
	10	Baa3	3.01	BBB-	3.14
		High-yield			
Low Grade	11	Ba1	1.72	BB+	1.63
	12	Ba2	1.27	BB	7.88
	13	Ba3	6.67	BB-	1.65
Very Speculative	14	B1	5.03	B+	3.64
	15	B3	4.96	B	5.08
	16	B3	5.2	B-	4.26
Substantial Risk	17	Caa1	1.00	CCC+	0.93
	18	Caa2	0.47	CCC	0.55
	19	Caa3	0.16	CCC-	0.12
Very Poor Quality	20	Ca	0.04	CC	0.06
	21	C	0.00	C	0.00

Panel B: Summary Statistics on Numerical Ratings

	Moody's		S&P	
	Mean	Median	Mean	Median
Full Sample	8.17	6	8.06	6
Investment-grade	5.97	6	6.03	6
High-yield	14.26	14	13.89	14

Table 2: Descriptive Statistics of Firms Issuing Rated New Bonds

The table presents summary information on the bond issuers in our sample. Issuer Size is the market value of equity plus the book value of debt. Leverage is long term debt divided by total assets. Operating Margin is operating income before depreciation divided by sales. Stock return standard deviation is the standard deviation of daily stock returns in the year prior. Issue size is the par value of the bond issue. Moody's and S&P's Ratings are the numeric values of the ratings assigned by Moody's and S&P, coded as per Table 1. All firm characteristics are measured the year prior to the new issue.

	Mean	Median	Std.
Issuer Size ($ million)	93,589.51	38,808.46	117,998.88
Leverage	0.27	0.21	0.19
Operating Margin	0.22	0.43	6.58
Stock Return Standard Deviation	0.06	0.02	0.15
Issue Size ($ million)	141.40	50.00	291.00
Time to Maturity at Issuance (Years)	7.75	5.76	8.03
Moody's Ratings	8.17	6	4.04
S&P Ratings	8.06	6	3.84

Table 3: Univariate Comparisons of Ratings of New Issues between Moody's and S&P

This table presents summary information on Moody's and S&P's respective numerical ratings of the new bond issues, and the variable *RatingDiff*, which is S&P's numerical rating minus Moody's numerical rating for each bond, coded as per the legend to Table 1. As smaller numbers mean higher ratings, a positive value of *RatingDiff* implies that Moody's assigns a higher rating than S&P. The column "Pre-Moody's IPO" covers all eligible new bonds issued over 1995 to 1999. The column "Post-Moody's IPO" includes all eligible new bond issues over 2001 to 2005. The column "Difference Test" presents the *p*-values related to the test of the difference in *RatingDiff* between the Pre- and the Post-Moody's IPO periods. "Investment-grade category (IV)" includes all new issues where both Moody's and S&P assigned an investment grade rating at the time of issuance. "High-Yield (HY)" refers to new issues where both Moody's and S&P assigned a high yield rating at the time of issuance. "Across IV and HY" refers to the small sample of new issues where one rating agency assigns an investment-grade rating while the other assigns a high-yield rating.

	Pre-Moody's IPO			Post-Moody's IPO			Difference Test
	Moody's Rating	S&P's Rating	RatingDiff	Moody' Rating	S&P's Rating	RatingDiff	(*p*-value)
Full Sample							
Mean	8.515	8.213	-0.302	7.455	7.741	0.286	0.000
Median	7.000	6.000	0.000	6.000	6.000	0.000	0.000
Nobs	5,722	5,722	5,722	2,783	2,783	2,783	
Investment grade (IV)							
Mean	6.235	6.046	-0.189	5.423	5.847	0.425	0.000
Median	6.000	6.000	0.000	5.000	6.000	0.000	0.000
Nobs	4,076	4,076	4,076	2,150	2,150	2,150	
High-yield (HY)							
Mean	14.273	13.706	-0.567	14.665	14.507	-0.158	0.000
Median	14.000	14.000	-1.000	15.000	15.000	0.000	0.000
Nobs	1,588	1,588	1,588	582	582	582	
Across IV and HY							
Mean	11.069	10.103	-0.966	10.843	10.353	-0.490	0.057
Median	11.000	10.000	-1.000	11.000	10.000	-1.000	0.037
Nobs	58	58	58	51	51	51	

Table 4: Did Moody's Assign Higher Ratings for New Issues after its IPO?

The dependent variable in Columns I to II is *RatingDiff*. In Columns III and IV, it is the numerical rating by Moody's and S&P respectively. *RatingDiff* is S&P rating minus Moody's rating. *Post2000Dum* is one for bonds issued during the post-public period and zero otherwise. *IssuerSize* is the natural log of market value. *Leverage* is ratio of long-term debt to total assets. *OpMargin* is operating income before depreciation divided by sales. *Stkreststd* is the standard deviation of daily stock returns in the year prior to the issuance. *IssueSize* is the logarithm of the par value of the bond issue. Variables are measured in the year prior to the new issue. Heteroscedasticity adjusted robust *p*-values are in parentheses. We cluster standard errors by the issuing firm.

	I *RatingDiff*	II *RatingDiff*	III *Moody's rating*	IV *S&P's rating*
Intercept	-0.299	0.155	8.401	8.556
	(0.000)***	(0.531)	(0.000)***	(0.000)***
post2000Dum	0.585	0.851	-0.935	-0.084
	(0.000)***	(0.000)***	(0.000)***	(0.888)
IssuerSize		-0.010	-1.259	-1.269
		(0.862)	(0.000)***	(0.000)***
Leverage		-0.105	2.755	2.651
		(0.719)	(0.010)***	(0.0155)**
OpMargin		-0.006	-0.026	-0.032
		(0.000)***	(0.000)***	(0.000)***
Stkretstd		-1.314	7.397	6.083
		(0.000)***	(0.000)***	(0.000)***
IssueSize		0.034	0.193	0.227
		(0.290)	(0.119)	(<.031)**
YTM		-16.560	-65.638	-82.198
		(0.220)	(0.112)	(0.033)**
SeniorDum		-0.188	-1.673	-1.860
		(0.072)*	(0.000)***	(0.000)***
IssuerSize*post2000Dum		0.123	0.041	0.164
		(0.043)**	(0.747)	(0.151)
Leverage*post2000Dum		-0.052	1.290	1.238
		(0.881)	(0.347)	(0.372)
OpMargin*post2000Dum		0.006	0.015	0.021
		(0.000)***	(0.000)***	(0.000)***
Stkretstd*post2000Dum		1.725	9.575	11.300
		(0.641)	(0.356)	(0.313)
IssueSize*post2000Dum		-0.106	-0.012	-0.118
		(0.012)**	(0.920)	(0.229)
YTM*post2000Dum		6.859	124.945	131.804
		(0.759)	(0.002)***	(0.001)***
Seniordum*post2000Dum		0.019	-0.096	-0.077
		(0.897)	(0.830)	(0.850)
Adjusted R-square	0.095	0.216	0.765	0.762
N	8,505	8,505	8,505	8,505

Table 5: Summary Statistics on Structured Products Issuance

This table provides summary information on the issuance of structured finance products from 1995 to 2005. The structured products included are Asset-Backed Securities (ABS), Mortgage-Backed Securities (MBS), and Collateralized debt obligations (CDOs). The data comes from the ABS database managed by J.P. Morgan's Asset Backed Alert.

Year	Total Issuance ($Billion)	Number of Issues	Number of Issuers	Share of Top 40 Issuers
1995	142.65	492	208	0.75
1996	212.01	684	279	0.68
1997	322.49	903	328	0.62
1998	438.46	1015	352	0.61
1999	416.80	1002	358	0.57
2000	399.63	938	315	0.59
2001	529.90	1157	308	0.69
2002	688.39	1521	286	0.76
2003	861.18	1760	253	0.78
2004	1115.81	1948	266	0.80
2005	1605.60	2400	341	0.76

Table 6: Cross Sectional Variation in Moody's Ratings Post IPO for New Issues

This table displays partial results for the OLS estimation where the dependent variable was *RatingDiff*, the S&P numerical rating minus the Moody's numerical rating. *Post2000Dum* takes the value of one if the bond is issued between 2001 and 2005 and zero otherwise. In Column I (II), *HighConfDum* takes the value one if the bond is issued by firms that are large issuers of structured finance products (financial firms). In Column III (IV) *HighConfDum* takes the value one if the bond is issued by a large issuer (the issuers' profit margin is above the median for that S&P's rating grade). In Column V, *HighConfdum* takes the value one if Fitch's market share in the two digit FISD industry is above the median value for the year. Other variables included but not reported in the table are *IssuerSize* (natural log of total market value), *Leverage* (ratio of long-term debt to total assets), *OpMargin* (operating income before depreciation divided by sales), *Stkreststd (*standard deviation of daily stock returns in the year prior to the issuance), *IssueSize* (log of the par value of the bond issue), *YTM* (number of years to maturity), *Seniordum* (dummy variable that is one for senior debt). All accounting variables are measured in the year prior to the new issue. Heteroscedasticity adjusted robust *p*-values are in parentheses. We cluster standard errors by the issuing firm. ***, **, * represent significance at 1%, 5% and 10% level, respectively.

	I	II	III	IV	V
Issuer Characteristics	Structured Products	Finance Firms	Large and Frequent	Missed S&P higher Rating	High Fitch Market Share
Intercept	0.133	0.047	0.291	0.228	0.277
	(0.193)	(0.604)	(0.002)***	(0.009)***	(0.006)***
post2000dum	0.632	1.036	0.699	0.744	0.246
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.019)**
HighConfDum	0.024	0.320	-0.205	-0.415	-0.122
	(0.867)	(0.000)***	(0.000)***	(0.000)***	(0.003)***
HighConfdum*post2000dum	0.212	0.320	0.308	0.368	0.567
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
	Control variables have been included in the estimation but not reported				
Adjusted R-square	0.218	0.238	0.219	0.213	0.224
N	8,505	8,505	8,505	8,505	8,505

Table 7: Moody's Higher Ratings for All Bond Issues After its IPO

This table presents results from the OLS regressions where the dependent variable is *LeadTimeDif*, the fraction of a year where Moody's assigns a higher rating minus the fraction where S&P assigns a higher rating. *Post2000Dum* is a dummy variable that takes the value of one for the years in the post-public period, and zero otherwise. *HighConfDum* takes the value one if issuer is a large issuer of structured products (Column II), a finance firm (Column III), a large issuer of corporate bonds (Column IV), missed a higher S&P rating (Column V) and in industry with above median Fitch Market share (Column VI). Other variables are defined as in Table 4. All models include a constant which has not been reported for brevity. Heteroscedasticity adjusted robust *p*-value are in parentheses. We cluster standard errors by the issuing firm. ***, **, * represent significance at 1%, 5% and 10% level, respectively.

	I	II	III	IV	V	VI
	Base	Structured Products	Finance Issuers	Large Issuers	Missed S&P higher Rating	High Fitch Market Share
post2000Dum	0.301	0.197	0.165	0.257	0.229	0.053
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
HighConfDum		0.026	0.227	-0.128	0.011	-0.097
		(0.011)**	(0.000)***	(0.000)***	(0.085)*	(0.000)***
HighConfDum*post2000dum		0.323	0.445	0.052	0.132	0.295
		(0.000)***	(0.000)***	(0.010)**	(0.000)***	(0.000)***
IssuerSize	0.016	0.013	0.001	0.020	0.015	0.025
	(0.000)***	(0.000)***	(0.693)	(0.000)***	(0.000)***	(0.000)***
Leverage	0.087	0.083	0.046	0.114	0.083	0.102
	(0.000)***	(0.000)***	(0.034)**	(0.000)***	(0.000)***	(0.000)***
OpMargin	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Stkretstd	-0.246	-0.264	-0.159	-0.255	-0.244	-0.295
	(0.011)**	(0.005)***	(0.118)	(0.008)***	(0.011)**	(0.002)**
IssueSize	0.005	0.005	0.005	0.005	0.005	0.004
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.004)***
YTM	0.019	0.020	0.026	0.019	0.019	0.017
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Seniordum	-0.044	-0.043	0.004	-0.036	-0.044	-0.045
	(0.000)***	(0.000)***	(0.696)	(0.000)***	(0.000)***	(0.000)***
IssuerSize*post2000Dum	0.099	0.070	0.085	0.098	0.093	0.073
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Leverage*post2000Dum	-0.538	-0.488	-0.418	-0.554	-0.543	-0.631
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
OpMargin*post2000Dum	0.006	0.006	0.005	0.006	0.006	0.006
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Stkretstd*post2000Dum	0.225	0.241	0.144	0.234	0.226	0.277
	(0.020)**	(0.011)**	(0.158)	(0.016)**	(0.020)**	(0.004)***
IssueSize*post2000Dum	0.009	0.009	0.021	0.009	0.006	0.017
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.007)***	(0.000)***
YTM*post2000Dum	-0.005	0.009	-0.029	-0.004	-0.010	0.003
	(0.300)	(0.060)*	(0.000)***	(0.411)	(0.038)**	(0.457)
Seniordum*post2000Dum	-0.127	-0.157	0.004	-0.134	-0.117	-0.12
	(0.000)***	(0.000)***	(0.761)	(0.000)***	(0.000)***	(0.000)***
Adjusted R-square	0.093	0.106	0.135	0.095	0.187	0.104
N	81,641	81,641	81,641	81,641	81,641	81,641

Table 8: Alternate Measure of Rating Accuracy

The dependent variable for the New Issues sample is *Ratingdiff*, and it is *Leadtimediff* for the All Issues sample. *Post2000dum* is a dummy that takes the value one for years after 2000, and zero otherwise. The first two columns use *EDF* which is the expected default frequency estimated using the Black-Scholes-Merton specification for an issuing firm in the sample. The third column uses *Defaultdum*, a dummy that takes the value one if the bond defaults in the next two years. The remaining variables are as defined in Table 4. The number below each estimate of the coefficients is heteroscedasticity adjusted robust *p*-value. We cluster standard errors by the issuing firm. ***, **, * represent significance at 1%, 5% and 10% level, respectively.

	I. New Issues EDF	II. All Issues EDF	III. All Issues Bond Default
Intercept	0.251	-0.022	-0.041
	(0.260)	(0.009)***	(0.000)***
post2000dum	0.623	0.301	0.298
	(0.000)***	(0.000)***	(0.000)***
EDF (DefaultDum)	-0.404	-0.153	0.020
	(0.000)***	(0.000)***	(0.530)
EDF(DefaultDum)*post2000dum	0.366	0.064	0.176
	(0.099)*	(0.013)***	(0.000)***
IssuerSize	0.005	0.017	0.016
	(0.702)	(0.000)***	(0.000)***
Leverage	0.040	0.105	0.085
	(0.740)	(0.000)***	(0.000)***
OpMargin	-0.005	-0.063	-0.005
	(0.000)***	(0.628)	(<.0001)***
Stkretstd	-0.355	-0.005	-0.249
	(0.123)	(0.000)***	(0.010)**
IssueSize	0.057	0.006	0.005
	(0.001)***	(0.000)***	(0.001)***
YTM	-18.612	0.014	0.019
	(0.072)*	(0.000)***	(0.000)***
SeniorDum	-0.158	-0.044	-0.044
	(0.001)***	(0.000)***	(0.000)***
IssuerSize*post2000dum	0.079	0.098	0.099
	(0.000)***	(0.000)***	(0.000)***
Leverage*post2000dum	-0.135	-0.522	-0.552
	(0.488)	(0.000)***	(0.000)***
OpMargin*post2000dum	0.006	0.054	0.006
	(0.000)***	(0.680)	(0.000)***
Stkretstd*post2000dum	3.317	0.006	0.228
	(0.089)*	(0.000)***	(0.018)**
IssueSize*post2000dum	-0.159	0.008	0.009
	(0.000)***	(0.000)***	(0.000)***
YTM*post2000dum	-12.112	0.000	-0.005
	(0.533)	(0.923)	(0.296)
SeniorDum*post2000dum	0.090	-0.129	-0.126
	(0.282)	(0.000)***	(0.000)***
Adjusted R-square	0.205	0.095	0.094
N	8,505	81,641	81,641

Table 9: Recovery Rates

This table displays recovery rates for bonds in default before and after Moody's IPO in 2000. In Panel A (B) recovery rate is estimated as the ratio of the market bid price around 30 (45) days after default to the par value. We test the difference in recovery rates in the Pre- Moody's IPO period (1995 to 1999) from that in the Post-Moody's IPO period (2001 to 2005) and report the *p*-values in the column "Difference Test". ***, **, * represent significance at 1%, 5% and 10% level, respectively.

		Pre-Moody's IPO	Post-Moody's IPO	Difference Test (*p*-value)
Panel A: 30 days following default (%)				
	Mean	47.746	48.956	0.871
	Median	44.500	44.210	0.933
	Nobs	15	88	
Panel B: 45 days following default (%)				
	Mean	40.204	46.887	0.377
	Median	42.000	42.000	0.493
	Nobs	18	104	

Table 10: Impact of Fitch's Expansion

This table displays the estimation of the base model for new issues (Column I) and all issues (Column II) in a sample of industries with the least growth in Fitch Competition from the pre-public period (1995 to 1999) to the post-public period (2001 to 2005). Competition from Fitch is captured as the market share of Fitch in all corporate bond ratings in the FISD two-digit industry. The least growth industries are those with below median growth rate in Fitch's market share from the pre- to the post-public period. Other variables included but not reported in the table are *IssuerSize* (natural log of total market value), *Leverage* (ratio of long-term debt to total assets), *OpMargin* (operating income before depreciation divided by sales), *Stkreststd (* standard deviation of daily stock returns in the year prior to the issuance), *IssueSize* (log of the par value of the bond issue), *YTM* (number of years to maturity) and *Seniordum* (dummy variable that is one for senior debt). The interactions of all variables with the *post2000dum* were also included. All accounting variables are measured in the year prior to the new issue. Heteroscedasticity adjusted robust *p*-values are in parentheses. We cluster standard errors by the issuing firm. ***, **, * represent significance at 1%, 5% and 10% level, respectively.

	I. New Issues	II. All Issues
Intercept	0.173	0.082
	(0.424)	(0.000)***
post2000Dum	0.819	0.310
	(0.000)***	(0.000)***
	Control variables included but not tabulated	
Adjusted R-square	0.056	0.091
N	2,976	44,077

Table 11: Summary Information for CDOs

Panel A displays summary statistics of the width of the first three tranches for CDOs issued between 1997 and 2003 (excluding 2000). Summary statistics are presented both for the sample of 308 deals with all tranches rated by both agencies, and the sample of 703 deals with at least one tranche rated by both agencies. Information for higher level tranches has not been reported for brevity. Panel B analyzes AAA tranche ratings disagreement between Moody's and S&P.

Panel A: Summary statistics of tranche width

	Deals with all tranches rated by both agencies				Deals with at least one tranche rated by both agencies			
Tranche	Mean	Median	Std	N	Mean	Median	Std	N
1	70%	77%	27%	308	62%	69%	27%	703
2	19%	13%	16%	233	18%	12%	16%	626
3	11%	7%	11%	212	10%	7%	10%	589

Panel B: AAA tranche ratings disagreement between Moody's and S&P

	Deals with all tranches rated by both agencies		Deals with at least one tranche rated by both agencies	
	Number of Deals	% Total	Number of Deals	% Total
No AAA Tranche	17	6%	36	5%
Agreement on AAA	272	88%	586	83%
Disagreement on AAA	19	6%	81	11%
Disagreement on 1st Tranche	12	63%	24	30%
Disagreement on 2nd Tranche	5	23%	23	29%

Table 12: Initial Ratings on CDOs

The sample consists of CDOs issued between 1997 and 2003 excluding 2000. Pre-Moody's IPO consists of CDOs issued over the period 1997 to 1999 and Post-Moody's IPO consists of deals issued over the period 2001 to 2003. Panel A include deals where all tranches were rated by both Moody's and S&P. Panel B consist of deals with at least one tranche that is rated by both Moody's and S&P. The table displays the mean and median values of *Ratingdiff*. For the deal level analysis, *Ratingdiff* is the difference in the fraction of the deal that is rated AAA by Moody's minus the fraction of the deal that is rated AAA by S&P. Fraction of the deal that is AAA is the number of tranches that are AAA rated over the total number of tranches. For the tranche level analysis, *Ratingdiff* is the dummy that is one when Moody's rates the tranche as AAA minus the dummy when S&P rates the tranche as AAA. Nobs is the number of deals/ tranches. Total issuance is the par value of the deals/tranches. The *p*-value is for test on the difference in Pre-Moody IPO and Post-Moody IPO mean and median. ***, **, * represent significance at 1%, 5% and 10% level, respectively.

		Pre-Moody's IPO	Post-Moody's IPO	Difference Test (*p*-value)
	Total Issuance ($ Billion)	1,243	2,309	
Panel A: Deal with all tranches rated by both Moody's and S&P				
Deal level	Mean	-0.023	0.026	0.008***
	Median	0	0	0.034**
	Nobs	39	269	
	Total Issuance	272	1,131	
Tranche Level	Mean	-0.021	0.007	0.015**
	Median	0	0	0.008***
	Nobs	145	1068	
	Total Issuance	272	1,131	
Panel B: Deals with at least one tranche rated by both Moody's and S&P				
Deal Level	Mean	-0.011	0.010	0.036**
	Median	0	0	0.124
	Nobs	158	545	
	Total Issuance	970	1,987	
Tranche Level	Mean	-0.016	-0.002	0.042**
	Median	0	0	0.020**
	Nobs	837	2953	
	Total Issuance	970	1,987	

Table 13: Robustness Tests

The sample period for Panel A is 1991-2009, while for Panel B is 1999-2001. Panel C presents the results when Fitch's ratings are used as the benchmark over the period 1995 to 2005. Panel D restricts the sample to bonds by issuing firms that issued (had outstanding) bonds in both the pre- and post-public periods. Panel E includes industry-year fixed effects. Panel F includes firm fixed effects when the firm issues two or more bond issues. Panel G focuses on a sample of firms with one bond in each period. We estimate Model (1) on the sample of new bond issues, and Model (2) on the sample that includes all outstanding issues. The dependent variables for Model (1) and Model (2) are *RatingDiff* and *LeadTimeDiff*, respectively. *RatingDiff* is the S&P numerical rating minus the Moody's numerical rating. *LeadTimeDiff* is the fraction of a year where Moody's assigns a higher rating minus the fraction of a year where S&P assigns a higher rating. *Post2000Dum* is a dummy variable that takes the value of one for the years in the post-public period, and zero otherwise. Other variables included in the estimation but not displayed are *IssuerSize*, *Leverage*, *OpMargin*,*Stkreststd*, *IssueSize*, *YTM*, and *Seniordum*. The interactions of all variables with the *post2000dum* were also included. All accounting variables are measured in the year prior to the new issue. Heteroscedasticity adjusted robust *p*-values are in parentheses. We cluster standard errors by the issuing firm. ***, **, * represent significance at 1%, 5% and 10% level, respectively.

	Panel A: 9 years around 2000		Panel B: 1 year around 2000		Panel C: Using Fitch as the Benchmark	
	I. New Issues	II. All Issues	I. New Issues	II. All Issues	I. New Issues	II. All Issues
Intercept	-0.251	-0.051	-0.023	-0.162	-1.724	-0.828
	(0.002)***	(0.000)***	(0.931)	(0.000)***	(0.000)***	(0.000)***
post2000Dum	0.178	0.285	0.475	0.114	0.555	0.106
	(0.000) ***	(0.000)***	(0.049)**	(0.000)***	(0.023)**	(0.000)***
	Control variables included but not tabulated					
Adjusted R-square	0.145	0.090	0.092	0.042	0.194	0.117
N	11,697	137,411	1,496	15,827	5,851	32,428
	Panel D: Same Issuing Firms		Panel E: Industry-Year Fixed Effects		Panel F: Firm Fixed Effects	
	I. New Issues	II. All Issues	I. New Issues	II. All Issues	I. New Issues	II. All Issues
Intercept	1.098	-0.074	0.096	-0.079	0.069	-0.335
	(0.035)**	(0.000)***	(0.855)	(0.329)	(0.858)	(0.000)***
post2000Dum	1.028	0.437	0.466	0.221	1.105	0.095
	(0.001)***	(0.000)***	(0.096)*	(0.010)***	(0.008) ***	(0.000)***
	Control variables included but not tabulated					
Adjusted R-square	0.316	0.100	0.343	0.216	0.642	0.489
N	4,705	57,124	8,505	81,641	8,505	81,641

	Panel G: One Bond per Firm	
	I. New Issues	II. All Issues
Intercept	-2.618	0.000
	(0.064)*	(0.999)
post2000Dum	3.062	0.260
	(0.044)**	(0.079)*
Control variables included but not tabulated		
Adjusted R-square	0.001	0.018
N	296	3,586

Table 14: Cross-sectional Tests

This table presents summary statistics for the intercept term estimated in cross-sectional regressions. Panel A (B) reports summary for model estimated at the annual (quarterly) level. The dependent variable is *RatingDiff* for the new issues sample and *LeadTimeDiff* for the all issues sample. We calculate the mean of the estimates of the intercept for the pre-public and the post-public period separately. We conduct tests for the difference in mean and median values from these two periods and report the *p*-values in the table. ***, **, * represent significance at 1%, 5% and 10% level, respectively.

	Panel A: Annually		Panel B: Quarterly	
	New Issues	All Issues	New Issues	All Issues
Pre-public Period				
Mean	0.170	-0.046	0.412	-0.022
Median	0.052	-0.014	0.313	-0.034
Std	0.372	0.073	0.791	0.044
N	5	5	20	20
Post-public Period				
Mean	1.416	0.286	1.395	0.163
Median	1.553	0.356	1.472	0.189
Std	1.104	0.232	1.405	0.234
N	5	5	20	20
Test on difference in Mean				
p-value	0.063*	0.030**	0.032**	0.002***
Test on difference in Median				
p-value	0.060*	0.060*	0.039**	0.004***