DO CORPORATE BOND RATING REVISIONS CONVEY INFORMATION ABOUT EARNINGS AND DIVIDEND CHANGES?

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Abstract

We study the information content of corporate bond rating changes regarding future earnings and dividends. Consistent with previous findings, rating downgrades are associated with negative abnormal stock returns, while rating upgrades appear to be nonevents. For downgrades, earnings decline in the two years prior to and the year of the rating change announcement but increase in the year after the rating review. We also find that rating downgrades are followed by a subsequent downward adjustment in dividends. While rating upgrades follow a period of rising earnings, they do not signal any increase in future earnings and no subsequent dividend adjustments are observed. Overall, our results indicate that rating agencies respond more to permanent changes in cash flows and provide little information, if any, about future cash flows.

Keywords: Rating Revisions, Earnings Information, Dividend Information

JEL Classification: G10, G14

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1 Introduction

Bond rating agencies, such as Moody's and Standard and Poor's, gather and analyze public and nonpublic information to rate corporate bonds. These ratings are often updated to reflect significant changes in a firm's financial and operating performance.[13] Altman and Rijken (2004) suggest that ratings do not adjust instantaneously to new information because they are intended to provide information about the long-term risk profile of the issuer and are typically adjusted when the change in the firm's prospects are likely to be enduring. This implies that when ratings do change they should have significant information value and that this information value should be higher the greater the level of the ratings revision.[14]

Evidence on whether rating revisions provide new information to the market is mixed. Early evidence in Pinches and Singleton (1978) suggests that rating changes are not informative. Subsequent studies, however, have found that information on rating downgrades are associated with significant stock price declines, whereas rating upgrades are essentially nonevents.[15] The market, therefore, seems

[13] Even though it is the debt that is rated by the agency, the ratings themselves reflect the overall risk for the firm.

[14] Rating agencies not only provide a social role in alerting small investors who do not have the resources to screen companies with respect to future performance, but also in performing the important role of being an external monitor. Easterbrook (1985) suggests that agency-ridden managers prefer to stay clear of capital markets to avoid the scrutiny that accompanies the underwriting process, even if it means passing up on potentially profitable investment opportunities. While it is difficult for shareholders to compel managers to be in the market (since information about the value of potential projects is not transparent) and hence be subjected to the monitoring, rating agencies perform this important role, even when managers are able to avoid other forms of monitoring.

[15] See, for example, Griffin and Sanvicente (1982), Holthausen and Leftwich (1986), Davidson et al. (1987), Hand et al. (1992), Barron et al. (1997), and Dichev and Piotroski (2001). Wakeman (1984) suggests that rating agencies do not provide any economic function in re-rating bonds, as they only act

to consider rating revisions, at least downgrades, as newsworthy. Do earnings change following rating changes as the market expects? To our knowledge, with the possible exception of Dichev and Piotroski (2001), the relationship between rating changes and earnings changes has remained mostly unexplored. Furthermore, in a recent study, Aivazian et al. (2006) find that a firm's dividend policy is related to the type of debt (public or private) a firm has. Using a large sample, they find that 67% of the firms with public debt pay dividends, with the percentage rising to 94% for firms with investment grade debt. If firms with higher quality debt are more likely to introduce and maintain a dividend payment policy, changes in the risk of the debt can affect their dividend policy. Bond ratings, therefore, potentially serve an important function in providing information about firms' earnings performance and corporate policy choices, such as dividend policy. We examine the issue of the information content, if any, of bond rating revisions by focusing on earnings and dividend changes around such revisions.

An important question to consider is whether rating changes are precursors to firms' subsequent earnings performance (the cash flow signaling hypothesis) or are a response to past earnings performance (the cash flow permanence hypothesis). The latter argument would suggest that rating revisions are an endorsement of permanent shift in the level of earnings and contain no new information with respect to future earnings. While either way the information is no doubt valuable, investors would certainly place a higher value on rating revisions if they were informative about the future rather than the past. Since firm value is a function of expected future cash flows, inferences drawn from stock price changes around corporate events have often been interpreted vis-à-vis the cash flow signaling hypothesis, which may or may not hold when tested using operating performance analysis. For example, in the case of dividend changes, there is overwhelming evidence that stock prices respond positively to dividend increases and negatively to dividend decreases.[16] However, by analyzing earnings changes, Benartzi et al. (1997) find that empirical evidence is more consistent with Lintner's (1956) suggestion that firms revise their dividends following permanent changes in earnings rather than the signaling role attributed to dividends by Bhattacharya (1979), John and Williams (1985), and Miller and Rock (1985).[17] More recently, Bulan et al. (2007) also report results for IPO firms initiating dividends that are contrary to the signaling theories of dividend policy. One would expect changes in bond ratings to be even more informative compared to dividend changes, since meeting interest obligations is a much more binding contract than maintaining dividends. As Altman and Rijken (2004) note, rating agencies take a more long-term view and, because they are keen on rating stability, they update their ratings only after the difference between the actual agency rating and the rating predicted by the agency-rating model exceeds a certain minimum threshold. Also, in practice, firm performance most likely begins to change, and at some point it reaches a threshold level after which a rating agency acts to change the rating. Performance may continue to change in the year of the rating adjustment or even beyond the year of the revision, thereby giving the impression of confirming both the cash flow permanence and cash flow signaling hypotheses. The two hypotheses are, therefore, not mutually exclusive. Whether rating agencies wait too long to update their ratings and end up endorsing past performance changes or act more proactively and provide information about future performance remains an interesting research question.

The asymmetric stock price response to rating upgrades and downgrades also suggests that the information value vis-à-vis earnings performance in rating reviews varies. Previous evidence from event studies suggest that ratings upgrades are more likely to be consistent with the cash flow permanence hypothesis, particularly if such revisions are preceded by a period of rising earnings. On the other hand, the evidence on ratings downgrades, whether or not preceded by a period of declining earnings, suggests that the rating review itself may signal that poor earnings will persist in the future. Again, prior event study results suggest that both arguments may apply in the context of ratings revisions.

A second interesting question to consider is the association between bond ratings changes and dividend policy changes. As noted above, Aivazian et al. (2006) find that nearly all firms with investment-grade publicly traded debt pay dividends, while two-thirds of all rated firms do so. They also report a dividend payout ratio for rated firms to be 37.5%. Adjusting dividend policy and its timing, depending on how the firm is performing, is definitely within the control of the firm's managers in contrast to earnings and credit ratings. Do managers respond by adjusting their dividend policy following a rating revision? Alternately, if rating agencies are reactive rather than

on publicly available information. However, Ederington et al. (1987) argue that rating changes could provide valuable information to investors, since economies of scale may exist for rating agencies in collecting and evaluating information. Alternatively, firms may provide rating agencies with nonpublic (or insider) information not readily available to outside investors.

[16] See, for example, Aharony and Swary (1980), Asquith and Mullins (1983), Brickley (1983), and Bajaj and Vijh (1990), among others.

[17] Nissim and Ziv (2001) also document that dividend policy adjustments follow "permanent" changes in earnings. Likewise, Miller (1987) also documents that dividends lag earnings rather than lead earnings.

proactive (given their desire to maintain ratings stability), do changes in dividend policy, if any, precede a ratings change? Finally, the asymmetric stock price response to upgrades and downgrades observed in event studies may indicate that any adjustment to dividend policy related to a rating revision is also likely to be different for upgrades and downgrades. Existing evidence would suggest that firms are more likely to respond with an adjustment to their dividend policy after a rating downgrade rather than an upgrade. To answer these questions, we also empirically investigate changes in dividend policy, if any, around bond rating revisions.

Consistent with previous findings (see, for example, Griffin and Sanvicente, 1982; Holthausen and Leftwich, 1986; and Hand et al., 1992), we find a positive relationship between the direction of rating changes and the stock price response around such announcements. This association is greater for rating downgrades than for rating upgrades. For downgrades, we find that the price response has a significant relationship with the earnings change in the year of the announcement. Though a rating downgrade follows a period of declining earnings, we find that earnings increase in subsequent years. For rating upgrades, we find that earnings increase in the year prior to and the year of the upgrade announcement.

Our results also show that dividends decline prior to the rating downgrade and in the following three quarters, whereas there is no discernable trend in dividend changes for ratings upgrades. It is possible that some of the information related to subsequent dividend changes, especially dividend decreases, is incorporated in the announcement of the rating revision itself. If this is the case, subsequent dividend changes should be less informative. We find that the market only partially anticipates subsequent dividend decreases, as reactions to subsequent changes in dividend policy do not evoke a weaker response.[18]

2 Rating revisions, cash flow permanence, and cash flow signalling

Corporate bond ratings are widely used by the investment community as a measure of the riskiness of a bond and are considered very useful, since presumably this information is generated by informed and skilled financial analysts (Kaplan and Urwitz, 1979) and firms may provide rating agencies with nonpublic (insider) information (Ederington et al., 1987). From investors' perspective, rating revisions would no doubt be more valuable if they contained information about subsequent firm performance rather than a confirmation of past performance. Thus, the event of a bond rating change offers a powerful setting to analyze the signaling hypothesis vis-à-vis the cash flow permanence hypothesis, since the information contained in bond rating changes is usually widely disseminated (Dichev and Piotroski, 2001).

Several recent studies question the signaling implications of many corporate events. Two specific events that have been scrutinized more closely in recent years are dividend changes and stock repurchases. Earlier studies by Aharony and Swary (1980) on dividend increases and Dann (1981) on tender offer stock repurchases conclude that the positive stock price response to these events is the result of information signaling. Subsequent studies by Ofer and Siegel (1987) and Denis et al. (1994) on dividend changes and Dann et al. (1991) on stock repurchases find that analysts' revisions of earnings forecasts following these events were consistent with the stock price response at the announcement and conclude that these events signaled future cash flow changes. Healy and Palepu (1988) find a positive association between dividend and earnings changes by examining dividend initiations and omissions.

But do actual cash flow changes following the dividend changes and stock repurchases bear out the implications of the signaling roles assigned to these events? Recent evidence seems to suggest otherwise. Using a large sample of dividend changes, Benartzi et al. (1997) find that dividend increases are preceded by earnings increases, and, if dividends provide any signal of future cash flows, it is that earnings are less likely to fall relative to similar firms with no dividend increases. DeAngelo et al. (1996) also find that dividend increases are unreliable predictors of future earnings because managers tend to be overly optimistic in their projections of future earnings and make only modest cash commitments when they increase dividends. Likewise, Lie and McConnell (1998) show that tender offer stock repurchases are not precursors to increases in operating performance but rather more indicative that earnings are less likely to fall. Guay and Harford (2000) suggest that dividend increases are associated with permanent cash flow changes, whereas stock repurchases are more common for firms experiencing temporary increases in cash flow. Jagannathan et al. (2000) also find that firms with higher permanent operating cash flows tend to pay dividends, while firms with higher temporary nonoperating cash flows tend to favor repurchases. The overwhelming evidence in the more recent studies points to a lack of any information value in dividend changes and stock repurchases, and more and more evidence indicates that such corporate events are a response to permanent changes in firm cash flows.

What happens in the period around bond rating revisions? Are rating revisions preceded or followed

[18] Abnormal returns at dividend announcements are expected to be positively related to unexpected dividend changes (Lang and Litzenberger, 1989). In this case, returns are "normal" relative to abnormal returns for dividend announcements not related to bond rating changes.

by changes in operating performance, or does operating performance change at all? Corporate bond rating revisions are significant events in that they alert investors to the changing risk profile of the firm. In some respect, rating revisions should be even more significant, compared to dividend revisions and stock repurchases, as interest payments on debt are contractual obligations compared to the more implicit commitments in the case of dividends and none in the case of repurchases. Given that credit rating agencies take a long-term perspective when they reevaluate existing ratings and prefer rating stability (Altman and Rijken, 2004), there is likely to be a lag between rating revisions and changes in operating performance, if any.

In an early paper, Pinches and Singleton (1978) find that investors anticipate improving or deteriorating financial and operating conditions well before a rating change, and they conclude that this lagged relationship is because the information content of bond rating changes is relatively small. Subsequently, Griffin and Sanvicente (1982) document negative abnormal returns on the announcement of bond rating downgrades and interpret their results as conveying information regarding firms' future earnings.[19] Holthausen and Leftwich (1986) also find negative returns for downgrades but no abnormal returns around upgrades.[20] Hsueh and Liu (1992) study the impact of rating revisions on "high information firms" (with ownership concentrated among large institutional investors) and "low information firms" (with diverse ownership among individual investors) and conclude that rating changes convey information when the market as a whole is facing a shortage of information. Consistent with prior work, these authors also find negative abnormal returns around downgrades but no abnormal returns around upgrades.[21]

Altman and Koa (1992) and Dichev and Piotroski (2001) find serial autocorrelation in bond ratings, particularly for rating downgrades. Thus, a rating revision is likely to be followed with another change in the same direction. The serial autocorrelation in rating changes also emphasizes the idea that rating downgrades signal bad news about the firms' future prospects. Dichev and Piotroski (2001) provide evidence consistent with this notion by documenting negative long-run abnormal returns following a rating downgrade. Using the return on equity (ROE) as a measure of profitability, they find that upgraded firms show improved profitability, while downgraded firms' profitability worsens in the year following a ratings change. These results, combined with the previous finding of Kaplan and Urwitz (1979), who document that profitability of assets is a significant predictor of bond ratings, imply that rating changes and earnings changes are likely to be correlated.

Recent work also suggests that there is a link between the type of debt (public or private) and dividend policy. Aivazian et al. (2006) document that 67% of firms with bond ratings adopt a dividend policy and the chances that a firm will pursue a dividend policy increases with the quality of the outstanding public debt. Thus, when ratings are revised, they are also likely to influence the dividend policy of the firm. Based on existing evidence, a downgrade is a more significant event and is more likely to affect the dividend policy.

Whereas previous work on rating revisions has been interpreted mostly in the context of information signaling, recent empirical work on corporate events, such as dividend changes and stock repurchases, suggests that many of these events are driven more by permanent or temporary changes in cash flows, both past and contemporary, and tell us little, if anything, about future earnings performance. With the dual objective of maintaining ratings stability as well as a long-term perspective, credit rating agencies may well be either confirming past earnings changes or signaling future earnings performance. The asymmetric price response to upgrades and downgrades suggests that both explanations may apply, depending on the direction of the change. Furthermore, the rating agency in all likelihood acts after performance has changed for some time, but this

[19] They also find that stock prices change when a firm is placed on the Standard and Poor's "credit watch" list. A credit watch listing highlights the potential for a near-term change in the credit rating. It signals to investors that further analysis is being performed by the rating agency (Standard and Poor's, 2005).

[20] Similar results are also obtained by Davidson et al. (1987) and Hand et al. (1992). Holthausen and Leftwich also find that significant abnormal returns are associated with announcements of additions to the Standard and Poor's credit watch list, with either a potential downgrade or upgrade indication. For firms placed on the credit watch list, much of the information regarding a future rating change is disseminated at the time of the credit watch placement rather than at the actual rating change announcement. Therefore, for firms placed on the credit watch list, the stock price reaction to the actual rating change is not expected to be as large as the reaction of firms whose bonds are not placed on the credit watch list.

[21] It is quite possible that a rating downgrade does not always signal "bad news" to investors. In the case of a leverage change, it may be that a rating downgrade provides good news to stockholders, as wealth is expropriated at the expense of bondholders (the incentive effect discussed in Jensen and Meckling, 1976). Goh and Ederington (1993) examine this issue by separating rating changes into groups based on whether or not they have positive or negative implications for stockholders. They find that downgrades associated with deteriorating financial prospects for a firm convey new negative information, whereas downgrades due to leverage changes do not.

adjustment may occur while performance is still changing. This may result in performance continuing to change after the rating change has been made, thereby providing evidence that confirms both the cash flow signaling and cash flow permanence hypotheses. Whether or not credit rating agencies are driving bond ratings updates looking ahead or in the "rear view" mirror remains an interesting research question. Also, since the presence and quality of outstanding public debt has been shown to influence corporate dividend policy, a rating revision is also likely to be either preceded or followed by a change in dividend policy. We empirically examine both these issues.

3 Bond ratings and data description

Moody's and Standard and Poor's are the two major providers of credit ratings for corporate bond issues. There is a very high degree of correlation between the rating categories used by the two agencies. In this study, we use the credit rating updates as provided by Moody's. The highest rating assigned by Moody's is Aaa and bonds with this rating are considered highly creditworthy, with an extremely low probability of future default. The next best rating is Aa, followed by A, Baa, Ba, B, Caa, Ca, C and D. To create finer rating categories, Moody's divides its Aa category, for example, into Aa1, Aa2, and Aa3, and so on. Ratings in the Aaa to Baa categories are regarded as investment grade, while ratings in the Ba to C categories are regarded as having significant speculative characteristics. Standard and Poor's use a similar ratings system.

Analysts and commentators often use ratings as descriptors of the creditworthiness of bond issuers rather than as descriptors of the quality of the bonds themselves (Hull et al., 2004). This is reasonable, given that it is rare for two different bonds issued by the same firm to have different ratings. Indeed, when rating agencies announce rating changes, they often refer to issuers and not individual bond issues.

Our initial sample consists of 1,423 rating changes announced by Moody's between 1990 and 2001, which include 890 rating downgrades and 533 rating upgrades.[22] Daily stock and market returns data for 260 days prior to until 20 days following the rating changes were obtained from the Center for Research in Security Prices (CRSP) database. Annual earnings data from five years before to five years after the ratings change were obtained from the Compustat Annual Industrial and Research (Compustat) database. Year 0 is defined as the fiscal year-end of the year in which the rating change announcement occurred. Firms were eliminated from the sample if they did not appear on Compustat, if they did not have earnings data (Compustat data item DATA18) available in years 0 and +1, or if they did not have data on stock prices (Compustat data item DATA24) or the number of shares outstanding (Compustat data item DATA25) available in year -1. Missing data reduced the final sample size to 1,233 observations, which include 766 rating downgrades and 467 rating upgrades. Table 1 provides information on the sample analyzed in this paper. Panel A shows the distribution by year. Consistently for each year, the number of downgraded firms is more than the number of upgraded firms. The largest number of downgrades is in 2001, while the largest number of upgrades is in 1994. Nearly half of the sample (47%) is from years 1998 to 2001, largely because there is more information available for later years in the sample period compared to the earlier period in the database. Panel B shows that 38% of the firms belong to the manufacturing sector and this sector is the largest for both the upgraded and downgraded firms, followed by finance and real estate and transportation sectors. All major sectors of the economy are represented well in the sample. The distribution of the sample in table 1 shows that clustering by industry or time is not a concern.

A smaller sample is used for the estimation of dividend changes, as not all firms in the sample pay dividends. Firms are excluded if they do not pay dividends in quarters 0, +1, and +2 relative to the quarter of the rating change announcement, defined as quarter 0. This subsample consists of 628 firms and includes 335 rating downgrades and 293 rating upgrades. Dividend amounts and declaration dates are obtained from the CRSP database.

The analyses are undertaken for the full sample of upgrades and downgrades and the following subsamples: (i) firms whose ratings changed by more than one category, (ii) firms whose ratings changed by only one category, and (iii) firms whose ratings changed from non-investment to investment grade (for upgrades) and vice versa (for downgrades). Univariate results are presented and discussed for the full sample and the different subsamples. For brevity, multivariate regression results are presented and discussed for the full sample only.[23]

[22] There is a potential for the data to be confounded by rating changes announced by Standard and Poor's that do not coincide with rating changes announced by Moody's. In this context, Griffin and Sanvicente (1982) find that in their sample of 180 firms that had their bond ratings updated, only 32 ratings were changed by both rating agencies. Of these, 10 firms' ratings were changed on the same date, 18 firms' ratings were changed first by Moody's, and only 4 ratings were changed first by Standard and Poor's. Thus, we expect rating changes announced by Standard and Poor's, if they occurred prior to Moody's announcements, to have a minimal confounding effect on our sample.

[23] The subsample results for the multivariate regressions are available from the authors upon request.

Table 1. Distribution of the sample of corporate bond rating changes by year and industry

Panel A in the table provides the distribution by year of the 467 corporate bond ratings upgrades and 766 downgrades between 1990 and 2001 used in this study. Panel B provides a distribution by the major industry groupings for the sample firms. Corporate bond ratings changes studied in this paper are Moody's bond ratings.

Panel A: Distribution by year

Year	Upgraded firms	Downgraded firms	Total	Percent of the sample
1990	20	65	85	6.89%
1991	19	38	57	4.62%
1992	23	21	44	3.57%
1993	36	35	71	5.76%
1994	54	33	87	7.06%
1995	40	46	86	6.97%
1996	75	42	117	9.49%
1997	47	47	94	7.62%
1998	51	75	126	10.22%
1999	38	95	133	10.79%
2000	41	119	160	12.98%
2001	23	150	173	14.03%
Total	467	766	1,233	100.00%

Panel B: Distribution by industry

Industry	Upgraded firms	Downgraded firms	Total	Percent of the sample
Resources, mining and construction	38	59	97	7.87%
Manufacturing, food and chemicals	166	302	468	37.96%
Transportation	84	98	182	14.76%
Wholesale and retail trade	58	103	161	13.06%
Finance and real estate	96	131	227	18.41%
Services (hotels, entertainment, etc.)	25	73	98	7.95%
Total	467	766	1,233	100.00%

4 Methodology and empirical results[24]

4.1 Stock price reaction to the rating change announcement

We first examine the abnormal stock returns over an event period starting 60 days prior to and ending 20 days after the announcement day for the rating change. Abnormal returns are computed in two ways. First, we employ the standard market model to estimate the model's parameters over days -260 to -61, where day 0 is the announcement date (see MacKinlay, 1997). Holthausen and Leftwich (1986), among others, report abnormal returns in the period up to 300 days prior to a bond rating change. Hence, the estimated beta and intercept coefficients for the market model may not reflect the "true" beta, resulting in biased results. To minimize this bias, the abnormal returns are also computed using the market-adjusted method, where the market-adjusted returns are computed as the difference between a firm's stock return and the return on the CRSP value-weighted market portfolio. We use the method described in Patell (1976) to test for the statistical significance of the cumulative average abnormal returns (CARs) for the different event windows.

Table 2 shows the CARs using the market-adjusted model.[25] While the period of particular interest is days (-1, +1) surrounding the bond rating change announcement, we also report the CARs for the 60 days prior to and the 20 days following the ratings announcement. Panels A and B display the results for rating upgrades and downgrades, respectively.

[24] The methodology used in this study, in part, draws on Healy and Palepu (1988, pp. 156-169) and is adapted to suit this study.

[25] Event study results for downgrades using both the market-adjusted model and the market model are qualitatively similar for all windows. For upgrades, however, while the results are similar for windows of interest [days (-1, +1) and (-1, 0)], no significant results are observed for the longer windows preceding the announcement and negative returns are observed for the post-announcement period with the market model. The parameter estimates for the market model may not reflect the "true" beta and intercept, resulting in biased results (see Holthausen and Leftwich, 1986). It is reassuring, however, that the results are consistent using both methods for the shorter windows. We therefore report and discuss the results using only the market-adjusted model and use these in our cross-sectional analyses. The results for the market model are available from the authors upon request.

Table 2. Event study results of corporate bond rating upgrades and downgrades between 1990 and 2001

This table presents the cumulative abnormal returns around the announcement of the bond rating changes. The event study methodology used in this study is adapted from Patell (1976). Stock return data are obtained from the CRSP Daily Stock Return database. The value-weighted index on the CRSP database is used as the proxy for the market portfolio. Statistical significance tests for the mean CARs for the different event windows reported in the table use parametric tests.

Panel A: Market-adjusted cumulative abnormal returns for rating upgrades

Days relative to the event day	All rating upgrades (N = 486)		Rating changed by more than one category (N = 88)		Rating upgraded to the next immediate category(N = 398)		Upgrade from non-investment to investment grade (N = 60)	
	Mean	*t*-statistic	Mean	*t*-statistic	Mean	*t*-statistic	Mean	*t*-statistic
-61 to -21	0.0344***	5.20	0.0373*	1.82	0.0357***	5.04	0.0396**	2.14
-20 to -11	0.0066*	1.87	0.0142	1.40	0.0050	1.34	0.0032	0.39
-10 to -2	0.0093***	2.92	0.0179**	2.01	0.0074**	2.21	0.0056	0.84
-1 to +1	0.0024	1.09	0.0084	1.20	0.0011	0.50	0.0058	0.76
-1 to 0	0.0020	1.01	0.0078	1.21	0.0007	0.36	0.0076	0.91
+2 to +10	0.0018	0.58	0.0114	1.44	-0.0004	-0.11	0.0111	1.22
+11 to +20	0.0014	0.41	-0.0010	-0.13	0.0019	0.52	-0.0134*	-1.76

Panel B: Market-adjusted cumulative abnormal returns for rating downgrades

Days relative to the event day	All rating downgrades (N = 828)		Rating changed by more than one category (N = 282)		Rating downgraded to the next immediate category(N = 546)		Downgrade from investment to non-investment grade (N = 75)	
	Mean	*t*-statistic	Mean	*t*-statistic	Mean	*t*-statistic	Mean	*t*-statistic
-61 to -21	-0.0881***	-9.14	-0.1295***	-6.93	-0.0669***	-6.14	-0.0808***	-3.06
-20 to -11	-0.0262***	-4.53	-0.0417***	-3.62	-0.0181***	-2.83	-0.0192	-1.54
-10 to -2	-0.0471***	-7.26	-0.0869***	-6.86	-0.0265***	-3.79	-0.0313*	-1.66
-1 to +1	-0.0386***	-7.57	-0.0726***	-6.43	-0.0211***	-4.28	-0.0502**	-2.55
-1 to 0	-0.0277***	-6.21	-0.0534***	-5.31	-0.0145***	-3.41	-0.0318**	-2.24
+2 to +10	-0.0003	-0.04	0.0233	1.32	-0.0125*	-1.83	0.0206	0.95
+11 to +20	0.0128**	1.96	0.0118	0.76	0.0133**	2.27	0.0100	0.78

***, **, * Indicates significance at the 1%, 5%, and 10% level, respectively

Consistent with previous findings, the CARs for upgrades are not significant around the announcement date (panel A). However, the CARs are positive and significant for the period preceding the announcement for the full sample and the subsamples, suggesting that the market anticipates the upgrade announcement. For example, for all upgrades, significant CARs of 3.44%, 0.66%, and 0.93% are observed for the (-61, -21), (-20, -11), and (+10, -2) windows, respectively. The CARs for the post-event period are again not statistically significant.

For the downgrades in panel B, CARs of -3.86% and -2.77% are observed for the (-1, +1) and (-1, 0) windows, respectively. Similar results hold for all subsamples. The CARs are, however, more negative when the downgrade is over more than one category and when the rating changes from an investment to non-investment grade compared to when the rating changes to the next lower category. Altman and Rijken (2004) suggest that rating agencies do not adjust the ratings soon in the interest of maintaining ratings stability. Our results suggest that when ratings are adjusted substantially, they tend to contain more information, as a significant adjustment is less likely and less anticipated compared to a smaller adjustment. We also observe significant negative CARs for the full sample and all subsamples leading up to the announcement. Thus, like Holthausen and Leftwich (1986), overall the negative returns suggest that rating downgrades either provide information to capital markets or impose significant costs on the affected firms. There is some evidence to suggest that the market may be overreacting to a downgrade announcement, as indicated by the reversal in the CARs in the post-announcement period.

Overall, the event study results are consistent with prior work and indicate that investors recognize the declining or improving financial position of firms well before ratings changes are revealed to the market. These initial results also seem to suggest that ratings upgrades are more likely to be consistent with the cash flow permanence hypothesis, while ratings downgrades are likely to be consistent with both the cash flow permanence and cash flow signaling hypotheses. We formally test these hypotheses next.

4.2 Earnings changes surrounding bond rating changes

We examine earnings changes before the rating change over years -4 to -1, the year of the rating change (i.e., year 0), and years +1 to +5 following the rating change. To aggregate results across firms, earnings changes were expressed as a percentage of market capitalization of the stock at the fiscal year-end prior to the announcement of the change, MV_i.[26] Thus, the standardized change in earnings for firm *i* in year *t*, ΔE_{it}, is defined as:

$$\Delta E_{it} = (E_{it} - E_{it-1}) / MV_i, \quad (1)$$

where E_{it} is earnings before extraordinary items (Compustat data item DATA18) for firm *i* in year *t*.

Abnormal earnings are computed using the random-walk model, suggested in Ball and Brown (1968), in which average earnings changes for a random sample of firms are expected to be zero.

If rating agencies respond to permanent shifts in earnings levels but are not indicative of future performance, we should expect to observe an increasing (decreasing) trend in earnings in the years preceding the rating upgrade (downgrade). Cash flow signaling, on the other hand, would suggest earnings changes in the post-event period in the direction of the rating change. The results for annual earnings changes for the 10-year period surrounding the rating change are reported in table 3.

Earnings increase in the year prior to and the year of the rating upgrade. There is, however, no change in earnings in the post-announcement period. For firms whose ratings changed by more than one category, the positive earnings change is observed only in the year of the announcement, while for firms whose ratings moved from non-investment to investment grade, no significant change in earnings is observed. One would have considered this latter subgroup to display even stronger changes in earnings.[27] However, the non-significant earnings changes for this subgroup are consistent with the corresponding results from the event study in table 2. Overall, for upgrades, the results seem to suggest that rating agencies update their rating after earnings have increased "permanently." Both the event study results reported in table 2 and the earnings changes reported in table 3 for rating upgrades are consistent with the cash flow permanence hypothesis. There is no evidence in either the event study results or the earnings changes to suggest that rating upgrades are signals of future earnings performance.

[26] The stock's market capitalization is calculated as the number of shares outstanding multiplied by the closing price of the stock at fiscal year-end prior to the year in which the rating change was announced (Compustat data item DATA24 multiplied by data item DATA25).

[27] Of the 54 firms whose ratings moved from non-investment to investment grade, 24 firms had ratings upgraded by more than one category. The mean earnings change for these 24 firms for year 0 was 0.0659 significant at the 10% level (*t*-statistic = 1.64). For the remaining 30 firms whose ratings moved only one category, the earnings change was not significant.

Table 3. Mean annual earnings changes before and after corporate bond rating changes

This table presents the summary statistics on changes in earnings before extraordinary items for firms that had their bond ratings changed between 1990 and 2001. Annual earnings data are obtained from the Compustat database. The standardized change in annual earnings for firm *i* in year *t*, ΔE_{it}, is defined as $\Delta E_{it} = (E_{it} - E_{it-1})/MV_{it}$, where E_{it} is the earnings before extraordinary items, and MV_{it} is the firm's market capitalization in the fiscal year ending prior to the rating change. Year 0 is the first fiscal year of the ratings change announcement. Mean earnings changes are tested using the *t*-statistic. Number of observations and absolute *t*-statistics are reported in parentheses (*N*; *t*-statistic).

	Rating upgrades				Rating downgrades			
Year relative to bond rating change	All rating upgrades	Rating changed by more than one category	Rating upgraded to the next immediate category	Upgraded from non-investment to investment grade	All rating downgrades	Rating changed by more than one category	Rating downgraded to the next category	Downgraded from investment to non-investment grade
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
-4	0.0573	0.2917	0.0141	-0.0021	-0.0388	-0.1667	0.0178	0.0142
	(424; 1.12)	(66; 0.97)	(358; 0.58)	(52; 0.20)	(707; 1.01)	(217; 1.42)	(490; 0.99)	(66; 1.32)
-3	-0.0123	-0.0443	-0.0064	0.0068	0.0167	0.0243	0.0133	-0.0020
	(443; 1.34)	(69; 1.46)	(374; 0.68)	(52; 0.59)	(733; 0.48)	(224; 0.22)	(509; 1.22)	(67; 0.19)
-2	-0.0061	-0.0128	-0.0049	-0.0068	-0.1092***	-0.2123**	-0.0629***	-0.0184
	(457; 0.47)	(71; 0.44)	(386; 0.34)	(53; 0.58)	(751; 3.51)	(233; 2.33)	(518; 3.11)	(69; 1.31)
-1	0.0313**	-0.0019	0.0375***	0.0051	-0.2937***	-0.5311***	-0.1911***	-0.0996***
	(466; 2.47)	(74; 0.05)	(392; 2.77)	(54; 0.31)	(756; 7.61)	(228; 5.94)	(528; 4.93)	(70; 3.39)
0	0.0481***	0.1066**	0.0371**	0.0287	-0.1928***	-0.2954**	-0.1485***	-0.0848**
	(465; 3.31)	(73; 2.40)	(392; 2.47)	(54; 1.43)	(754; 3.91)	(227; 2.41)	(527; 3.17)	(70; 2.28)
+1	-0.0220	-0.1226	-0.0023	-0.0020	0.2897***	0.6461***	0.1356***	0.0098
	(433; 1.00)	(71; 0.99)	(362; 0.23)	(51; 0.18)	(699; 4.40)	(211; 3.41)	(488; 3.01)	(66; 0.25)
+2	-0.0045	-0.0116	-0.0030	-0.0347	0.0348	0.0476	0.0296	0.0385
	(400; 0.35)	(70; 0.56)	(330; 0.20)	(49; 1.64)	(639; 0.74)	(185; 0.35)	(454; 0.82)	(63; 1.15)
+3	0.0173	-0.0130	0.0239	0.0676**	0.0091	0.0260	0.0027	0.0455
	(371; 1.12)	(66; 0.38)	(305; 1.38)	(45; 2.25)	(569; 0.34)	(158; 0.30)	(411; 0.15)	(54; 1.15)
+4	0.0237	0.0150	0.0255	-0.0070	0.0260	0.0261	0.0260	-0.0273
	(333; 1.36)	(57; 0.37)	(276; 1.32)	(41; 0.35)	(425; 1.44)	(108; 0.51)	(317; 1.46)	(35; 0.70)
+5	-0.0038	0.0246	-0.0096	-0.0092	0.0108	0.0904***	-0.0142	-0.0145
	(288; 0.21)	(49; 0.74)	(239; 0.46)	(34; 0.30)	(310; 0.58)	(74; 3.09)	(236; 0.63)	(24; 0.20)

***, **, * Indicates significance at the 1%, 5%, and 10% level, respectively

For the rating downgrades sample, earnings changes are negative and significant in years -2, -1, and 0 relative to the rating change year. However, contrary to expectations, there is an earnings reversal in year +1. These results are robustly consistent across all subsamples and all downgrades and are mostly significant at the less than 1% level. The evidence again points to the fact that rating agencies wait "too long" to update the bond ratings, and, from the investors' perspective, while the information is no doubt valuable, it provides no guidance with respect to future earnings performance. It is, however, consistent with the longer-term perspective of these agencies and their interest in maintaining ratings stability (Altman and Rijken, 2004).[28]

In the case of both upgrades and downgrades, rating agencies appear to respond to permanent shifts in earnings rather than signal future earnings changes. The earnings increase in year +1 following a downgrade, however, presents a puzzle. One possible explanation is the "big bath" theory suggested by Nissim and Ziv (2001), among others. That is, managers may choose to write off assets or announce costly restructuring in a fiscal year in which bad news is already being delivered to the market, with the expectation that, by doing this, they can put the poor-performing period behind them. Therefore, rather than rating downgrades signaling bad news in the future, they may signal that the poor-performing period is coming to an end.[29] The lack of any earnings changes in years beyond the first year for the downgrade sample appears to provide support for the "big bath" explanation.

4.3 Dividend changes surrounding bond rating changes

As Aivazian et al. (2006) show, there is a relationship between a firm's debt quality and its dividend policy. In general, firms with higher quality debt often have a more robust dividend policy. As noted previously, debt contracts are more binding than dividend commitments. Furthermore, dividend policy is one choice within management's control. Thus, for example, if a downgrade signals deteriorating future earnings, to preserve cash flow a firm's management may respond by reducing the firm's regular dividend payments. However, if the evidence in the previous section on annual earnings changes is any guide, it is very likely that firms may have already made suitable adjustments to their dividends before the ratings review announcement. We now turn our attention to investigating whether firms respond to rating revisions by adjusting their payout policy.

Both quarterly and annualized dividend changes are computed for firm *i* in period *t* as:

$$\Delta D_{it} = (D_{it} - D_{it-1}) / P_i, \qquad (2)$$

where P_i is the price per share at the fiscal year ending prior to the ratings change announcement;

D_{it} is the quarterly dividend per share. When calculating annualized dividend changes, D_{it} is the sum of four quarterly dividends.[30]

Abnormal dividends are computed using the random-walk model suggested in Ball and Brown (1968).

The mean abnormal dividends are tested to see if they are significantly different from zero. The cash flow signaling hypothesis would predict a positive relationship between the direction of firms' rating changes and future dividend changes, whereas the cash flow permanence hypothesis would predict no relationship between the direction of the ratings change and future dividend changes. These hypothesized relationships are based on the positive relationship between earnings and dividend changes widely reported in the literature (Healy and Palepu, 1988; Benartzi et al., 1997; and Nissim and Ziv, 2001).

Changes in annualized dividends over years 0 to +2 are reported in table 4. For the full sample of upgrades, we do not observe any change in dividends following rating changes, which is consistent with the evidence reported in table 3 for earnings changes. However, for years +1 and +2, dividend changes are positive and significant at the 5% and 10% levels, respectively, for firms whose ratings moved by more than one category. They are also significantly positive for year +2 for firms whose ratings changed from non-investment to investment grade.

[28] We repeated the analysis by using only the very first rating update (only one observation per firm) and also using the sample of firms that experienced only one rating update in the entire sample period, 1990 to 2001. Of the 344 unique firms in the upgrade sample, 255 had one rating change, 66 had two changes, 15 had three changes, and 8 had four or more changes. For the 466 unique firms in the downgrade sample, 284 had one rating change, 109 had two changes, 51 had three changes, and 22 had four or more changes. Our results on earnings changes continue to robustly hold for these subsamples. These results are available from the authors upon request.

[29] Such results could also occur in the presence of a survivorship bias. Healy and Palepu (1988) report a similar earnings reversal for a sample of dividend omissions, another "bad news" event.

[30] For example, the annualized dividend D_{i0} is the sum of the four quarterly dividend payments in the fiscal year of the rating change announcement.

Table 4. Mean annual dividend changes following corporate bond rating changes

This table presents the summary statistics on changes in annual dividends for firms that had their bond ratings changed between 1990 and 2001. Annual dividends data are obtained from the Compustat database. The standardized change in dividends for firm *i* in year *t*, ΔD_{it}, is defined as $\Delta D_{it} = (D_{it} - D_{it-1})/P_{it}$, where D_{it} is the sum of quarterly or semi-annual dividends per share, and P_{it} is the firm's stock price at the fiscal year ending prior to the ratings change. Year 0 is the fiscal year of the ratings change announcement. The *t*-statistic tests the null hypothesis that mean annual dividend changes are equal to zero. Number of observations and absolute *t*-statistics are reported in parentheses (*N*; *t*-statistic).

	Rating upgrades				Rating downgrades			
Year relative to bond rating change	All rating upgrades	Rating changed by more than one category	Rating upgraded to the next immediate category	Upgraded from non-investment to investment grade	All rating downgrades	Rating changed by more than one category	Rating downgraded to the next category	Downgraded from investment to non-investment grade
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
0	-0.0008	-0.0039	-0.0004	-0.0016	-0.0091***	-0.0101***	-0.0088***	-0.0112***
	(249; 1.22)	(29; 1.05)	(220; 0.72)	(27; 0.63)	(310; 5.49)	(64; 4.03)	(246; 4.44)	(38; 4.15)
+1	0.0005	0.0023**	0.0002	-0.0001	-0.0018***	-0.0016**	-0.0019***	-0.0028**
	(244; 1.14)	(34; 2.01)	(210; 0.42)	(27; 0.03)	(287; 3.79)	(61; 2.07)	(226; 3.28)	(35; 2.52)
+2	0.0003	0.0018*	0.0000	0.0020**	-0.0002	-0.0011	0.0001	0.0015
	(213; 0.62)	(30; 1.87)	(183; 0.04)	(22; 2.13)	(261; 0.31)	(55; 1.16)	(206; 0.18)	(30; 0.94)

***, **, * Indicates significance at the 1%, 5%, and 10% level, respectively

Thus, while for the small number of firms, substantial improvements in ratings are followed by positive dividend changes, for the vast majority of firms whose rating was upgraded only to the next category, no changes in dividends are observed. For firms with ratings downgrades, dividends decrease significantly in year 0 and +1 following the downgrade. This result is robust for the full sample of downgrades and all subgroups. Whereas ex post we find no negative change in earnings following ratings downgrades (see table 3), firms' management appear to act conservatively to preserve cash flow by reducing dividend payments presumably to ensure that they meet future debt obligations. Taken together, the evidence in tables 3 and 4 is consistent with Benartzi et al. (1997), who also show that dividend changes follow earnings changes rather than the other way around.

We repeat the analysis by computing quarterly dividend changes from quarters -3 to quarter +11 to examine more closely when the dividend policy changes occur. These results are reported in table 5. For upgrades, no change in dividends is observed except for some limited evidence for firms whose ratings changed from non-investment to investment grade. For all downgrades, on the other hand, dividends decrease significantly from quarter -3 through to quarter +3, which is largely driven by the subgroup whose ratings dropped by one category.

To recap, the evidence in tables 3, 4, and 5 is mostly consistent with the cash flow permanence hypothesis rather than the signaling hypothesis. As noted previously, credit rating agencies often aim to strike a balance between the timeliness of their rating revisions, rating stability, and their longer-term perspective when they revise a rating. They are also aware of the potential impact of their rating reviews and act cautiously before making a change, whether it is an upgrade or a downgrade. The evidence, so far, suggests that rating agencies act cautiously by endorsing "permanent" changes in cash flow rather than proactively providing information on future firm performance. One may argue that the dividend decreases in the three quarters following the downgrade lends some support for the cash flow signaling hypothesis, since it is consistent with the negative stock price response around the announcement date. However, the lack of any earnings changes following rating downgrades does not support this argument. Next, we formally test the cash flow permanence and cash flow signaling hypotheses using cross-sectional regression analysis.

4.4 Logistic regression analysis

One approach to testing both the cash flow permanence and cash flow signaling hypotheses simultaneously is to employ logistic regressions using both lagged and leading earnings and dividend measures as well as other control variables. If the cash flow permanence hypothesis is the more relevant explanation to our earlier findings than the signaling hypothesis, then the coefficients associated with the lagged earnings and dividends would be more significant than the coefficients associated with the respective leading variables. We employ these regressions for the upgrade and downgrade samples separately, and the results are reported in table 6.

Table 5. Mean quarterly dividend changes before and after corporate bond rating changes

This table presents the summary statistics on changes in quarterly dividends for firms that had their bond ratings changed between 1990 and 2001. Quarterly dividends data are obtained from the Compustat database. The standardized change in quarterly dividends for firm *i* in year *t*, ΔD_{it}, is defined as $\Delta D_{it} = (D_{it} - D_{it-1})/P_{it}$, where D_{it} is the quarterly dividend per share, and P_{it} is the firm's stock price at the fiscal year ending prior to the ratings change. Quarter 0 is the quarter in which the ratings change is announced. The *t*-statistic tests the null hypothesis that mean quarterly dividend changes are equal to zero. Number of observations and absolute *t*-statistics are reported in parentheses (*N*; *t*-statistic).

	Rating upgrades				Rating downgrades			
Quarter relative to bond rating change	All rating upgrades	Rating changed by more than one category	Rating upgraded to the next immediate category	Upgraded from non-investment to investment grade	All rating downgrades	Rating changed by more than one category	Rating downgraded to the next category	Downgraded from investment to non-investment grade
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
-3	-0.0001	0.0000	-0.0001	-0.0001	-0.0001*	-0.0003	-0.0001	0.0000
	(253; 1.38)	(29; 0.91)	(224; 1.33)	(28; 0.89)	(319; 1.74)	(66; 1.44)	(253; 1.11)	(39; 1.11)
-2	-0.0001	-0.0010	0.0000	0.0001	-0.0005**	-0.0007*	-0.0005*	-0.0004*
	(259; 0.83)	(32; 1.25)	(227; 0.77)	(29; 1.51)	(327; 2.48)	(67; 1.86)	(260; 1.92)	(40; 1.71)
-1	0.0000	-0.0005	0.0001	0.0002*	-0.0009***	-0.0010**	-0.0009***	-0.0004
	(262; 0.08)	(32; 1.00)	(230; 1.14)	(29; 1.81)	(328; 3.43)	(67; 2.28)	(261; 2.81)	(40; 1.19)
0	-0.0001	0.0001	-0.0001	0.0000	-0.0008***	-0.0007***	-0.0009***	-0.0009**
	(264; 0.60)	(32; 0.35)	(232; 0.73)	(29; 0.19)	(330; 5.14)	(67; 2.71)	(262; 4.47)	(40; 2.11)
+1	-0.0001	-0.0001	-0.0001	-0.0006	-0.0004***	-0.0005*	-0.0004***	-0.0015**
	(293; 1.08)	(38; 0.88)	(255; 0.91)	(32; 1.10)	(335; 3.33)	(70; 1.94)	(265; 2.76)	(42; 2.34)
+2	0.0001	0.0002	0.0001	0.0003***	-0.0003***	-0.0002	-0.0003***	-0.0001
	(293; 1.25)	(38; 1.29)	(255; 0.90)	(32; 2.71)	(335; 2.82)	(70; 1.03)	(265; 2.62)	(42; 0.78)
+3	-0.0001	0.0000	-0.0001	-0.0006	-0.0002**	0.0000	-0.0003***	-0.0002*
	(289; 0.62)	(38; 0.14)	(251; 0.60)	(31; 1.25)	(323; 2.52)	(68; 0.61)	(255; 2.60)	(41; 1.76)
+4	0.0002***	0.0003*	0.0001**	0.0003*	0.0000	0.0001	0.0000	0.0001
	(279; 2.70)	(38; 1.87)	(241; 2.19)	(30; 1.93)	(317; 0.09)	(67; 1.47)	(250; 0.65)	(41; 1.16)
+5	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(269; 0.23)	(38; 0.59)	(231; 0.51)	(30; 0.32)	(303; 0.65)	(64; 0.35)	(239; 0.58)	(37; 0.88)
+6	0.0000	0.0003*	0.0000	0.0002	-0.0001	-0.0004	0.0000	-0.0002
	(254; 0.14)	(35; 1.87)	(219; 0.52)	(27; 0.90)	(294; 1.22)	(62; 1.50)	(232; 0.11)	(36; 0.62)
+7	0.0001	0.0000	0.0001*	-0.0001	0.0000	0.0000	0.0000	-0.0001
	(244; 1.47)	(34; 0.14)	(210; 1.76)	(27; 0.31)	(287; 0.02)	(61; 0.28)	(226; 0.08)	(35; 0.31)

Table 5 (continued)

Quarter relative to bond rating change	Rating upgrades				Rating downgrades			
	All rating upgrades	Rating changed by more than one category	Rating upgraded to the next immediate category	Upgraded from non-investment to investment grade	All rating downgrades	Rating changed by more than one category	Rating downgraded to the next category	Downgraded from investment to non-investment grade
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
+8	0.0001	0.0002	0.0000	0.0007	-0.0001	-0.0002	0.0000	0.0001
	(239; 0.68)	(33; 1.43)	(206; 0.40)	(26; 1.09)	(280; 0.64)	(59; 1.17)	(221; 0.30)	(34; 1.00)
+9	-0.0001	0.0001	-0.0001	-0.0004	0.0000	0.0000	0.0000	0.0002
	(233; 1.31)	(33; 0.71)	(200; 1.49)	(26; 0.75)	(273; 0.49)	(58; 0.54)	(215; 0.66)	(33; 1.51)
+10	0.0000	0.0000	0.0000	0.0002	0.0001**	0.0001**	0.0001*	0.0003
	(217; 0.05)	(31; 0.01)	(186; 0.05)	(22; 1.36)	(267; 2.29)	(58; 2.26)	(209; 1.88)	(32; 1.17)
+11	0.0001	-0.0002	0.0001**	-0.0004	0.0001	0.0001	0.0001	0.0003*
	(213; 0.90)	(30; 0.47)	(183; 2.03)	(22; 0.75)	(261; 1.43)	(55; 0.62)	(206; 1.30)	(30; 1.72)

***, **, * Indicates significance at the 1%, 5%, and 10% level, respectively

Table 6. Logistic regression results for rating upgrades and downgrades

This table presents the results for logistic regressions to jointly test for the cash flow permanence and cash flow signaling hypotheses. In models 1 and 2, the dependent variable is 1 if the firm experiences a rating upgrade or downgrade, respectively, and 0 otherwise, where the set of firms with no rating change includes all firms with outstanding long-term debt on Compustat during the sample period 1990 to 2001. In models 3 and 4, a matched sample of firms with outstanding long-term debt and no rating change is used, where the matched firm is selected on the basis of industry and firm size. Variable definitions are as follows: ΔEARN_*t* (*t* = 1, 2, 3) is the change in earnings between year *t-1* and *t* prior to the rating change; ΔEARN*t* (*t* = 0, 1, 2) is the change in earnings between year *t-1* and *t* after the rating change; EARN_*t* (*t* = 1, 2, 3, 4) is the earnings in year *t* prior to the rating change; EARN*t* (*t* = 0, 1, 2, 3) is the earnings in year *t* after the rating change; ΔDIV_1 is the change in dividends between years -2 and -1; ΔDIV0 is the change in dividends between years -1 and 0; DIV_1 are the dividends paid in year -1; ΔMV is the change in market value of the firm's equity between years -1 and 0; ΔLEV is the change in leverage between years -1 and 0; and GROWTH_1 is the change in sales revenue between years -2 and -1. Year 0 is the fiscal year of the rating change. The models are constructed to predict the probability of the event happening (upgrade and downgrade). Standard errors are reported in parentheses.

	Using data for all firms on Compustat with outstanding long-term debt during the sample period		Using a matched sample of firms with outstanding long-term debt matched on industry and firm size	
	Model 1 Rating upgrades	Model 2 Rating downgrades	Model 3 Rating upgrades	Model 4 Rating downgrades
Intercept	-4.8227***	-3.4320***	0.3017	-0.1073
	(0.2541)	(0.1284)	(0.4314)	(0.2418)
ΔEARN_3	0.0001	-0.0010*	-0.0151	-0.0024
	(0.0007)	(0.0006)	(0.0176)	(0.0031)
ΔEARN_2	-0.0002	0.0006	-0.0291	0.0022
	(0.0015)	(0.0020)	(0.0204)	(0.0027)
ΔEARN_1	-0.0005	0.0013	-0.0266	0.0037
	(0.0015)	(0.0014)	(0.0255)	(0.0028)
ΔEARN0	0.0007	0.0005	0.0534**	-0.0015
	(0.0024)	(0.0005)	(0.0274)	(0.0021)
ΔEARN1	-0.0013**	0.0005	-0.0023	0.0044
	(0.0006)	(0.0008)	(0.0021)	(0.0079)
ΔEARN2	0.0001	-0.0001	-0.0141	-0.0020
	(0.0005)	(0.0011)	(0.0125)	(0.0063)
EARN_4	0.0492	0.9109**	-4.3657**	1.8411
	(0.2911)	(0.4229)	(1.7399)	(1.1875)
EARN_3	0.0804	0.9889**	-3.1144	2.3738*
	(0.3974)	(0.4620)	(2.1579)	(1.2833)
EARN_2	0.2757	-0.0828	-0.3945	0.6037
	(0.5107)	(0.1623)	(1.9897)	(1.1004)
EARN_1	0.6798***	-0.0147	2.2951	-6.4611***
	(0.2471)	(0.0235)	(1.9509)	(1.4012)
EARN0	0.7429***	-0.0151	2.6534	-3.6564**
	(0.2130)	(0.0258)	(1.8719)	(1.0685)
EARN1	0.0457	0.0065	0.8241	-0.9593
	(0.0353)	(0.0278)	(1.4214)	(0.6914)
EARN2	0.0046**	0.0019	-0.6436	-0.3427
	(0.0024)	(0.0057)	(0.9411)	(0.6397)
EARN3	0.0037*	0.0008	-0.1930	-1.2202**
	(0.0021)	(0.0023)	(0.5128)	(0.5828)

Table 6 (continued)

	Model 1 Rating upgrades	Model 2 Rating downgrades	Model 3 Rating upgrades	Model 4 Rating downgrades
ΔDIV_1	-0.0170	-0.0608***	-0.1456	-0.2296
	(0.0472)	(0.0169)	(0.2741)	(0.2307)
ΔDIV0	-0.0033	0.0043	-0.4148	0.0468
	(0.0270)	(0.0105)	(0.2880)	(0.2147)
DIV_1	0.0559	0.1333***	-0.1090	0.5037***
	(0.0556)	(0.0272)	(0.1321)	(0.1217)
ΔMV	0.0003	-0.6385***	0.0920	-0.3035***
	(0.0024)	(0.0995)	(0.0779)	(0.1065)
ΔLEV	-0.0197	-0.0465*	-0.0059	-0.0363
	(0.0191)	(0.0265)	(0.0259)	(0.0394)
GROWTH_1	-0.0272	-0.0826	0.0570	-0.0328
	(0.0632)	(0.0825)	(0.1944)	(0.0485)
Year Dummies	Included	Included	Included	Included
Industry Dummies	Included	Included	Included	Included
N (1; 0)	306; 41811	471; 41811	306, 399	471, 493
Prob. > χ^2	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Psuedo-R^2	0.0336	0.0630	0.0857	0.1429

***,**,* Indicates significance at the 1%, 5%, and 10% level, respectively

The dependent variable takes on a value of 1 if the firm experiences a rating change (upgrade or downgrade) and is 0 otherwise. In models 1 and 2, we include all firms with outstanding long-term debt on the Compustat database between 1990 and 2001 (our sample period) that did not experience a rating change and code them as 0. In models 3 and 4, we use a matched sample for firms with a dependent variable equal to 0. For each firm with a rating change, we use a control firm from the same year matched on industry (2-digit SIC code) and firm size (closest firm based on market value of equity). The vector of independent variables include lagged and leading values of earnings and dividends; changes in earnings and dividends; and control variables related to firm performance, such as growth rate in sales, change in market value of equity, and change in leverage. Specifically, the independent variables are defined as follows: ΔEARN_*t* (*t* = 1, 2, 3) is the change in earnings between year *t-1* and *t* prior to the ratings change; ΔEARN*t* (*t* = 0, 1, 2) is the change in earnings between year *t-1* and *t* after the ratings change; EARN_*t* (*t* = 1, 2, 3, 4) is the earnings in year *t* prior to the ratings change; EARN*t* (*t* = 0, 1, 2, 3) is the earnings in year *t* after the ratings change; ΔDIV_1 is the change in dividends between years -2 and -1; ΔDIV0 is the change in dividends between years -1 and 0; DIV_1 are the dividends paid in year -1; ΔMV is the change in market value of the firm's equity between years -1 and 0; ΔLEV is the change in leverage between years -1 and 0; and GROWTH_1 is the change in sales revenue between years -2 and -1. Note that year 0 is the fiscal year of the ratings change.

In model 1 for the upgrades sample, the coefficients on EARN0 and EARN_1 are positive and significant at the less than 1% level, while the coefficients on EARN2 and EARN3 are positive and significant at the 5% and 10% levels, respectively. In addition, ΔEARN1 is negative and significant, indicating that rating upgrades are associated with a decline in earnings in the year after the rating change, which is inconsistent with signaling. However, the significant positive coefficients on EARN2 and EARN3 suggest that rating upgrades are related to future earnings levels. Thus, results from model 1 provide evidence in favor of both the cash flow permanence and cash flow signaling hypotheses, although evidence for the latter is mixed. In model 2 for the downgrades sample, none of the earnings variables are significant in the post- rating-change period and only EARN_4 and EARN_3 are significant in the pre-rating-change period. The significant negative coefficient on ΔDIV_1 indicates that a positive change in dividends in year -1 lowers the likelihood of a rating downgrade. A positive change in dividends is indicative of a positive change in cash flows and thus a lower risk for debt holders. The positive and significant value for DIV_1, indicating that firms with a higher level of dividends have a higher likelihood of a rating downgrade, appears counter intuitive from a cash flow perspective. One possible explanation could be that firms that maintain a high dividend payout have more cash flows committed to shareholders, thus increasing the likelihood of financial distress for debt holders in subsequent years. The negative value for ΔMV suggests that firms with increasing market values (higher cash flow or lower risk) have a lower likelihood of a rating downgrade. The negative value on ΔLEV is, however, confusing. On the one hand, an increase in the amount of long-term debt would typically suggest an increase in the financial distress costs for current debt holders. On the other hand, from

a signaling perspective, an increase in leverage indicates stable and higher cash flows in the future to service outstanding debt obligations. In this sense, the negative coefficient on ΔLEV provides support for the cash flow signaling hypothesis. We note, however, that the ΔLEV coefficient is marginally significant at the 10% level.

Models 3 and 4 use a matched sample. For the upgrades sample, ΔEARN0 is positive and significant and none of the other variables, with the exception of EARN_4, are significant. Thus, firms with a positive change in earnings in the most recent time period are more likely to have their rating upgraded. For the downgrades sample, EARN_1 and EARN0 are negative and significant, while EARN3 is negative and significant. The significant positive sign on EARN_3 is inconsistent with the signaling hypothesis. Again, we note that this coefficient is only marginally significant at the 10% level. The coefficients on ΔMV and DIV_1 are consistent with the results of model 2. In sum, the results from the matched sample analysis are similar to those reported for models 1 and 2.[31]

The overall results from the four models in table 6 are mixed and suggest that both the cash flow permanence and cash flow signaling hypotheses are supported. However, when we focus on the five years surrounding the ratings change (year -2 to year +2), arguably a more pertinent time period given the findings from the univariate analyses in tables 4 and 5, the evidence is substantially more in favor of the cash flow permanence hypothesis. The evidence collectively from tables 4, 5, and 6 seems to suggest that rating agencies respond to permanent changes in cash flows and that the rating changes contain little, and often conflicting, information about subsequent firm performance.

4.5 Announcement period abnormal returns and future earnings changes

The evidence presented thus far appears to provide support more in favor of the cash flow permanence hypothesis than the signaling hypothesis. We conduct further tests to determine if cash flow signaling has any role in interpreting the abnormal returns around the announcement of rating updates. Ordinary least squares (OLS) regression analyses are undertaken to test if subsequent earnings changes are related to the stock price response at the announcement of a bond rating change. Previous studies report that prior earnings changes may be used to forecast subsequent earnings. Therefore, the standardized change in earnings in year *t-1* is included as an independent variable in the regression model for year *t*.[32] The following regression model for each year following a ratings change is estimated:

$$\Delta E_{it} = \beta_0 + \beta_1 CAR_i + \beta_2 \Delta E_{it-1} + \varepsilon_{it}, \quad (3)$$

where ΔE_{it} is the standardized earnings change for firm *i* in year *t* as defined in equation (1), and CAR_i is the market-adjusted cumulative abnormal return over days (-1, +1) surrounding the ratings change.[33] The coefficient of interest is β_1. If rating changes convey information regarding future earnings, this coefficient will be positive and significant. If earnings changes in year *t-1* can be used to forecast changes in year *t* earnings, then β_2 will be non-zero. The results from these regressions are reported in table 7.[34] Note that only the full-sample results are presented and discussed, as the results for the subsamples were qualitatively similar.

For both rating upgrades (panel A) and downgrades (panel B), β_1 is positive and significant for year 0, confirming a positive relationship between the announcement period abnormal returns and earnings changes in year 0. Although the significantly negative β_1 coefficients in years +1 and +2 for the downgrade sample in panel B are not consistent with the cash flow signaling hypothesis, they are consistent with the earnings reversals observed in the years following a ratings downgrade (see table 3). Overall, the OLS regression analyses suggest that rating updates contain no information about future earnings performance, since subsequent earnings changes are not related to the abnormal returns around the announcement date.

[31] We also estimated logistic regressions by substituting the actual earnings levels and changes in earnings with a variable, NNEGEARN, which is the number of years earnings were negative in the four years preceding the rating adjustment. The coefficient on this variable was negative but insignificant for the upgrade sample and positive and significant at the less than 1% level for the downgrade sample. Thus, repeated negative earnings increase the likelihood of a rating downgrade. Consistent with Altman and Rijken (2004), this suggests that credit rating agencies wait for performance changes to display a definite trend before acting to adjust the rating. It provides further support for the cash flow permanence hypothesis.

[32] Although not reported in the table, we did not find any multicollinearity among the independent variables.

[33] In separate OLS regressions, the market model abnormal returns were used as the independent variable. The results were essentially the same as those reported here.

[34] OLS regressions were estimated for each year, but the results are reported only for years 0 to +2 for brevity, as the results for years 3 to 5 were not significant.

Table 7. Regression results of announcement period cumulative abnormal returns and subsequent annual earnings changes for the full sample of rating upgrades and downgrades

This table presents the regression results for the relation between changes in earnings following the announcement of a bond rating change, and the market-adjusted announcement returns for firms that had their bond ratings changed between 1990 and 2001.

$$\Delta E_{it} = \beta_0 + \beta_1 CAR_i + \beta_2 \Delta E_{it-1} + \varepsilon_{it}$$

ΔE_{it} is the standardized earnings change for firm *i* in year *t* is regressed against CAR_i, the market-adjusted abnormal returns from one day prior to the bond rating change until one day after the rating change, and ΔE_{it-1} is the prior year's earnings change. Year 0 is defined as the first fiscal year of the rating change announcement. Student *t*-statistics are reported in parentheses.

Year relative to bond rating change	N	β_0	β_1	β_2	R^2
Panel A: Rating upgrades					
0	440	0.0330 (2.45)**	0.6186 (2.11)**	0.1213 (2.36)**	0.022
+1	408	-0.0006 (-0.07)	-0.0319 (-0.17)	-0.0141 (-0.47)	0.001
+2	375	-0.0101 (-1.05)	0.0480 (0.24)	0.2349 (3.08)***	0.025
Panel B: Rating downgrades					
0	720	-0.3692 (-5.62)***	1.2209 (2.37)**	-0.6307 (-21.14)***	0.384
+1	658	0.1966 (3.83)***	-1.6722 (-4.00)***	-0.2521 (-10.72)***	0.165
+2	601	0.1449 (3.93)***	-0.6718 (-2.11)**	-0.5144 (-17.66)***	0.343

***, **, * Indicates significance at the 1%, 5%, and 10% level, respectively

In both panels, surprisingly, the β_2 coefficients are significantly negative for all but one regression, a result inconsistent with the earnings drift argument. Additional tests, not reported here, show that positive earnings drifts occur prior to rating changes, but not following the rating changes. Similar unexplained negative earnings drift coefficients were reported by Healy and Palepu (1988) following dividend initiations and omissions. One possible explanation, again consistent with the cash flow permanence argument, is that the rating change happens when the worst (in the case of downgrades) is over, in which case earnings are poised for a reversal.

4.6 Relationship between bond rating change information and future dividend changes

There is some evidence to suggest, at least for downgrades, that credit rating updates contain information on future dividend adjustments. We examine this relationship next. Once again, OLS regression analyses are used to test if dividend changes are related to the market reaction at the announcement of a bond rating change. The regression model is estimated for each of the years following the rating change as follows:

$$\Delta D_{it} = \beta_0 + \beta_1 CAR_i + \varepsilon_{it}, \quad (4)$$

ΔD_{it} is the standardized dividend change for firm *i* in year *t* as defined in equation (2), and CAR_i is the market-adjusted cumulative abnormal return over the days (-1, +1) surrounding the announcement.[35] We exclude the drift control variable since dividends in general are much more stable, i.e., an increase in dividends in one period is not likely to be followed by another dividend increase in close succession. Again, only full-sample results are reported. Where significant, the results for the subsamples were qualitatively similar.

Once again, the coefficient of interest is β_1. If rating changes convey information about future dividends, this coefficient will be positive and significant. The regression results for annual dividend changes are reported in Table 8.[36]

[35] Once again, the regressions were estimated using market model abnormal returns as the independent variable. The results were essentially the same as those reported here.

[36] We also estimated the models using quarterly dividend changes as the dependent variable using quarterly dividends for four quarters after the rating change, including the quarter in which the rating change was announced. The results were consistent with those reported for the annual dividend changes and are hence not reported.

Table 8. Regression results of announcement period cumulative abnormal returns and subsequent annual dividends changes for the full sample of rating upgrades and downgrades

This table presents the regression results for the relation between changes in annual dividends following the announcement of a bond rating change, and the market-adjusted announcement returns for firms that had their bond ratings changed between 1990 and 2001.

$$\Delta D_{it} = \beta_0 + \beta_1 CAR_i + \varepsilon_{it}$$

ΔD_{it} is the standardized annual dividend change for firm i in year t is regressed against CAR_i, the market-adjusted abnormal returns from one day prior to the rating change until one day after the rating change. Year 0 is defined as the first fiscal year of the rating change announcement. Student t-statistics are reported in parentheses.

Year relative to bond rating change	N	β_0	β_1	R^2
		Panel A: Rating upgrades		
0	247	-0.0008 (-1.15)	-0.0078 (-0.39)	0.001
+1	241	0.0005 (1.19)	-0.0018 (-0.15)	0.000
+2	211	0.0002 (0.42)	0.0136 (1.13)	0.006
		Panel B: Rating downgrades		
0	308	-0.0081*** (-4.95)	0.1275*** (4.57)	0.064
+1	285	-0.0018*** (-3.70)	0.0022 (0.27)	0.000
+2	259	-0.0003 (-0.67)	-0.0209** (-2.45)	0.023

***, **, * Indicates significance at the 1%, 5% and 10% level, respectively

The results in table 8 confirm that there is no relationship between announcement period stock returns and subsequent dividend changes for upgrades (panel A). However, there is a significant positive relationship for rating downgrades (panel B). β_1 is positive and significant for the year 0 regression, and although not significant, is still positive in the year +1 regression. The negative β_1 coefficient in year +2 reflects the increasing dividends, which is consistent with the earnings reversal observed after the downgrade. This suggests that firms are quick to reestablish with their prior dividend policy as soon as they are in a position to do so. This result is consistent with Healy and Palepu (1988) and Benartzi et al. (1997).[37]

[37] In an efficient market, if investors revise their expectations of future dividends at the time of the rating change, then subsequent changes in dividend policy should not result in a price response. We tested the abnormal returns to subsequent dividend policy adjustments for both upgrades and downgrades. There is no evidence that firms adjust their dividend policy after upgrades. For downgrades, our analyses show that investors do not fully revise their forecast of future dividends at the time of the bond rating downgrade. Subsequent dividend decreases, thus, only partially explain the negative abnormal returns observed at the announcement of a bond rating downgrade.

Our evidence provides limited support, if any, for the cash flow signaling hypothesis, and that too only for the rating downgrade sample. Overwhelmingly, the evidence seems to suggest that rating revisions follow a period of rising or falling earnings and are not indicative of such a trend persisting in the future.

5 Summary and conclusions

The previous empirical evidence on bond rating updates is mixed. While earlier studies suggest that credit rating agencies do not necessarily provide any new information to investors when the agencies update their bond ratings, recent evidence suggests that rating downgrades may contain information about subsequent earnings performance. In this paper, we examine the information contained in bond rating changes by analyzing earnings and dividend changes around rating changes and test if the empirical evidence is consistent with the cash flow signaling or the cash flow permanence hypotheses.

We note that, for upgrades and downgrades, the vast majority of rating updates are to the next immediate category. In only 15% of the upgrades and 30% of the downgrades was the change over multiple rating categories. In addition, for upgrades and downgrades, in only 10% of the downgrades did the ratings switch between investment and non-investment grade categories.

Consistent with prior work, we find significant negative abnormal returns for rating downgrades and no announcement period abnormal returns for rating upgrades. These results suggest that rating downgrades either provide information to financial markets or impose costs on the affected firms (Holthausen and Leftwich, 1986), and that rating upgrades are nonevents. We also find a run-up (run-down) in stock prices over days -60 to -2 days prior to bond rating upgrades (downgrades), indicating that investors partially anticipate the rating change.

Rating upgrades are preceded by earnings increases in the year prior to and the year of the rating change, but earnings performance does not show any change subsequent to the rating change. Likewise, rating downgrades are preceded by a decline in earnings in the two years prior to the announcement. However, contrary to expectations, we observe that earnings increase in the year following the rating downgrade. For upgrades, the results are largely driven by firms whose rating changed only to the next category. However, for downgrades, the results are consistent for all subsamples—firms whose ratings were downgraded by multiple categories, firms whose ratings were downgraded to the next category, as well as firms whose ratings were downgraded from investment to non-investment grade.

The results from logistic regressions provide evidence consistent with both the cash flow permanence and cash flow signaling hypotheses. The evidence, however, is substantially more in favor of cash flow permanence. Support for both arguments is possible, since credit rating agencies most likely act after firm performance has changed and reached a threshold but performance may continue to change in the year of the rating adjustment or even beyond the year of the revision. Ordinary least squares regressions show that, while there is a positive relationship between the announcement period abnormal returns at the time of rating changes and earnings change in the year of the announcement, there is no relationship with earnings in subsequent years. Finally, we observe that firms respond to rating downgrades by adjusting their dividends policy (dividends decrease), but no adjustment to dividend policy is observed after upgrades.

Overall, our evidence is more indicative of credit rating agencies responding to ”permanent” cash flow changes rather than providing information about future earnings.

References

1. Aharony, J., Swary, I., 1980. Quarterly dividends and earnings announcements and stockholders' Returns: An empirical analysis. Journal of Finance 35(1), 1-12.
2. Aivazian, V.A., Booth, L., Cleary, S., 2006. Dividend smoothing and debt ratings. Journal of Financial and Quantitative Analysis 41(2), 439-453.
3. Altman, E.I., Koa, D.L., 1992. The implications of corporate bond rating drift. Financial Analysts Journal 48(3), 64-75.
4. Altman, E.I., Rijken, H.A., 2004. How rating agencies achieve rating stability. Journal of Banking and Finance 28(11), 2679-2714.
5. Asquith, P., Mullins, Jr., D.W., 1983. The impact of initiating dividend payments on shareholders' wealth. Journal of Business 56(1), 77-96.
6. Bajaj, M., Vijh, A., 1990. Dividend clienteles and the information content of dividend changes. Journal of Financial Economics 26(1), 193-219.
7. Ball, R.J., Brown, P., 1968. An empirical analysis of accounting income numbers. Journal of Accounting Research 6(2), 159-178.
8. Barron, M.J., Clare, A.D., Thomas, S.H., 1997. The effect of bond changes and new ratings on U.K. stock returns. Journal of Business Finance and Accounting 24(3), 497-509.
9. Benartzi, S., Michaely, R., Thaler, R., 1997. Do changes in dividends signal the future or the past? Journal of Finance 52(3), 1007-1033.
10. Bhattacharya, S., 1979. Imperfect information, dividend policy and the "bird in the hand" fallacy. The Bell Journal of Economics 10, 259-270.
11. Boehmer, E., Ljungqvist, A., 2004. On the decision to go public: Evidence from privately-held firms. NYU Working Paper No. FIN-04-002.
12. Brickley, J., 1983. Shareholders wealth, information signaling, and the specially designated dividend: An empirical study. Journal of Financial Economics 12(2), 187-209.
13. Bulan L.T., Subramanian, N., Tanlu, L.D., 2007. On the timing of dividend initiations. Financial Management 36, 31-65.
14. Cox, D.R., 1972. Regression models and life-tables. Journal of the Royal Statistical Society 34(2), 187-220.
15. Dann, L., 1981. Common stock repurchases: An analysis of returns to bondholders and stockholders. Journal of Financial Economics 9, 113-138.
16. Dann, L.Y., Masulis, R.W., Mayers, D., 1991. Repurchase tender offers and earnings information. Journal of Accounting and Economics 14, 217-251.
17. Davidson, W.N., Glascock, J.L., Henderson, G.V., 1987. Announcement effects of Moody's bond rating changes on equity returns. Quarterly Journal of Business and Economics 26(3), 67-78.
18. DeAngelo H., DeAngelo L., Skinner, D.J., 1996. Reversal of fortune, dividend signaling and the disappearance of sustained earnings growth. Journal of Financial Economics 40, 341-371.
19. Denis, D., Denis, D., Sarin, A., 1994. The information content of dividend changes: Cash flow signaling,overinvestment and dividend clienteles. Journal of Financial and Quantitative Analysis 29, 567-587.
20. Dichev, I.D., Piotroski, J.D., 2001. The long-run stock returns following bond rating changes. Journal of Finance 56(1), 173-203.
21. Easterbrook, F., 1985. Two-agency cost explanation of dividends. American Economic Review 74(4), 650-659.
22. Ederington, L., Yawitz, J.B., Roberts, B.E., 1987. The information content of bond ratings. Journal of Financial Research 10(2), 211-226.

23. Goh, J.C., Ederington, L.H., 1993. Is a bond rating downgrade bad news, good news, or no news for stockholders? Journal of Finance 48(5), 2001-2008.
24. Griffin, P.A., Sanvicente, A.A., 1982. Common stock returns and ratings changes: A methodological comparison. Journal of Finance 37(1), 103-120.
25. Guay, W., Harford, J., 2000. The cash-flow permanence and information content of dividend increases versus repurchases. Journal of Financial Economics 57, 385-415.
26. Hand, J.R.M., Holthausen, R.W., Leftwich, R.W. 1992. The effect of bond rating agency announcements on bond and stock prices. Journal of Finance 47(2), 733-752.
27. Healy, P.M., Palepu, K., 1988. Earnings information conveyed by dividend initiations and omissions. Journal of Financial Economics 21(2), 149-175.
28. Holthausen, R.W., Leftwich, R.W., 1986. The effect of bond rating changes on common stock prices. Journal of Financial Economics 17(1), 57-89.
29. Hsueh, P.L., Liu, A.Y., 1992. Market anticipation and the effect of bond rating changes on common stock prices. Journal of Business Research 24(3), 225-239.
30. Hull, J., Predescu, M., White, A., 2004. The relationship between credit default swap spreads, bond yields, and credit rating announcements. Journal of Banking and Finance 28(11), 2789-2811.
31. Jagannathan M., Stephens, C.P., Weisbach M.S., 2000. Financial flexibility and the choice between dividends and stock repurchases. Journal of Financial Economics 57, 355-384.
32. Jensen, M.C., Meckling, W., 1976. Theory of the firm: managerial behavior, agency costs, and capital structure. Journal of Financial Economics 3(4), 305-360.
33. John, K., Williams, J., 1985. Dividends, dilution and taxes: A signaling equilibrium. Journal of Finance 40(4), 1053-1070.
34. Kaplan, R.S., Urwitz, G., 1979. Statistical models of bond ratings: A methodological inquiry. Journal of Business 52(2), 231-261.
35. Lang, L.H.P., Litzenberger, R.H., 1989. Dividend announcements: Cash flow signaling vs. free cash flow hypothesis. Journal of Financial Economics 24(1), 181-191.
36. Lie, E., McConnell. J.J., 1998. Earnings signals in fixed-price and Dutch-auction self-tender offers. Journal of Financial Economics 49, 161-186.
37. Linter, J., 1956. Distribution of incomes of corporations among dividends, retained earnings and taxes. American Economic Review 46(2), 97-113.
38. MacKinlay, C., 1997. Event studies in economics and finance. Journal of Economic Literature 35(1), 13-39.
39. Miller, M., 1987. The information content of dividends, in: Bossons, J., Dornbush, R., Fischer, S. (Eds.), Macroeconomics: Essays in Honor of Franco Modigliani. MIT Press, Cambridge, Massachusetts, pp. 37-61.
40. Miller, M., Rock, K., 1985. Dividend policy under asymmetric information. Journal of Finance 40(4), 1031-1051.
41. Nissim, D., Ziv, A., 2001. Dividend changes and future profitability. Journal of Finance 56(6), 2111-2133.
42. Ofer A.H., Siegel, D.R., 1987. Corporate financial policy, information, and market expectations: an empirical investigation of dividends. Journal of Finance 42 (4), 889-913.
43. Patell, J.M., 1976. Corporate forecasts of earnings per share and stock price behavior: Empirical test. Journal of Accounting Research 14(2), 246-276.
44. Pinches, G.E., Singleton, J.C., 1978. The adjustment of stock prices to bond rating changes. Journal of Finance 33(1), 29-44.
45. Standard and Poor's. 2005. Fact Sheet—Understanding Credit Ratings. Standard and Poor's.
46. Wakeman, L., 1984. The Real Function of Bond Rating Agencies, in: Jensen, M.C., Smith, Jr., C.W. (Eds.), The Modern Theory of Corporate Finance. McGraw-Hill, New York, pp.