Credit Ratings and The Cross-Section of Stock Returns

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Abstract

Low-credit-risk firms realize higher returns than high-credit-risk firms. This effect is puzzling because investors seem to pay a premium for bearing credit risk. This paper shows that the credit risk effect exists only in periods around credit rating downgrades and is due to the significant negative response of the lowest-rated stocks to downgrades. Around downgrades, low-rated firms experience considerable negative returns, precipitated by substantial deterioration in their operating and financial performance, large negative analyst forecast revisions and earnings surprises, and strong institutional selling. In contrast, returns do not differ across credit risk groups in stable or improving credit conditions. Remarkably, the group of low-rated stocks driving the credit risk effect accounts for less than 4% of the total market capitalization, suggesting that there is no pervasive distress factor in the cross-section of returns.

Introduction

It is a fundamental principle of financial economics that higher-risk assets should command higher expected returns. This risk-return tradeoff underlies the conceptual framework of asset pricing and investment decisions in efficient markets. Empirically, however, Campbell, Hilscher, and Szilagyi (2005), Dichev (1998) and Garlappi, Shu, and Yan (2006), among others, demonstrate a *negative* cross-sectional correlation between credit risk and future stock returns. This negative relation seems to be an anomalous pattern in the cross-section of stock returns because it suggests that investors pay a premium for bearing credit risk.

This paper seeks to resolve this puzzling credit risk effect. In particular, we identify the mechanism that gives rise to the negative relation between credit risk and returns and ultimately show that the credit risk effect does not pose a challenge to rational pricing.

We start by showing that our sample of 3,578 NYSE, AMEX, and NASDAQ firms rated by Standard & Poor's confirms the significance of the credit risk effect over the July 1985-December 2003 period.[1] Specifically, the return differential between the highest- and lowest-rated decile portfolio is 1.16% (7.60%) over a one-month (year) period after the portfolio formation date. The negative relation between credit risk and returns is also confirmed in Fama and MacBeth (1973) cross-sectional regressions of monthly individual stock returns on credit rating. We use the CAPM of Sharpe (1964) and Lintner (1965) and the Fama and French (1993) three-factor model, as well as the characteristic based model of Daniel, Grinblatt, Titman, and Wermers (1997) to demonstrate that the credit risk effect is robust to adjustments for risk factors as well as firm characteristics.

We demonstrate that the negative relation between credit risk and average returns depends *crucially* on credit cycles. The significant relationship prevails only during credit rating downgrade periods and is attributable to low-rated firms that experience considerable price drops six months before and after credit rating downgrades. In contrast, the credit risk effect is statistically and economically insignificant during periods of stable or improving credit conditions, which capture about 90% of the overall sample observations. From an economic perspective, trading strategies that sell low-credit-risk

[1] We use the S&P Long-Term Domestic Issuer Credit Rating. Data on this variable is available on the Compustat tapes at a quarterly frequency starting from the second quarter of 1985.

and buy high-credit-risk stocks during non-downgrade periods provide small and insignificant payoffs. Moreover, the credit rating is statistically and economically insignificant in monthly cross-sectional regressions during non-downgrade periods.

Abnormal stock price declines following rating downgrades have been documented by Dichev and Piotroski (2001). In this paper, we uncover substantial *cross-sectional* differences in stock price responses to credit rating downgrades. The stock price drop around rating downgrades is considerable among low-quality stocks, whereas high-quality firms realize positive returns around downgrades. It is the differential response of high- and low-credit-risk stocks to rating downgrades that gives rise to the negative relation between credit risk and stock returns.

So why do high- and low-credit-risk firms respond differently to downgrades? We document that, before and after the downgrade, low-rated firms experience drastic deterioration in their operating and financial performance, as measured by industry-adjusted accounting ratios including sales growth, profit margin, net cash flow, interest coverage, and asset turnover. This deteriorating performance of high-credit-risk stocks both before and after rating downgrades is not anticipated by the market as evidenced by the analyst forecast revisions and earnings surprises. Analyst forecast revisions and earnings surprises around downgrades are negative and much larger in absolute values for low-rated stocks for up-to a year after the downgrade. We also find that institutions reduce by about 50% their holdings of the lowest-rated stocks around rating downgrades, while their holdings of the highest-quality stocks do not change. This selling pressure is consistent with the stock price decline of low-rated stocks around downgrades.

The negative relation between credit risk and returns is driven by the poor price performance of low-rated stocks around downgrades. Furthermore, we show that rating downgrades are larger in magnitude and frequency among low-rated than among high-rated firms. We also document that the probability of low-rated stocks getting delisted is quite high. This evidence thus reveals yet another puzzle: *why don't prices of low-rated stocks reflect the possibility of large losses around downgrades?* In other words, why is there an apparently large and persistent mispricing amongst the low-rated stocks as they consistently underperform otherwise similar stocks?

The answer is twofold. First, due to high uncertainty among the lowest-rated stocks, investors may not be aware of the extent of mispricing and may not adjust their expectations to fully account for the likelihood of large losses from these stocks during

downgrades. Second, it may be difficult for investors to correct the mispricing because of the difficulties in short selling shares of stocks that are highly illiquid. Indeed, we show that low-rated stocks are small, highly illiquid, and followed by very few analysts who constantly revise their earnings forecasts downwards.

The credit risk anomaly, however, is not pervasive. It is prominent in a relatively small fraction of the sample observations as well as in a surprisingly small fraction of the overall market capitalization of our sample of rated firms. We document that the apparent mispricing is confined to stocks rated BB− and below, accounting for only 3.4% of the sample of rated stocks by market capitalization.

Fama and French (1993) have suggested that their High-Minus-Low (HML) factor based on the book-to-market ratio is a proxy for distress risk. However, we show that, except for rating downgrade periods and except for a small fraction of firms, there is no differential return across high- and low-rated firms. Thus, it is unlikely that there is a pervasive distress factor that impacts the cross-section of stock returns.

The rest of the paper is organized as follows. The next section discusses the data. Section 2 presents the results and section 3 concludes.

1 Data

We extract monthly returns on all NYSE, AMEX, and NASDAQ stocks listed in the CRSP database subject to the requirement that the beginning-of-month stock price is at least $1. While this is done to ensure that the empirical findings are not driven by low-priced and extremely illiquid stocks, we find that our results are robust to the inclusion of stocks with price below $1. Throughout the paper, we use delisting returns whenever a stock is delisted. This is important because a number of stocks delist due to financial distress.

The filtering procedure delivers a universe of 13,018 stocks. From this universe, we choose stocks that are rated by Standard & Poor's. This leaves us with 3,578 rated stocks over the July 1985 through December 2003 period, corresponding to 434,746 month-return observations. The sample starts when firm ratings, i.e. "long-term issuer credit rating" (item=SPDRC) by Standard & Poor's, become available on the quarterly COMPUSTAT tapes. The universe of 3,578 rated firms forms the basis for our empirical

analysis of the credit-rating-return relation.

The S&P issuer rating used here is an essential component of our analysis. The Standard & Poor's assigns this rating to a firm, not a bond. As defined by S&P, prior to 1998, this issuer rating is based on the firm's senior publicly traded debt. After 1998, the rating is based on the overall quality of the firm's outstanding debt, either public or private.

For the empirical analysis that follows, we transform the S&P ratings into conventional numerical scores. In particular, AAA takes on the value 1 and D takes on the value 22.[2] Thus, a higher numerical score corresponds to a lower credit rating or higher credit risk. Numerical ratings at or below 10 (BBB− or better) are considered investment grade, and ratings of 11 or higher (BB+ or worse) are labeled high-yield or non-investment grade. The equally-weighted average rating of the 3,578 firms in our sample is 8.83 (approximately BBB) and the median is 9 (BBB).

2 Results

To confirm the credit-risk-return puzzle for our sample of rated firms, we present in Panel A of Table 1 returns for ten portfolios sorted monthly by issuer credit rating. Portfolio returns are computed first by equally weighting individual stock returns realized in the month subsequent to portfolio formation and then averaging through the mean cross-sectional monthly returns. The average monthly return for the highest (lowest) credit rating portfolio C_1 (C_{10}) is 1.34% (0.17%) per month. The difference in mean returns between the highest and lowest rating portfolio, $C_1 - C_{10}$, is a statistically and economically significant 1.16% per month.

Further, the negative credit-rating-return relation persists over several months. Specifically, the $C_1 - C_{10}$ cumulative return over the 6 (12) [24] months subsequent to portfolio formation is 4.02% (7.60%) [13.14%].[3] The $C_1 - C_{10}$ returns are higher, on average, in non-January months (1.71% per month) and negative in January (−5.01% per month).

[2]The entire spectrum of ratings is as follows. AAA=1, AA+=2, AA=3, AA−=4, A+=5, A=6, A−=7, BBB+=8, BBB=9, BBB−=10, BB+=11, BB=12, BB−=13, B+=14, B=15, B−=16, CCC+=17, CCC=18, CCC−=19, CC=20, C=21, D=22.

[3]Cumulative returns are computed using overlapping monthly returns. Hence, throughout the paper, we compute t-statistics for cumulative returns using Newey-West standard errors.

The average $C_1 - C_{10}$ return is 1.08% per month during expansions and 2.24% (albeit statistically insignificant) during recessions.[4]

The documented relation between credit ratings and returns represents an anomalous pattern in the cross-section of returns because investors are expected to demand higher risk premiums and thus higher expected returns for purchasing stocks with higher credit risk. It is possible that credit ratings measure unsystematic risk that can be diversified away. If so, high- and low-rated stocks should realize statistically and economically indistinguishable average returns. However, the empirical evidence is to the contrary: low-credit-risk firms earn on average a significant 1.16% per month more than high-credit-risk firms.

It should be noted that a large fraction of the $C_1 - C_{10}$ payoff is generated by the lowest-rated stock portfolio C_{10}. In particular, while the overall $C_1 - C_{10}$ return is 1.16% per month, the payoff to the portfolio $C_1 - C_9$ is less than half that amount at 0.47% per month. Moreover, the cumulative 6 (12) [24] month return for the $C_1 - C_9$ portfolio is 2.41% (5.23%) [10.18%] compared to 4.02% (7.60%) [13.14%] for the $C_1 - C_{10}$ portfolio. Similarly, the return in the non-January months for $C_1 - C_9$ is only 0.77% per month as compared to 1.71% for the $C_1 - C_{10}$ portfolio. Of course, the payoff for the $C_1 - C_9$ portfolio, even though smaller, is still anomalous.

Next, we explore whether the return differential between the high- and low-rated stocks can be explained by the size, value, and momentum characteristics following the approach in Daniel, Grinblatt, Titman, and Wermers (1997). In particular, we form $5 \times 5 \times 5$ size, book-to-market, and past-twelve-month return sorted portfolios. We then subtract the monthly return of the portfolio to which a stock belongs from the individual monthly stock return to obtain the stock's characteristic-adjusted return. The mean characteristic-adjusted returns are summarized in Panel B of Table 1.

We find that adjusting for size, value, and momentum leaves the credit-rating-return relation unchanged. In particular, the $C_1 - C_{10}$ portfolio realizes a characteristic-adjusted monthly payoff that is significant at 0.94%, only slightly lower than the 1.16% raw return. The characteristic-adjusted payoff earned by the $C_1 - C_9$ portfolio is 0.51% per month, even higher than the 0.47% unadjusted payoff. The monthly $C_1 - C_{10}$ characteristic-adjusted return is significant at 0.87% during expansions and 1.18% in

[4]Business cycle expansions and recessions are defined by NBER (see www.nber.org/cycles.html).

non-January months. Moreover, the cumulative characteristic-adjusted return generated by the $C_1 - C_{10}$ portfolio over 6 (12) [24] months subsequent to the portfolio formation date is 3.68% (6.02%) [9.16%]. Overall, the credit risk effect in the cross-section of returns is an independent anomaly unrelated to the well documented size, book-to-market, and past return effects.

To get some perspective about the firms populating the different credit rating deciles, we report in Table 2 average values of various firm-level characteristics. The reported characteristics are computed as the time-series mean of the median cross-sectional characteristic.

Perhaps not surprisingly, the average firm size (as measured by market capitalization) decreases monotonically with worsening credit rating. The highest-rated stocks have an average market capitalization of $4.91 billion, while the lowest-rated stocks have an average capitalization of $0.15 billion. The book-to-market ratio increases with credit risk possibly because the high-credit-risk stocks have low market values. The average stock price also decreases monotonically with increasing credit risk from $45.99 for the highest-rated stocks to $7.38 for the lowest-rated stocks. Notice also that institutions hold far fewer shares of low-rated stocks. Institutional holding amounts to over 50% of shares outstanding for the high-rated stocks and only 25% for the low-rated stocks.

High-rated firms are much more liquid than low-rated firms. The average monthly dollar trading volume decreases from $384 million ($108 million) for the highest-rated NYSE/AMEX (Nasdaq) stocks to $6 million ($17 million) for the lowest-rated stocks. Moreover, Amihud (2002)'s illiquidity measure is 0.05 (0.58) for NYSE/AMEX (Nasdaq) highest-quality stocks and 1.01 (0.96) for the lowest-quality stocks.[5] This measure is computed as the absolute price change per dollar of daily trading volume

$$ILLIQ_{it} = \frac{1}{D_{it}} \sum_{t=1}^{D_{it}} \frac{|R_{itd}|}{DVOL_{itd}} * 10^6, \tag{1}$$

where R_{itd} is the daily return and $DVOL_{itd}$ is the dollar trading volume of stock i on day d in month t, and D_{it} is the number of days in month t for which data is available for stock i (a minimum of ten trading days is required).

[5]Hasbrouck (2005) compares effective and price-impact measures estimated from daily data to those from high-frequency data and finds that Amihud (2002)'s measure is the most highly correlated with trade-based measures.

We next analyze several variables that proxy for uncertainty about the firm's profitability. In particular, the number of analysts following a firm decreases monotonically with credit risk from about 19 for the highest to 4 for the lowest-rated stocks. In addition, analyst revisions are negative and much larger in absolute value for the low- versus high-rated stocks. Earnings surprises (measured by standardized unexpected earnings (SUE)) are positive for high-quality firms and negative for low-quality firms.[6]

Finally, we analyze leverage and the market model's alpha and beta. Leverage, computed as the book value of long-term debt to market capitalization, increases monotonically from 0.41 for the highest-rated stocks to 1.28 for the lowest-rated stocks. The CAPM beta (alpha) increases (decreases) with credit risk. Notice that low-rated stocks have higher beta and, at the same time, they realize lower risk-adjusted returns. If the market beta is a good measure of systematic risk, low-rated stocks should earn higher returns. The realized lower return is thus puzzling.

Overall, we have found that the low-rated stocks are smaller and lower priced, and have higher market betas, lower dollar trading volumes, higher leverage, lower institutional holding, and higher uncertainty about future profitability, as compared to the high-rated stocks.

Thus far, we have studied the credit risk effect based on portfolios. A natural next step is to examine the credit risk effect in cross-sectional regressions. In particular, we run Fama and MacBeth (1973) regressions of individual stock returns on credit rating, controlling for additional firm characteristics:

$$R_{jt} = a_t + b_t\, RATING_{jt-1} + \sum_{m=1}^{M} c_{mt}\, C_{mjt-2} + e_{jt}, \tag{2}$$

where $RATING$ represents the numerical score associated with the firm's rating (a higher numerical rating score corresponds to higher credit risk), C_{mjt} is the value of characteristic m for security j at time t, and M is the total number of characteristics.

The firm characteristics included are (i) Log(Size): firm size measured as the market value of equity, (ii) Log(BM): ratio of book value of equity to market value of equity calculated following the procedure in Fama and French (1992), (iii) Log(Turnover): measured as the ratio of monthly share trading volume to the number of shares outstanding,

[6]SUE is computed as the difference between actual earnings and earnings four quarters ago, standardized by the standard deviation of these earnings changes over the past eight quarters.

(iv) $r_{(t-7:t-2)}$: cumulative return over the last six months, and (v) SUE: standardized unexpected earnings. Following Brennan, Chordia, and Subrahmanyam (1998), these characteristics are lagged by two months relative to the month in which the dependent variable is measured. Also, turnover is measured separately for NYSE/AMEX and Nasdaq stocks.

Panel A of Table 3 reports the time-series averages of the slope coefficients $\hat{b}_t$ and $\hat{c}_{mt}$. The standard errors of these estimates are obtained using standard procedures applied to the time-series of the monthly estimates. The evidence shows that the coefficient of the lagged credit rating variable is -0.07 (t-stat$=-2.01$), which means that a one point higher numerical credit score (one point worse credit rating) is followed by 7 basis points lower future monthly returns. The second regression in Panel A excludes the credit rating and retains the lagged characteristics as independent variables. Of all characteristics, only the past six month return and SUE have a significant impact on the cross-section of future returns. The third regression nests credit rating and firm characteristics. The negative credit-risk-return relation is still significant and of the same magnitude whether or not firm characteristics are included as control variables. In sum, the statistical evidence based on cross-sectional regressions supports the negative credit-risk-return relation.

Indeed, whereas the credit rating summarizes the risk that creditors may not get repaid, the credit rating effect in the cross-section of returns could be related to a firm's systematic risk. Barring the agency problems between bondholders and shareholders, the risk faced by both should relate to the underlying cash flow risk of the firm. This is what we examine next. In particular, we make sure that risk-based asset pricing models do not capture the negative credit-risk-return relation. We risk-adjust raw returns in time-series regressions using the Capital Asset Pricing Model (CAPM) of Sharpe (1964) and Lintner (1965) as well as the Fama and French (1993) three factor model. Recall, we have already shown that the CAPM produces larger alphas and smaller betas for high-quality firms.

Our risk adjustment is based on cross-sectional asset-pricing tests applied to individual stocks. Similar to Brennan, Chordia, and Subrahmanyam (1998), we first run time-series regressions of individual stock returns on the risk factors prescribed by the CAPM and Fama-French model. We then run cross-sectional regressions of risk-adjusted returns on credit rating, as well the size, book-to-market, turnover, and past returns char-

acteristics. Under the null hypothesis of exact pricing, credit rating as well as equity characteristics should be statistically insignificant in the cross-sectional regressions

$$R_{jt} - R_{ft} - \sum_{k=1}^{K} \hat{\beta}_{jk} F_{kt} = a_t + b_t \, RATING_{jt-1} + \sum_{m=1}^{M} c_{mt} \, C_{mjt-2} + e_{jt}, \qquad (3)$$

where $\hat{\beta}_{jk}$ is estimated by a first-pass time-series regression of the stock's excess return on the asset pricing factors over the entire sample period with non-missing returns data.[7]

Panel B of Table 3 risk adjusts raw returns using the CAPM. The first regression specification, which does not include any of the characteristic except for credit rating, shows that the coefficient of RATING is a statistically significant -0.09, suggesting that a one point higher numerical credit score is followed by 9 basis points lower risk-adjusted returns. The credit rating effect is robust to controlling for size, book-to-market, SUE, past returns, and turnover. In Panel C of Table 3, the individual stock returns are risk-adjusted using the Fama and French (1993) factors.[8] The RATING coefficient is -0.08 as the equity characteristics are absent from the monthly cross-sectional regressions and -0.09 when controlling for firm characteristics.

Note that in Table 1 the difference in rating between the highest rating decile portfolio, AA, and the lowest rating decile portfolio, B$-$, is 14 rating points. This difference should result in a return differential of 1.12% (14×0.08), which is comparable to the 1.16% reported in Panel A of Table 1.

In sum, results based on (i) raw portfolio returns, (ii) characteristic-adjusted portfolio returns, (iii) individual stock returns, and (iv) individual stock returns risk-adjusted by asset pricing models, do conclusively suggest that higher-rated stocks realize higher raw, risk-adjusted, as well as characteristics-adjusted returns than lower-rated stocks.

2.1 The impact of downgrades

Our analysis thus far has focused on the credit rating level. Credit rating downgrade events may offer deeper insights into the economics of the credit-risk-return relation.

[7] While this entails the use of future data in calculating the factor loadings, Fama and French (1992) show that this forward looking does not impact the results. See also Avramov and Chordia (2006).

[8] We have also checked (results available upon request), that our findings are unchanged when adjusting with the Fama-French (1993) factors augmented with the momentum factor of Carhart (1997).

Studying downgrades is motivated by previous work, which demonstrates an asymmetric response of future bond (Hand, Holthausen, and Leftwich (1992)) and stock (Dichev and Piotroski (2001)) returns to credit rating changes. In particular, both papers document considerable abnormal bond and stock price declines following rating downgrades but no particular price advances following upgrades. We extend their analysis by looking at the differential response of high- and low-credit-risk stocks to rating downgrades.

As noted earlier, credit rating is available from COMPUSTAT on a quarterly basis. Thus, we can identify the quarter in which a downgrade occurs, but not the exact month of a downgrade event. In the following analysis, we assume that the downgrade occurs in the second month of quarter. Qualitatively, the results do not change when the downgrade is assumed to occur in either the first or third month of the quarter.

Table 4 provides a comprehensive summary of credit rating downgrades both by credit risk (Panel A) and by frequency of downgrades (Panel B). The first two rows in Panel A present the number and size of credit rating downgrades as well as returns around downgrades for the credit risk sorted decile portfolios. Note that the number of downgrades in the highest-rated decile is 326 while the number in the lowest-rated decile is much larger at 910. The downgrade magnitude is also much larger for non-investment-grade firms. Specifically, the average size of a downgrade amongst the lowest-rated stocks is 2.91 points (moving from B− to CCC−), whereas the average downgrade amongst the highest-rated stocks is 1.44 points (moving from AA to AA−).

The stock price change around downgrades is considerably larger for the low-rated stocks than for the high-rated stocks. For instance, in the month before (after) the downgrade, the return on the lowest-rated stocks averages −7.96% (−5.64%). The average monthly return on the highest-rated stocks before (after) the downgrade is positive at 1.82% (0.16%). A similar return pattern prevails six months, one year, and two years around downgrades. In the year before (after) the downgrade, the return for the lowest-rated stocks is −50.15% (−3.78%), while the corresponding number for the highest-quality stocks is 7.68% (11.87%).

Panel A of Table 4 also documents the number of firms that are delisted across the various rating deciles. Over a 6 (12) [24] month period after a downgrade the number of delistings amongst the highest-rated stocks are 4 (8) [10] and are 167 (236) [314] amongst the lowest-rated stocks. Overall, the number of delistings are distinctly higher amongst the non-investment-grade firms, suggesting that many delistings are a consequence of

financial distress.

Panel B of Table 4 looks at the frequency of downgrades among investment-grade and non-investment-grade firms. In the investment (non-investment) grade group, there are a couple of firms which experience as many as 8 (7) downgrades over the period July 1985 to December 2003. For each category of overall number of downgrades, the average size per downgrade is much larger and the average time between downgrades is shorter among non-investment-grade firms. This means that high-credit-risk firms tend to have larger and more frequent downgrades than low-credit-risk firms. Also, for each particular number of downgrades, non-investment-grade firms experience much larger negative returns, both three and six months before and after the downgrade, than investment-grade firms.

The lowest rated stocks experience significant negative returns around downgrades, whereas the highest quality stocks realize positive returns. Could these major cross-sectional differences in the stock price response to credit rating downgrades drive the relation between returns and credit risk? We show below that the answer is indeed "Yes."

In particular, Table 5 repeats the analysis performed in Table 1 after excluding, for each downgrade-experiencing stock, six months of returns before and after a rating downgrade. Of course, our analysis here does not constitute a real-time trading strategy because we are looking ahead when discarding returns six months prior to a downgrade. However, our objective here is merely to examine the pattern of returns across the different credit risk portfolios around credit rating downgrades.[9]

Panel A of Table 5 shows that the highest-rated decile portfolio, C_1, averages a payoff of 1.42% whereas the return to the lowest-rated decile portfolio, C_{10}, is 1.35%. The return differential is economically small and statistically insignificant. This reduction in the payoff differential is primarily attributable to the lowest-rated decile portfolio. In Table 1, the C_{10} portfolio averages a raw return of 0.17% per month whereas the average return is 1.35% per month in non-downgrade periods.

Upon excluding returns around ratings downgrades, the $C_1 - C_{10}$ strategy yields a

[9]Note that often the rating agencies place firms on a credit watch prior to the actual downgrade. Vazza, Leung, Alsati, and Katz (2005) document that 64% of the firms placed on a negative credit watch subsequently experience a downgrade. That is to suggest that the downgrade event is largely predictable.

statistically insignificant 0.51% monthly payoff in non-January months and insignificant 0.14% during expansions. The cumulative six month return for the $C_1 - C_{10}$ portfolio is nine basis points per month. The cumulative twelve month return is a statistically insignificant 1.10% per month. These results strongly suggest that the low average returns to low-quality firms result from periods of worsening credit conditions.

Excluding six months of returns around downgrades amounts to excluding a total of 45,433 month-return observations ($45,433 = 12,652+9,784+14,117+8,880$, see last row of Panel B in Table 4). The total number of month-return observations in our sample is 434,746, as noted in the data section. The excluded observations thus represent 10.45% of the total month-return observations in our sample. In fact, the fraction of sample observations ultimately generating the credit risk effect is even smaller. In particular, the average return for the C_1 group during the entire sample is 1.34% (see Table 1) and it is slightly higher at 1.42% (see Table 5) during non downgrade periods. The corresponding quantities for the C_{10} group are 0.17% and 1.35%. Thus, the considerable decline in the return spread across the credit risk groups during periods of stable credit conditions is almost exclusively attributable to the C_{10} firms. Hence, the fraction of sample essentially generating the credit spread effect is about 4.29% [(9,784+8,880)/434,746].

We now turn to the Fama and MacBeth (1973) individual stock cross-sectional regressions described in equation (3). Panel B of Table 5 uses the CAPM for risk-adjustment and Panel C uses the Fama-French (1993) three factor model. The RATING coefficient is now statistically insignificant for both specifications, suggesting that the puzzling credit-risk-return relation is also statistically nonexistent for the non-downgrade periods.

Overall, our results show that the credit-risk-return relation derives from periods around credit rating downgrades, in which high-credit-risk firms experience large negative returns, while low-credit-risk stocks appear to have a negligible reaction. This differential response to credit rating downgrades ultimately generates the credit risk effect in the cross-section of stock returns.

2.2 Understanding the downgrade effect

We have shown that the credit rating effect in the cross-section of returns arises due to substantial negative returns to high-credit-risk stocks around rating downgrades. This differential response is further illustrated in Figure 1. Clearly, during periods of rating

downgrades the low credit rating portfolio, C_{10}, experiences returns that are uniformly lower than those of portfolio C_1. Moreover, the low-rated stocks earn negative returns over eight months after the downgrade. *So why do high- and low-credit-risk firms respond differently to downgrades?* We explore several potential sources.

From a theoretical perspective, following structural default risk models, first described by Merton (1974), the option to default is more valuable for high-credit-risk firms. Hence, an increase in the likelihood of default implied by a downgrade is likely to have a larger impact on the price of the default option, and hence on the price of the stock for the highest credit risk stocks. Next, we explore additional reasons for the lower returns to low-rated stocks around downgrades.

2.2.1 Fundamental Performance Around Downgrades

We argue that the lower returns of low-rated stocks around downgrades may partially be attributable to their fundamental performance during such periods. To investigate this, we examine a number of accounting ratios including sales growth, profit margin, net cash flows, interest coverage, and asset turnover. These operating and financial ratios are industry adjusted. The adjusted accounting ratios are obtained for each stock and we report the time-series averages of the cross-sectional median values. The industry adjustment involves subtracting the industry median ratio for the quarter from each firm's own quarterly ratio. Table 6 presents the quarterly operating and financial ratios for quarters $q-4$ through $q+4$ with the ratings downgrade occurring sometimes during the quarter q.

Panel A of Table 6 presents the industry-adjusted sales growth for the different rating-sorted portfolios. Sales growth is defined as the percentage growth in sales since the last quarter. For the lowest-rated portfolio, C_{10}, the industry-adjusted sales growth over two quarters just prior to the rating downgrade averages -0.38% $\left[\frac{(-0.09\%-0.67\%)}{2}\right]$. For the highest-rated stock portfolio, C_1, the average industry-adjusted sales growth in the two quarters just prior to the rating downgrade is -0.08%. In the two quarters after the rating downgrade (in quarters $q+1$ and $q+2$), the average industry-adjusted sales growth for the C_{10} (C_1) portfolio is -1.93% (0.16%). Clearly, the industry-adjusted sales growth of low-rated stocks is far lower than of high-rated stocks both before and after the rating downgrades. Moreover, for the high- (low-) rated stocks the sales growth improves

(deteriorates considerably) after the rating downgrade. This could occur because, as noted by Titman (1984), customers may abandon a firm in financial distress.

Panel B of Table 6 presents the industry-adjusted net profit margin for the different rating-sorted portfolios. Net profit margin is computed as the net income divided by sales. The average industry-adjusted net profit margin for the C_{10} (C_1) portfolio is -23.55% (1.12%) over the two quarters prior to the ratings downgrade and -30.31% (-0.01%) over the two quarters after the ratings downgrade. Once again, the industry-adjusted net profit margin of low-rated stocks is far lower than that of high-rated stocks both before and after the rating downgrades.

Panel C of Table 6 presents the industry-adjusted net cash flows for the different ratings sorted portfolios. Net cash flows are defined as the sum of net income and depreciation standardized by total assets. The average industry-adjusted net cash flow for the C_{10} (C_1) portfolio is -3.07% (0.41%) over the two quarters prior to the ratings downgrade and -3.86% (0.37%) over the two quarters after the ratings downgrade. As before, around downgrades the net cash flow for the low-rated stocks is substantially lower than industry counterparts while the cash flow for the high-rated stocks is higher. This could be a reflection of the lower profit margin and the lower sales growth of the low-rated stocks.

Panel D of Table 6 presents the industry-adjusted interest coverage ratio for the different ratings sorted portfolios. Interest coverage ratio is defined as the sum of interest expense and pretax income divided by interest expense. The average industry-adjusted interest coverage ratio for the C_{10} (C_1) portfolio is -3.47% (2.51%) over the two quarters prior to the ratings downgrade and -4.37% (1.85%) over the two quarters after the ratings downgrade. Note that the high-rated firms have an interest coverage ratio that is better than their industry peers whereas the low-rated stocks have a coverage ratio that is substantially worse than their industry counterparts, both before and after the ratings downgrade. While the interest coverage ratio deteriorates for the low- and the high-rated stocks, they remain better (worse) than the industry averages for the high- (low-) rated stocks.

Panel E of Table 6 presents the industry-adjusted total asset turnover for the different ratings sorted portfolios. Total asset turnover is defined as sales divided by total book assets. The average industry-adjusted total asset turnover for the C_{10} (C_1) portfolio is -3.12% (0.96%) over the two quarters prior to the ratings downgrade and -1.73%

(0.46%) over the two quarters after the ratings downgrade. Once again, it is clear that, around rating downgrades, sales per unit of assets is lower than the industry average for the low-rated firms and higher than the industry average for the high-rated firms.

Overall, the industry-adjusted operating and financial performance of low-rated stocks is uniformly worse than that of the high-rated stocks around rating downgrades. This poor performance may explain some of the low returns realized by low-rated stocks. However, rating changes are known to be sluggish. This sluggishness, combined with the drastic price declines prior to a downgrade, suggests that the market may already anticipate the documented poor operating and financial performance of low-rated stocks. If the poor performance is indeed fully anticipated it is unclear why returns are still negative after the downgrade.

We next analyze whether the poor fundamental performance of low-rated firms around credit rating downgrades is indeed anticipated by the market.

2.2.2 Is the deteriorating performance expected?

Analyst forecast revisions, forecast errors, and earnings surprises are natural candidates for examining whether the operating and financial performance of low-rated stocks is anticipated by the market.

Panel A of Table 7 presents the analyst forecast revisions for a year before and after the ratings downgrades.[10] Analyst forecast revisions are defined as the monthly change in the mean earnings-per-share (EPS) forecast for the fiscal year as a fraction of the absolute value of last month's EPS forecast. Whenever the forecast changes from one fiscal year to the next for any stock, the forecast revision for that stock is not included for that month.

The first result to note is that forecast revisions are mostly negative across all the different credit rating portfolios. This is consistent with the evidence that analyst forecasts are in general optimistic. It is also apparent that the forecast revisions for the low-rated stocks are more negative than those for the high-rated stocks both before and after credit rating downgrades. The average three month forecast revision for the low- (high-) rated stocks is -16.54% (-2.90%) just prior to the rating downgrade and -57.95% (-0.69%)

[10] Analyst forecasts are available at a monthly frequency from I/B/E/S.

just after the rating downgrade. After the rating downgrade, the forecast revisions increase in absolute value terms for the low-rated stocks, whereas revisions diminish for the high-rated stocks.

Panel B of Table 7 presents the earnings surprises for four quarters before and after the ratings downgrades. An earnings surprise is computed as the actual EPS on the quarterly announcement date less the last month's mean EPS forecast, standardized by the absolute value of the actual EPS. While each of the earnings surprise across all the credit rating sorted portfolios are negative possibly due to analyst optimism, it is clear that the earnings surprise for the low-rated stocks are more negative than those for the high-rated stocks. For instance, the earnings surprise for the low- (high-) rated stock portfolio is -154% (-22%) in the quarter before the downgrade and -114% (-23%) in the quarter after the downgrade.

Panel C of Table 7 presents the standardized unexpected earnings (SUE) for four quarters before and after the ratings downgrades. Once again, SUE has the same pattern as the earnings surprises and forecast revision. The SUE for low-rated stocks is lower than that for high-rated stocks. The SUE for the low- (high-) rated stock portfolio is -89% (-50%) in the six months before the downgrade and -97% (-44%) in the six months after the downgrade.

Overall, there are considerably larger negative earnings surprises for the low-rated stocks as compared to the high-rated stocks. This further explains the substantially worse negative returns realized by low-rated stocks around downgrades.

2.2.3 Selling pressure around downgrades

Given the substantial fundamental deterioration and negative market surprises among downgraded low-rated stocks, we next explore differences in market selling pressures as further potential sources of the differential response of low- and high-rated firms around downgrades. For this purpose, we investigate liquidity and institutional ownership around rating downgrades.

Panels A and B of Table 8 present the Amihud (2002) illiquidity measure around rating downgrades for firms in the ten rating-sorted groups. Consider first the illiquidity of NYSE-AMEX stocks in Panel A of Table 8. Illiquidity generally increases with credit

risk. For the lowest-rated stocks, illiquidity is higher after the rating downgrade than before, whereas the reverse applies to the highest-rated stocks. Moreover, illiquidity is 0.18 for C_1 and 13.05 for C_{10} during the month of downgrade. Observe from Panel B that also for Nasdaq stocks illiquidity is generally higher for the lowest-rated stocks as compared to the highest-rated stocks. This suggest that any institutional selling will have a stronger price impact on low-rated stocks than on their high-rated counterparts.

Panel C presents the institutional holdings for credit-rating-sorted portfolios around downgrades. At quarter $q-4$, institutions hold 44.61% of the high-rated stocks and only 26.92% of the low-rated stocks. Just before the rating downgrade in quarter q, institutions hold 44.94% of the high-rated stocks and only 22.05% of the low-rated stocks. In the first quarter, $q+1$, after the downgrade, institutions hold 44.60% (17.22%) and in quarter $q+3$, institutions hold 45.31% (13.90%) of the high- (low-) rated stocks.

That is, while institutional holdings of the low-rated stocks decline by about 50% around rating downgrades, there is hardly any change in their holdings of high-rated stocks. In fact, the decline in institutional holding occurs mainly for stocks rated less than investment grade, i.e., less than BBB−. This selling by institutions is most likely driven by the poor fundamental performance of low-rated stocks and by the fiduciary responsibilities of institutions that prompt them to disinvest their holdings of low-rated stocks. Institutional selling combined with high illiquidity is consistent with the strongly negative returns realized by low-rated stocks around downgrades.

In sum, the stronger response of high-credit-risk stocks to downgrades is driven by their higher sensitivity to increases in their default likelihood, the more substantial deterioration in their fundamental operating and financial performance, and the fact that such deterioration is not anticipated by the market. This process is exacerbated by the stronger selling pressure by institutions, who sell their losing high-credit-risk stocks that are highly illiquid.

2.3 Understanding the nature of mispricing around downgrades

As noted earlier, Hand, Holthausen, and Leftwich (1992) and Dichev and Piotroski (2001) have demonstrated considerable abnormal bond and stock price declines following rating downgrades. Likewise, we have documented price declines in the period around downgrades for our sample of rated stocks. Moreover, we have uncovered sub-

stantial cross-sectional differences in stock price responses to rating downgrades. The considerable stock price drop is prevalent mainly among low-quality stocks, whereas high-quality firms often realize positive returns around downgrades. This differential response of high- and low-credit-risk stocks to rating downgrades ultimately gives rise to the negative relation between credit risk and stock returns.

Indeed, Dichev and Piotroski (2001) argue that the poor returns following downgrades are attributable to underreaction to downgrade announcements. In the context of our paper, this potential underreaction does not trigger the return differential across the rating deciles. Instead, it is the low returns realized by the low-rated stocks around downgrades (both before and after) that give rise to the negative relation between ratings and returns. These low returns could have ocurred on the downgrade day with the market reacting fully to rating downgrades or the low returns could obtain over a longer period in the presence of potential underreaction. In either case, the credit risk effect would exist. This suggests that the negative credit-risk-return relation is not a manifestation of the previously documented underreaction to rating downgrades.

Our findings give rise to yet another puzzling question. In particular, low-rated stocks are more likely to be downgraded and even delisted. Then, why don't prices of low-rated stocks reflect the possibility of these undesirable outcomes? Put differently, why is there such a large and persistent mispricing amongst the low-rated stocks? The answer is twofold. First, due to high uncertainty among the lowest-rated stocks, investors may not be aware of the extent of mispricing and may not adjust their expectations to fully account for the likelihood of large losses from these stocks during downgrades. Second, it may be difficult for investors to correct the mispricing because of the difficulties in short selling shares of stocks that are highly illiquid. Indeed, we have shown that low-rated stocks are small, highly illiquid, and followed by very few analysts who constantly revise their earnings forecasts downwards.

We next examine the impact of the difficulties in short selling on the credit-risk effect. D'Avolio (2002) has suggested the following proxies for short sale constraints: (i) Institutional holdings, (ii) Share turnover, and (iii) Shares outstanding. Low institutional holdings and a low number of shares outstanding make it difficult to borrow stocks for short selling while low share turnover could lead to difficulties with the uptick rules when short selling. We sort stocks independently into ten credit rating portfolios and three portfolios sorted on the above characteristics in order to examine the impact

of low, medium, and high institutional holdings, turnover, and shares outstanding on the credit risk effect.

Table 9 presents the results. Consistent with the idea that short selling difficulties lead to mispricing, we find that the credit risk effect is prominent amongst stocks that have low institutional holdings, low turnover, and fewer shares outstanding. The credit risk effect declines monotonically as institutional ownership, turnover, and shares outstanding increase.

Table 10 documents the credit risk effect for various credit rating subsamples as we sequentially exclude the worst-rated stocks. We start with all firms in the sample where the return differential across the highest and lowest rating decile stocks is 1.16% per month, as already shown. Upon eliminating all stocks rated D from the sample the return differential across the highest- and lowest-rated stocks drops to 0.89% per month. Excluding all stocks rated CCC and below, the return differential across the lowest- and highest-rated stocks is no longer statistically significant at the 5% level. Strikingly, stocks rated CCC and below comprise 0.05% of the sample by market capitalization and 1.16% by the average number of firms per month. Excluding stocks rated BB− and below results in economically small return differential of 18 basis points per month. Stocks rated BB− and below comprise only 3.41% of the sample by market capitalization and 26% by the number of firms. Thus, if there is any mispricing it occurs in a very small number of low market capitalization stocks.[11]

Given that the credit risk effect is prominent in a very small sample of low-rated stocks, we cannot identify a pervasive distress factor that impacts the cross-section of stock returns. In addition, the credit risk effect seems to be consistent with rational pricing in the presence of narrowly-localized trading frictions.

3 Conclusions

This paper seeks a resolution to the puzzle that high-credit-risk stocks realize lower returns than low-credit-risk stocks. In theory, risk averse investors should require a positive risk premium for buying high-credit-risk stocks. Empirically, however, we find

[11] We have checked that this is not solely a small firm effect but is indeed related to the credit ratings. Results are available upon request.

that low-credit-risk stocks earn a return of 1.16% (7.60%) per month (year) higher than that earned by high-credit-risk stocks. This finding is robust to risk-adjusting returns using the CAPM and the Fama and French (1993) three factor model and is not an artifact of the known size, book-to-market, and momentum anomalies.

The difference in returns between high- and low-rated stocks derives from the period around credit rating downgrades, whereas there is no return differential during periods of stable or improving credit conditions. In essence, the credit risk effect is due to the differential response of high- and low-rated firms to rating downgrades. We find that the substantial negative returns of low rated stocks around downgrades arises due to the fact that the fundamental operating and financial performance of low-rated stocks is substantially worse than that of the high-rated stocks around downgrades.

More importantly, this deteriorating performance is unanticipated by financial market participants as evidenced by the substantial negative analyst revisions and considerable earnings surprises over the year around the downgrade. Institutions sharply decrease their holdings of the low-rated stocks around rating downgrades. Indeed, it is the differential impact of downgrades on high and low-credit-risk stocks which drives the credit risk effect.

This evidence apparently deepens the credit-risk-return puzzle. In particular, downgrades are much larger in magnitude and frequency and have a much stronger impact on low-rated stocks. Still, the prices of low-rated stocks persistently fail to incorporate the possibility of future downgrades. We document that this mispricing is driven by a sample of worst-rated stocks which comprises 3.4% of the market capitalization of rated stocks. Except for downgrade periods and for a small sample of highly illiquid, hard to short sell, and sparsely followed firms, there is no differential return across high and low-rated firms. Thus, it is unlikely that there is a pervasive distress factor that impacts the cross-section of stock returns. The credit risk effect does not seem to violate concepts of market efficiency in the presence of trading frictions.

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Table 1
Returns and Credit Rating

For each month, all stocks rated by Standard & Poor's are divided into decile portfolios based on their credit rating at time t. Stocks priced below \$1 at the beginning of the month are removed. For each credit rating decile, we compute the cross-sectional mean return for month $t+1$. PANEL A reports the average of these monthly means. PANEL B reports the average of the size, book-to-market, and momentum adjusted returns as in Daniel, Grinblatt, Titman, and Wermers (1997). The last column reports the difference between the return of the best rated versus the worst rated portfolios. All numbers are in percentages. The t-statistics for cumulative returns (last three rows) are Newey and West (1987) adjusted heteroscedastic-serial consistent t-statistics. The sample period is July 1985 to December 2003. The numeric S&P rating is presented in bold and is ascending in credit risk, i.e. 1=AAA, 2=AA+, 3=AA, ..., 21=C, 22=D.

PANEL A: Raw Returns

	Rating Decile (C1=Lowest , C10=Highest Risk)										
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C1-C10
Average	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-	
Rating	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12	
Overall	1.34	1.24	1.17	1.17	1.01	1.29	1.14	0.97	0.87	0.17	1.16
	(**4.93**)	(**4.54**)	(**3.73**)	(**3.88**)	(**3.25**)	(**4.03**)	(**3.00**)	(**2.24**)	(1.86)	(0.31)	(**2.55**)
Non-Jan	1.37	1.24	1.15	1.14	0.96	1.21	1.02	0.81	0.60	-0.34	1.71
	(**4.90**)	(**4.37**)	(**3.48**)	(**3.62**)	(**2.96**)	(**3.60**)	(**2.54**)	(1.82)	(1.24)	(-0.62)	(**3.98**)
Jan	0.93	1.23	1.41	1.58	1.49	2.28	2.53	2.66	3.79	5.93	-5.01
	(0.88)	(1.21)	(1.36)	(1.40)	(1.48)	(**2.03**)	(**2.18**)	(1.63)	(**2.18**)	(**2.50**)	(**-2.06**)
Exp	1.37	1.28	1.19	1.19	1.00	1.30	1.19	0.95	0.88	0.29	1.08
	(**4.96**)	(**4.59**)	(**3.70**)	(**3.97**)	(**3.18**)	(**4.04**)	(**3.15**)	(**2.25**)	(1.92)	(0.53)	(**2.30**)
Rec	0.91	0.72	0.99	0.96	1.13	1.17	0.58	1.22	0.78	-1.33	2.24
	(0.73)	(0.58)	(0.70)	(0.57)	(0.75)	(0.72)	(0.27)	(0.48)	(0.29)	(-0.45)	(1.15)
$r_{t+1:t+6}$	7.58	7.04	7.26	6.61	6.43	7.16	6.67	5.09	5.17	3.55	4.02
	(**7.95**)	(**7.96**)	(**7.59**)	(**6.79**)	(**6.27**)	(**6.54**)	(**5.23**)	(**3.31**)	(**3.23**)	(1.74)	(**2.43**)
$r_{t+1:t+12}$	14.59	13.29	14.02	13.01	11.80	13.60	12.03	9.91	9.36	7.00	7.60
	(**8.31**)	(**9.37**)	(**9.47**)	(**8.23**)	(**6.94**)	(**8.28**)	(**6.57**)	(**4.28**)	(**4.08**)	(**2.42**)	(**2.93**)
$r_{t+1:t+24}$	29.76	27.53	28.04	27.88	25.75	26.77	23.02	23.58	19.58	16.62	13.14
	(**12.59**)	(**14.98**)	(**15.62**)	(**15.04**)	(**13.61**)	(**16.91**)	(**12.94**)	(**9.06**)	(**8.87**)	(**6.25**)	(**5.09**)

PANEL B: Size, Book-to-Market, and Momentum Adjusted Returns

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C1-C10
Overall	0.07	0.01	0.06	0.01	-0.14	-0.04	-0.12	-0.30	-0.44	-0.86	0.94
	(0.82)	(0.11)	(0.89)	(0.18)	(**-2.22**)	(-0.68)	(-1.30)	(**-2.88**)	(**-4.18**)	(**-4.78**)	(**3.94**)
Non-Jan	0.17	0.09	0.12	0.05	-0.10	-0.04	-0.10	-0.27	-0.45	-1.01	1.18
	(1.91)	(1.24)	(1.68)	(0.77)	(-1.53)	(-0.58)	(-1.09)	(**-2.62**)	(**-4.15**)	(**-5.41**)	(**4.93**)
Jan	-0.98	-0.98	-0.58	-0.42	-0.59	-0.08	-0.26	-0.59	-0.32	0.77	-1.76
	(**-2.32**)	(**-3.58**)	(**-2.72**)	(-1.70)	(**-2.50**)	(-0.49)	(-0.96)	(-1.18)	(-0.76)	(1.27)	(-1.84)
Exp	0.08	-0.01	0.05	-0.00	-0.16	-0.05	-0.09	-0.31	-0.41	-0.79	0.87
	(0.85)	(-0.09)	(0.68)	(-0.01)	(**-2.44**)	(-0.83)	(-0.91)	(**-2.99**)	(**-3.87**)	(**-4.22**)	(**3.48**)
Rec	0.01	0.19	0.22	0.16	0.14	0.09	-0.50	-0.14	-0.70	-1.80	1.81
	(0.02)	(0.71)	(0.69)	(0.51)	(0.88)	(0.37)	(-1.63)	(-0.28)	(-1.57)	(**-2.56**)	(**2.28**)
$r_{t+1:t+6}$	0.28	-0.23	0.08	-0.12	-0.97	-0.48	-0.85	-1.96	-2.74	-3.40	3.68
	(1.33)	(-0.89)	(0.35)	(-0.59)	(**-4.87**)	(**-2.18**)	(**-2.69**)	(**-5.39**)	(**-9.11**)	(**-4.50**)	(**4.27**)
$r_{t+1:t+12}$	0.46	-0.28	0.10	-0.10	-1.87	-0.90	-1.82	-2.99	-4.02	-5.57	6.02
	(1.47)	(-0.65)	(0.29)	(-0.27)	(**-4.57**)	(**-2.22**)	(**-3.24**)	(**-4.42**)	(**-8.51**)	(**-4.79**)	(**4.55**)
$r_{t+1:t+24}$	0.23	-0.48	-0.37	0.03	-2.15	-1.64	-3.82	-3.10	-6.73	-8.93	9.16
	(0.77)	(-0.92)	(-0.82)	(0.08)	(**-4.66**)	(**-2.85**)	(**-5.77**)	(**-3.99**)	(**-15.10**)	(**-7.79**)	(**7.18**)

Table 2
Stock Characteristics by Credit Rating

For each month, all stocks rated by Standard & Poor's are divided into decile portfolios based on their credit rating at time t. Stocks priced below \$1 at the beginning of the month are removed. For each credit rating decile, we compute the cross-sectional median characteristic for month $t+1$. The table reports the average of these monthly means. The sample period is July 1985 to December 2003. The numeric S&P rating is presented in bold and is ascending in credit risk, i.e. 1=AAA, 2=AA+, 3=AA, ..., 21=C, 22=D. Illiquidity is computed, as in Amihud (2002), as the the absolute daily return divided by the total dollar trading volume for the day, averaged across all trading days of the month (multiplied by 10^6). Turnover is computed as the percent of shares outstanding traded in a particular month. Institutional share is the percentage of shares outstanding owned by institutions. Number of analysts represents the number of analysts following the firm. Analyst revisions is computed as the change in mean EPS forecast since last month divided by the absolute value of the mean EPS forecast last month. SUE [Standardized Unexpected Earnings] is the difference between the EPS reported this quarter and the EPS four quarters ago, divided by the standard deviation of actual EPS over the last eight quarters. CAPM alphas and betas are calculated by running individual time-series regressions of excess stock returns on the excess return of the market.

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Characteristics	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
Size (\$bil)	4.91	3.36	2.42	1.63	1.21	0.95	0.55	0.31	0.21	0.15
Book-to-Market Ratio	0.43	0.47	0.52	0.55	0.59	0.62	0.59	0.59	0.62	0.74
Price	45.99	38.54	34.53	30.65	27.56	24.53	18.52	13.73	10.78	7.38
Volume - NYSE/Amex (\$mil)	383.74	260.86	195.20	131.56	97.32	76.98	42.74	24.98	12.28	6.29
Volume - Nasdaq (\$mil)	108.42	41.23	39.70	46.23	47.34	93.65	36.56	24.48	21.73	17.30
Illiquidity-NYSE/Amex	0.05	0.07	0.09	0.11	0.14	0.18	0.34	0.50	0.74	1.01
Illiquidity - Nasdaq	0.58	1.04	1.19	0.43	0.61	0.60	0.82	0.88	0.89	0.96
Institutional Share (%)	50.02	50.51	50.64	52.18	53.81	51.60	47.80	43.27	36.47	25.18
Number of Analysts	19.20	16.04	13.57	11.66	10.19	9.52	7.48	5.70	4.73	3.98
Analyst Revisions (%)	-0.02	-0.03	-0.05	-0.08	-0.11	-0.18	-0.19	-0.11	-0.10	-0.21
SUE	0.06	0.12	0.04	0.01	0.02	0.02	0.01	-0.00	-0.02	-0.04
LT Debt/Equity	0.41	0.55	0.60	0.67	0.77	0.85	1.00	1.15	1.25	1.28
CAPM Alpha	0.43	0.44	0.44	0.43	0.42	0.38	0.37	0.35	0.28	-0.05
CAPM Beta	0.77	0.84	0.85	0.85	0.85	0.90	1.03	1.08	1.11	1.16

Table 3
Cross-Sectional Regressions of
Risk-Adjusted Returns on Characteristics

We run monthly cross-sectional regressions of returns, r_{it}, on the firm's lagged credit rating and other firm characteristics, $C_{i,t-2}$ (Size and BM are lagged as in Fama and French (1992)):

$$r_{it} = a_t + b_t Rating_{i,t-1} + c_t C_{i,t-2} + u_{it}$$

We remove stocks priced below \$1. The table presents the average slope coefficients, b_t and c_t, multiplied by 100. The sample t-statistics of these estimated coefficients are below in parentheses. PANEL A presents results from regressions of raw returns. The remaining PANELs, we first run time-series regressions of each stock return on market factors:

$$r_{it} = \alpha_i + \beta_i F_t + e_{it}$$

where F_t are the excess market return or the three Fama and French (1993) factors. The risk-adjusted return is the intercept and error term from these time-series regressions: $r^*_{it} = \alpha_i + e_{it}$, which we use as the dependent variable in the cross-sectional regressions. The sample period is Jul 1985-Dec 2003.

PANEL A: Raw Returns

	Rating_{t-1}	$\text{Log(Size}_{t-2})$	$\text{Log(BM}_{t-2})$	$r_{(t-7:t-2)}$	$\text{Log(Turnover}_{t-2})$ NYSE/AMEX	Nasdaq	SUE_{t-2}
1	-0.07 (**-2.01**)						
2		-0.06 (-0.92)	0.05 (0.64)	1.36 (**3.57**)	0.06 (0.52)	0.05 (0.44)	0.04 (**2.88**)
3	-0.08 (**-2.41**)	-0.05 (-1.00)	0.12 (1.30)	0.98 (**2.36**)	0.07 (0.79)	0.10 (1.03)	0.04 (**3.17**)

PANEL B: Returns Risk-Adjusted by the CAPM

	Rating_{t-1}	$\text{Log(Size}_{t-2})$	$\text{Log(BM}_{t-2})$	$r_{(t-7:t-2)}$	$\text{Log(Turnover}_{t-2})$ NYSE/AMEX	Nasdaq	SUE_{t-2}
1	-0.09 (**-2.82**)						
2		-0.04 (-0.72)	0.07 (0.95)	1.38 (**4.02**)	-0.05 (-0.67)	-0.05 (-0.68)	0.03 (**2.39**)
3	-0.10 (**-4.01**)	-0.08 (-1.82)	0.11 (1.37)	1.03 (**2.75**)	-0.01 (-0.19)	0.02 (0.23)	0.04 (**2.63**)

PANEL C: Returns Risk-Adjusted by the Fama and French (1993) Factors

	Rating_{t-1}	$\text{Log(Size}_{t-2})$	$\text{Log(BM}_{t-2})$	$r_{(t-7:t-2)}$	$\text{Log(Turnover}_{t-2})$ NYSE/AMEX	Nasdaq	SUE_{t-2}
1	-0.08 (**-4.63**)						
2		-0.03 (-1.08)	-0.04 (-0.70)	1.28 (**4.08**)	0.01 (0.25)	-0.02 (-0.34)	0.03 (1.89)
3	-0.09 (**-4.53**)	-0.05 (-1.73)	0.01 (0.11)	0.94 (**2.69**)	0.03 (0.57)	0.03 (0.39)	0.03 (**2.18**)

Table 4
Analysis of Downgrades

The table focuses on stocks with at least one credit rating downgrade. PANEL A analyzes downgrades by credit rating decile portfolios, sorted based on their rating at the end of the previous quarter, month $t-1$. We compute the number and average size of downgrades, as well as the average returns (in percentages) around downgrades, within each credit rating decile. Since rating data is available on a quarterly basis, the downgrade is assumed to happen during the second month of the quarter, $t+1$. The last three rows report the total number of delisted stocks following downgrades. PANEL B divides firms by number of downgrades and within each downgrade frequency group, analyzes investment-grade (IG) and non-investment grade (NIG) firms. The sample period is July 1985 to December 2003.

PANEL A: By Credit Rating Portfolio

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Number of Downgrades	326	349	352	457	380	397	433	394	398	910
Size of Downgrades	1.44	1.59	1.59	1.59	1.79	1.67	1.87	1.85	1.80	2.91
r_{t-1}	1.82	-1.13	-0.08	-2.41	-0.99	-1.09	-4.93	-5.67	-3.78	-7.96
r_t	0.96	1.74	1.26	0.97	-0.21	-0.41	0.57	-2.93	-1.32	-6.35
r_{t+1}	0.16	0.62	0.02	0.15	-1.58	-0.86	-1.20	-3.07	-3.23	-5.64
$r_{t-3:t-1}$	2.13	-0.93	1.57	-3.31	-0.77	-3.92	-10.65	-11.11	-12.11	-17.97
$r_{t+1:t+3}$	2.68	3.99	3.15	2.93	-0.24	1.31	-0.30	-2.75	-4.68	-6.98
$r_{t-6:t-1}$	4.52	-1.49	4.16	-2.56	-4.54	-8.90	-16.95	-19.95	-19.67	-31.65
$r_{t+1:t+6}$	5.52	6.60	5.74	6.08	1.04	4.72	0.88	-2.05	-2.26	-7.91
$r_{t-12:t-1}$	7.68	0.31	3.97	-3.60	-7.66	-13.41	-25.02	-31.61	-32.61	-50.15
$r_{t+1:t+12}$	11.87	13.50	13.83	11.55	5.61	7.60	2.54	-2.47	1.82	-3.78
$r_{t-24:t-1}$	16.08	5.65	8.49	-3.11	-7.50	-10.41	-30.08	-37.33	-42.52	-59.98
$r_{t+1:t+24}$	20.53	29.07	26.44	27.53	24.78	18.07	11.50	-0.88	16.74	13.02
Delisted over $(t+1:t+6)$	4	6	13	8	7	6	17	27	32	167
Delisted over $(t+1:t+12)$	8	10	20	18	14	23	32	52	67	236
Delisted over $(t+1:t+24)$	16	18	31	47	31	43	56	84	101	314

PANEL B: By Frequency of Downgrades

# of Downgr. per Firm	Firms with N Downgr.		Size of Each Downgr.		Months Between Downgr.		Returns Around Each Downgrade							
							$r_{t-3:t-1}$		$r_{t:t+3}$		$r_{t-6:t-1}$		$r_{t:t+6}$	
	IG	NIG	IG	NIG	IG	NIG	IG	NIG	IG	NIG	IG	NIG	IG	NIG
N=1	507	527	2.07	2.31			-1.94	-15.61	4.75	-0.01	-0.87	-23.92	6.88	5.28
N=2	279	285	1.70	2.36	40	19	0.06	-14.07	5.74	-11.36	-1.55	-26.55	8.24	-12.91
N=3	178	145	1.52	2.34	35	19	-0.20	-13.62	2.23	-11.41	-2.88	-26.14	4.44	-13.16
N=4	98	53	1.42	2.13	32	20	-2.62	-10.63	2.01	-11.81	-3.67	-18.39	5.07	-14.01
N=5	33	19	1.34	2.26	32	16	-5.53	-7.89	0.48	-14.71	-8.03	-14.97	4.22	-16.85
N=6	13	5	1.44	2.70	28	26	-2.61	-33.11	-2.52	-13.60	-2.77	-38.65	2.87	-0.53
N=7	9	2	1.19	2.57	28	26	1.48	-12.94	1.61	-7.78	-3.76	-14.88	5.93	-11.55
N=8	2		1.13		9		-2.55		-0.35		-0.78		-3.79	
Observations							6,333	4,746	8,244	5,455	12,652	9,784	14,117	8,880

Table 5
Returns and Credit Rating
After Removing Returns Around Downgrades

For each month, all stocks rated by Standard & Poor's are divided into decile portfolios based on their credit rating at time t. Stocks priced below \$1 at the beginning of the month are removed. For each credit rating decile, we compute the cross-sectional mean return for month $t+1$. PANEL A reports the average of these monthly means over the entire sample period after eliminating firms 6 months around rating downgrades $(t-6:t+6)$. The downgrade is assumed to occur in the 2nd month of the quarter. The t-statistics for cumulative month returns (last three rows) are Newey and West (1987) adjusted heteroscedastic-serial consistent t-statistics. For PANELs B and C, we regress each stock return on the excess market return:

$$r_{it} = \alpha_i + \beta_i F_t + e_{it}$$

where F_t are either the CAPM excess market return (PANEL B) or the three Fama and French (1993) factors (PANEL C). The risk-adjusted return is the intercept and error term from these time-series regressions: $r^*_{it} = \alpha_i + e_{it}$. In each month, we regress the risk-adjusted returns, r^*_{it}, on a constant, the firm's credit rating, $CR_{i,t-1}$ and other firm characteristics, $C_{i,t-1}$ (note that the size and BM variables are lagged as in Fama and French (1992)):

$$r^*_{it} = a_t + b_t RATING_{i,t-1} + c_t C_{i,t-1} + u_{it}$$

The table presents the average slope coefficients, b_t and c_t, in the cross-sectional regressions, averaged across all months in the sample, and multiplied by 100. The t-statistics are the sample t-statistics of these estimated coefficients. The sample period is July 1985 to December 2003.

PANEL A: Returns After Eliminating 6 Months Around Downgrades

	Rating Decile (C1=Lowest , C10=Highest Risk)										
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C1-C10
Average	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-	
Rating	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12	
Overall	1.42	1.34	1.25	1.29	1.19	1.49	1.46	1.34	1.18	1.35	0.08
	(**5.33**)	(**4.99**)	(**4.04**)	(**4.35**)	(**4.04**)	(**4.86**)	(**3.94**)	(**3.19**)	(**2.58**)	(**2.53**)	(0.17)
Non-Jan	1.47	1.35	1.23	1.28	1.15	1.42	1.39	1.20	0.95	0.96	0.51
	(**5.32**)	(**4.84**)	(**3.78**)	(**4.11**)	(**3.73**)	(**4.41**)	(**3.54**)	(**2.76**)	(**2.00**)	(1.79)	(1.21)
Jan	0.88	1.19	1.45	1.51	1.60	2.28	2.30	2.87	3.58	5.70	-4.82
	(0.85)	(1.19)	(1.45)	(1.40)	(1.63)	(**2.21**)	(**2.13**)	(1.83)	(**2.25**)	(**2.55**)	(**-2.09**)
Exp	1.46	1.36	1.26	1.30	1.18	1.49	1.48	1.30	1.19	1.33	0.14
	(**5.37**)	(**4.95**)	(**3.98**)	(**4.39**)	(**3.91**)	(**4.82**)	(**4.00**)	(**3.17**)	(**2.69**)	(**2.52**)	(0.31)
Rec	0.90	1.03	1.08	1.20	1.33	1.53	1.26	1.90	1.05	1.64	-0.74
	(0.74)	(0.89)	(0.81)	(0.75)	(1.00)	(0.98)	(0.63)	(0.76)	(0.38)	(0.54)	(-0.37)
$r_{t+1:t+6}$	8.01	7.26	7.17	7.22	7.13	8.02	7.93	7.14	6.89	7.92	0.09
	(**8.72**)	(**9.03**)	(**8.13**)	(**8.21**)	(**7.98**)	(**8.08**)	(**6.80**)	(**5.00**)	(**4.59**)	(**4.49**)	(0.06)
$r_{t+1:t+12}$	14.75	12.91	13.35	13.23	12.64	14.78	13.91	13.53	12.14	13.65	1.10
	(**8.92**)	(**10.91**)	(**10.32**)	(**10.36**)	(**9.02**)	(**10.11**)	(**8.63**)	(**6.52**)	(**6.08**)	(**5.67**)	(0.46)
$r_{t+1:t+24}$	28.42	25.82	26.54	27.57	27.22	28.77	26.06	29.36	25.41	25.30	3.12
	(**14.71**)	(**17.27**)	(**16.90**)	(**18.04**)	(**17.82**)	(**20.90**)	(**16.57**)	(**12.60**)	(**13.29**)	(**11.62**)	(1.35)

Table 5(continued)

PANEL B: Cross-Sectional Regressions of Returns Risk-Adjusted by the CAPM

	Rating_{t-1}	$\text{Log(Size}_{t-2})$	$\text{Log(BM}_{t-2})$	$r_{(t-7:t-2)}$	$\text{Log(Turnover}_{t-2})$ NYSE/AMEX	Nasdaq	SUE_{t-2}
1	-0.01 (-0.32)						
2		-0.09 (-1.53)	0.16 (**2.24**)	0.85 (**2.54**)	0.03 (0.34)	0.03 (0.34)	0.02 (1.79)
3	-0.04 (-1.85)	-0.07 (-1.57)	0.24 (**3.15**)	0.13 (0.37)	0.03 (0.41)	0.06 (0.81)	0.02 (1.22)

PANEL C: Cross-Sectional Regressions of Returns Risk-Adjusted by the Fama and French (1993) Factors

	Rating_{t-1}	$\text{Log(Size}_{t-2})$	$\text{Log(BM}_{t-2})$	$r_{(t-7:t-2)}$	$\text{Log(Turnover}_{t-2})$ NYSE/AMEX	Nasdaq	SUE_{t-2}
1	-0.00 (-0.19)						
2		-0.07 (**-2.68**)	0.06 (1.16)	0.76 (**2.53**)	0.11 (1.83)	0.07 (1.09)	0.01 (1.19)
3	-0.03 (-1.83)	-0.04 (-1.22)	0.14 (**2.34**)	0.06 (0.19)	0.09 (1.49)	0.10 (1.23)	0.01 (0.79)

Table 6
Characteristics Before and After Downgrades

All numbers represent the time-series mean of the cross-sectional median industry-adjusted characteristics around rating downgrades. The downgrade is assumed to happen in the 2nd month of the quarter. The industry adjustment represents subtracting from each firm ratio the industry median ratio for the industry to which the firm belongs. Sales Growth is defined as the percentage growth in sales since last quarter. Net Profit Margin is Net Income divided by Sales. Net Cash Flows are defined as the sum of Net Income and Depreciation standardized by Total Assets. Interest Coverage is the sum of Interest Expense and Pretax Income divided by Interest Expense. Total Asset Turnover is Sales over Total Assets. All numbers, except for the Interest Coverage Ratio are multiplied by 100. The sample period is July 1985 to December 2003. The numeric S&P rating is presented in bold and is ascending in credit risk, i.e. 1=AAA, 2=AA+, 3=AA, ..., 21=C, 22=D. $t = 0$ is the quarter of downgrade.

Panel A: Industry-Adjusted Sales Growth (×100)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Quarter	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-4	-0.32	-0.14	0.05	-0.00	-0.21	-0.22	-0.52	-0.78	-0.46	0.93
-3	0.29	0.19	-0.08	-0.55	-1.15	-0.82	-0.05	1.19	-0.47	-0.34
-2	-0.25	0.01	-0.28	-0.49	-0.48	-0.58	-0.54	-0.56	-0.50	-0.09
-1	0.09	-0.44	-0.57	-0.41	-0.13	-0.51	-0.43	-0.94	-0.84	-0.67
0	-0.31	0.05	0.62	0.36	-0.31	-0.69	-1.44	-0.56	-1.08	-0.22
1	0.45	0.09	-0.45	-0.67	-0.69	-0.86	-0.39	-0.18	-0.16	-1.71
2	-0.14	0.42	0.15	0.14	0.27	0.48	-0.57	-0.64	-1.33	-2.14
3	-0.06	-0.41	-0.56	-0.60	-0.15	-0.33	-0.43	-0.69	-1.14	-1.41
4	-0.80	-0.11	0.10	-0.19	-0.54	-0.41	-0.87	-0.97	-1.09	-0.36

Panel B: Industry-Adjusted Net Profit Margin (×100)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Quarter	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-4	1.43	0.65	0.15	-1.17	-0.68	-1.27	-2.80	-16.01	-8.39	-11.02
-3	1.57	0.22	-0.08	-1.29	-2.04	-2.66	-4.38	-5.30	-7.83	-16.06
-2	0.62	0.25	-0.19	-1.43	-2.23	-3.06	-4.06	-6.30	-9.84	-18.95
-1	1.61	0.23	-0.35	-2.40	-3.74	-5.31	-6.01	-10.40	-19.35	-28.14
0	-0.05	-0.89	-1.89	-3.67	-5.56	-6.54	-14.26	-16.29	-43.62	-35.52
1	0.53	-1.30	-2.26	-3.23	-5.07	-6.62	-9.23	-12.84	-38.55	-30.02
2	-0.55	-1.73	-1.46	-2.82	-3.71	-5.03	-7.28	-8.25	-108.81	-30.60
3	0.42	-1.34	-1.43	-2.29	-3.67	-6.31	-12.57	-14.41	-14.71	-22.23
4	-0.92	-1.59	-0.68	-1.86	-3.31	-4.46	-6.65	-10.75	-12.87	-23.76

Table 6(continued)

Panel C: Industry-Adjusted Net Cash Flows (×100)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Quarter	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-4	0.62	0.16	0.14	-0.14	-0.21	-0.35	-0.77	-1.52	-1.72	-1.69
-3	0.64	0.24	0.16	-0.08	-0.36	-0.59	-1.14	-1.39	-1.53	-1.96
-2	0.32	0.16	0.14	-0.10	-0.35	-0.45	-0.96	-1.20	-1.71	-2.25
-1	0.50	0.11	-0.02	-0.34	-0.58	-1.11	-1.27	-1.97	-2.49	-3.89
0	0.12	-0.20	-0.32	-0.50	-0.72	-1.08	-2.26	-2.64	-4.75	-6.14
1	0.37	-0.16	-0.25	-0.53	-0.94	-1.03	-2.21	-2.39	-2.87	-4.02
2	0.37	-0.25	-0.12	-0.33	-0.69	-0.96	-1.42	-1.18	-3.48	-3.69
3	0.30	-0.07	-0.25	-0.37	-0.61	-0.89	-2.03	-2.00	-2.24	-3.08
4	0.34	-0.00	0.03	-0.22	-0.72	-0.79	-1.24	-2.02	-2.13	-2.93

Panel D: Industry-Adjusted Interest Coverage Ratio

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Quarter	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-4	2.99	1.18	0.72	0.31	-0.29	-0.58	-1.91	-2.63	-2.28	-2.54
-3	2.64	1.03	0.73	0.15	-0.72	-1.10	-4.80	-2.18	-2.34	-2.75
-2	2.59	0.84	0.50	-0.01	-0.57	-0.85	-1.80	-2.29	-2.56	-3.04
-1	2.42	0.84	0.20	-0.14	-1.07	-1.78	-2.73	-2.65	-3.41	-3.89
0	1.02	0.44	-1.71	-1.56	-1.98	-2.08	-6.51	-3.60	-4.26	-4.94
1	1.88	0.38	-0.66	-1.09	-1.92	-1.80	-3.09	-3.40	-3.96	-4.90
2	1.82	0.00	-0.38	-0.76	-1.46	-1.60	-1.99	-3.26	-3.47	-3.84
3	1.61	0.22	-0.45	-1.09	-1.40	-1.51	-2.48	-3.10	-3.05	-3.54
4	1.42	0.14	-0.01	-0.63	-1.29	-1.56	-2.30	-2.96	-2.70	-3.36

Panel E: Industry-Adjusted Total Asset Turnover (×100)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Quarter	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-4	0.97	0.13	0.51	1.76	1.73	1.58	-1.32	-1.17	-2.20	-2.73
-3	0.94	0.19	0.57	1.52	0.44	0.65	-0.85	-1.16	-2.00	-3.10
-2	1.15	0.40	0.30	1.33	0.45	0.33	-1.65	-1.27	-1.96	-2.92
-1	0.76	0.19	0.13	1.24	0.63	0.47	-0.80	-1.23	-1.97	-3.32
0	0.91	0.32	0.61	1.54	0.91	0.70	-1.94	-1.21	-1.29	-1.91
1	0.54	-0.04	0.48	0.68	0.45	-0.45	-1.48	-1.10	-0.91	-1.49
2	0.37	0.27	0.57	1.38	0.13	-0.35	-1.30	-1.32	-1.59	-1.96
3	0.26	-0.19	0.02	1.46	1.22	0.14	-0.19	-0.02	-0.56	-1.91
4	-0.17	-0.59	0.34	2.15	1.69	2.03	-0.59	0.73	0.16	-0.89

Table 7
Analyst Revisions and Earning Surprises Before and After Downgrades

All numbers represent the time-series mean of the cross-sectional median characteristics around rating downgrades. The downgrade is assumed to happen in the 2nd month of the quarter. Revisions are defined as the monthly change in mean forecast for EPS for the next fiscal year over the absolute value of last month's mean EPS forecast. Earning Surprise is the actual EPS at the end of the next fiscal year minus this month's mean EPS forecast for the end of the fiscal year, standardized by the absolute value of the actual EPS. Standardized unexpected earnings (SUE) for a firm is computed as the actual earnings announced this month less the earnings four quarters ago. This earnings change is standardized by its standard deviation estimated over the prior eight quarters. All numbers are in percentages. The sample period is July 1985 to December 2003. The numeric S&P rating is presented in bold and is ascending in credit risk, i.e. 1=AAA, 2=AA+, 3=AA, ..., 21=C, 22=D. $t = 0$ is the month of downgrade.

Panel A: Analyst EPS Forecast Revisions (×100)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Month	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-12	-3.13	-3.26	-2.16	-1.57	-2.71	-4.82	-8.30	-11.80	-14.94	-18.51
-11	-1.13	-0.59	-1.16	-1.69	-2.97	-3.76	-6.32	-9.91	-8.37	-22.14
-10	-0.66	-1.24	-1.32	-1.94	-2.39	-3.92	-5.21	-13.88	-21.54	-18.99
-9	-1.04	-2.13	-1.53	-1.88	-4.56	-9.05	-12.52	-10.80	-17.26	-32.46
-8	-1.56	-1.03	-1.21	-2.07	-4.08	-5.45	-5.54	-7.95	-9.07	-32.85
-7	-0.64	-0.80	-1.09	-2.35	-3.07	-4.22	-20.13	-14.67	-16.36	-10.72
-6	-0.89	-0.92	-1.14	-2.78	-6.49	-6.87	-12.88	-15.08	-23.05	-17.87
-5	-0.41	-0.66	-0.89	-2.16	-2.96	-3.08	-10.28	-9.78	-11.51	-14.76
-4	-2.73	-1.04	-1.89	-3.93	-2.96	-8.06	-6.25	-57.72	-72.85	-6.39
-3	-2.74	-0.43	-2.43	-3.89	-5.97	-9.55	-19.16	-42.25	-20.26	-36.01
-2	-3.75	-0.97	-0.84	-2.19	-5.03	-7.84	-10.46	-13.64	-23.92	-9.36
-1	-2.20	-1.49	-1.56	-2.55	-7.21	-32.98	-6.50	-8.14	-8.20	-4.25
0	-2.18	-2.20	-2.29	-3.68	-10.05	-17.97	-11.98	-21.67	-43.88	-12.77
1	-0.81	-1.55	-1.32	-2.55	-9.46	-6.81	-16.62	-16.25	-47.46	-49.44
2	-1.41	-15.31	-1.58	-2.21	-2.90	-8.20	-9.81	-13.30	-13.48	-58.52
3	0.15	-1.04	-2.84	-6.46	-17.98	-3.98	-8.62	-8.60	-16.39	-65.88
4	-0.49	-1.23	-1.25	-4.06	-6.58	-6.13	-14.22	-42.85	-30.00	3.68
5	-5.80	-3.26	-1.69	-2.60	-7.02	-1.52	-9.60	-49.75	-60.77	-22.97
6	-0.80	-2.70	-1.68	-1.75	-1.68	-12.97	-14.32	-17.85	42.19	-3.22
7	-1.52	-0.74	-1.75	-2.18	-4.30	-1.98	-19.63	-13.33	-11.50	-71.13
8	-1.26	-3.26	-2.57	-1.49	-5.61	-7.61	-2.64	-4.73	-3.18	0.23
9	-0.35	0.60	-9.51	-0.66	-9.03	-6.94	-6.00	-11.65	-23.94	-1.69
10	-0.91	-1.62	-0.88	-1.52	-9.42	-7.12	-3.32	-6.99	-10.08	-8.03
11	-0.98	-36.46	-0.98	-0.66	-1.68	-3.41	-5.23	-9.41	-2.97	-0.89
12	0.34	-1.50	-0.88	-1.14	-1.82	-3.22	1.46	-3.09	-5.33	-10.37

Table 7(continued)

Panel B: Earning Surprises (Actual-Forecasted)/Abs(Actual) (×100)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Month	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-12	-5.71	-5.92	-7.76	-14.31	-35.37	-53.61	-48.21	-357.66	-459.30	-67.24
-11	-5.40	-5.17	-6.87	-12.23	-38.67	-63.32	-73.90	-375.49	-473.47	-63.54
-10	-7.16	-6.15	-12.43	-16.19	-45.49	-64.95	-79.83	-250.46	-390.67	-64.37
-9	-7.25	-5.49	-17.73	-16.12	-32.70	-70.74	-76.50	-190.10	-284.34	-80.40
-8	-14.92	-4.82	-15.54	-14.70	-26.63	-59.98	-75.23	-143.78	-195.51	-77.21
-7	-24.95	-10.87	-21.92	-22.00	-24.88	-54.79	-84.62	-157.11	-204.10	-116.69
-6	-24.16	-11.25	-20.40	-22.44	-23.51	-53.10	-82.04	-156.02	-233.89	-164.81
-5	-20.12	-10.38	-18.63	-18.12	-24.94	-53.18	-89.42	-114.04	-169.11	-160.73
-4	-23.25	-10.08	-20.50	-39.55	-67.57	-50.32	-91.12	-112.82	-167.85	-166.78
-3	-24.06	-11.48	-17.97	-36.25	-63.87	-69.53	-92.16	-112.70	-170.53	-168.13
-2	-21.67	-10.70	-16.22	-34.49	-60.91	-67.65	-81.84	-59.79	-103.38	-161.35
-1	-20.33	-12.96	-21.35	-45.74	-81.21	-83.23	-81.85	-81.03	-124.45	-132.27
0	-21.64	-14.69	-21.65	-45.02	-75.45	-88.09	-79.89	-98.90	-93.51	-117.59
1	-21.17	-12.89	-19.39	-42.93	-71.17	-84.71	-75.21	-98.64	-94.22	-107.49
2	-25.53	-19.30	-25.94	-50.20	-76.91	-109.18	-109.09	-109.31	-110.80	-112.90
3	-22.92	-17.64	-25.15	-43.27	-88.27	-108.57	-105.92	-102.13	-103.06	-122.08
4	-21.22	-18.46	-22.90	-41.35	-86.04	-103.19	-99.34	-94.71	-100.00	-108.68
5	-60.40	-24.96	-25.32	-47.38	-89.59	-106.09	-97.19	-98.52	-98.89	-98.82
6	-56.82	-24.01	-24.54	-43.90	-101.96	-106.99	-101.03	-94.21	-91.58	-59.54
7	-33.76	-23.01	-24.47	-41.52	-104.86	-101.29	-96.26	-86.55	-84.60	-54.19
8	-26.89	-31.37	-37.88	-43.13	-78.39	-100.18	-99.52	-83.43	-76.19	-49.73
9	-26.65	-29.36	-31.67	-37.79	-72.55	-79.47	-92.83	-78.04	-64.74	-48.05
10	-19.82	-42.32	-27.31	-29.44	-71.55	-74.28	-79.59	-77.19	-64.76	-52.01
11	-18.12	-44.23	-26.03	-27.84	-71.34	-77.98	-68.58	-68.51	-44.56	-29.24
12	-16.96	-40.93	-22.57	-28.89	-72.17	-76.09	-59.49	-71.68	-40.16	-23.05

Table 7(continued)

Panel C: SUE (×100)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Month	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-12	13.27	-42.85	-31.86	-48.17	-64.19	-71.58	-77.40	-65.53	-46.23	-98.80
-11	-21.61	-30.93	-94.51	-123.19	-94.71	-75.80	-56.08	-142.42	-143.01	-93.66
-10	14.01	-27.73	-8.20	-12.21	-51.84	-34.53	-51.02	-50.49	-40.03	-64.98
-9	-56.32	-20.70	-68.92	-72.48	-69.23	-24.24	-107.86	-105.23	-99.11	-106.37
-8	-67.45	23.12	-15.41	-93.76	-90.46	-98.05	-182.24	-163.39	-100.29	-104.40
-7	6.21	-22.22	-44.68	-24.96	-34.39	-42.64	-81.39	-47.60	-49.61	-57.02
-6	-32.06	-30.87	-41.02	-31.84	-38.34	-106.26	-130.37	-84.79	-73.55	-82.92
-5	21.17	3.83	7.65	-93.82	-104.72	-40.24	-97.45	-179.23	-117.64	-83.27
-4	11.15	-5.85	-26.88	-32.31	-44.13	-27.45	-56.45	-58.25	-37.99	-92.93
-3	-107.03	-100.00	-46.86	-109.10	-104.59	-100.65	-99.43	-120.46	-163.75	-80.33
-2	-144.50	-21.42	-91.36	-168.71	-54.63	-61.30	-183.02	-220.00	-178.56	-86.89
-1	-49.89	-48.22	-21.65	-24.24	-51.57	-28.83	-154.39	-167.33	-92.94	-109.83
0	-98.67	-78.14	-192.83	-174.61	-185.79	-125.89	-145.06	-151.77	-100.48	-136.43
1	-56.21	-15.68	-52.72	-103.27	-126.75	-172.15	-82.35	-74.90	-175.26	-165.20
2	-29.39	-33.43	-26.47	-40.96	-36.62	-87.61	-77.33	-61.36	-67.46	-88.05
3	-68.15	-34.00	-80.26	-95.96	-77.84	-73.92	-36.85	-79.79	-80.37	-153.11
4	-93.94	-81.48	-70.20	-72.47	-123.83	-55.55	-172.09	-152.18	-125.63	-113.39
5	3.01	-34.62	-28.19	-19.64	-12.98	-22.21	-40.14	-32.95	-53.50	-15.02
6	-21.64	-11.24	-34.32	-32.74	-40.44	-46.30	-37.80	-123.91	-59.88	-47.39
7	11.80	-23.14	35.17	-71.04	-76.56	-21.89	-40.56	-164.24	-28.37	-45.88
8	-8.99	-18.96	-10.47	14.93	8.19	25.38	-27.92	-66.42	-1.60	2.94
9	8.18	-12.82	-10.14	-14.56	-24.91	-39.07	-8.54	-15.42	-60.83	-47.26
10	114.77	-41.24	-41.06	-23.60	-12.31	-52.79	6.01	-22.84	-46.28	-84.59
11	18.81	15.02	-4.03	1.76	3.19	11.88	5.82	35.61	25.25	21.92
12	25.28	-0.53	-3.16	30.39	-90.16	-74.05	12.77	19.06	4.49	-17.43

Table 8
Market Characteristics Before and After Downgrades

All numbers represent the time-series mean of the cross-sectional median market characteristics around rating downgrades. Institutional Holdings is defined as the number of shares held by institutions divided by the total number of shares outstanding. Illiquidity is computed as in Amihud (2002). The sample period is July 1985 to December 2003. The numeric S&P rating is presented in bold and is ascending in credit risk, i.e. 1=AAA, 2=AA+, 3=AA, ..., 21=C, 22=D. $t = 0$ is the month of downgrade.

Panel A: Illiquidity (NYSE/AMEX)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Month	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-12	0.19	0.33	0.11	0.15	0.16	0.33	0.51	1.23	2.30	2.27
-11	0.21	0.53	0.10	0.14	0.17	0.31	0.45	0.93	2.66	2.33
-10	0.27	0.66	0.11	0.15	0.19	0.41	0.56	0.96	2.18	2.60
-9	0.24	0.63	0.11	0.16	0.17	0.42	0.55	1.50	1.48	2.10
-8	0.16	0.67	0.11	0.14	0.14	0.28	0.61	0.95	1.71	2.41
-7	0.23	0.30	0.11	0.15	0.17	0.33	0.64	1.37	2.56	3.05
-6	0.26	0.61	0.11	0.15	0.16	0.32	0.53	1.68	2.09	2.42
-5	0.18	0.36	0.10	0.16	0.15	0.29	0.56	2.35	2.32	3.60
-4	0.22	0.45	0.11	0.14	0.16	0.32	0.62	1.29	2.18	3.27
-3	0.20	0.55	0.10	0.13	0.16	0.34	0.52	1.59	2.49	3.14
-2	0.19	0.52	0.10	0.14	0.15	0.31	0.55	1.16	1.99	3.08
-1	0.16	0.47	0.12	0.14	0.16	0.30	0.47	1.99	3.29	3.78
0	0.18	0.32	0.10	0.13	0.15	0.32	0.49	1.20	2.95	13.05
1	0.15	0.48	0.14	0.15	0.13	0.32	0.52	1.46	4.64	6.44
2	0.14	0.61	0.11	0.14	0.15	0.33	0.53	1.65	2.06	4.74
3	0.11	0.32	0.13	0.14	0.15	0.34	0.76	1.79	3.02	8.51
4	0.13	0.36	0.16	0.16	0.15	0.34	0.79	1.68	2.39	6.13
5	0.11	0.65	0.15	0.15	0.16	0.37	0.76	1.39	2.17	7.24
6	0.12	0.27	0.21	0.15	0.18	0.32	0.77	1.66	2.02	5.65
7	0.11	0.18	0.24	0.13	0.17	0.35	0.62	1.40	2.66	7.61
8	0.11	0.24	0.15	0.14	0.18	0.43	1.13	2.05	2.57	6.97
9	0.11	0.31	0.19	0.14	0.17	0.41	2.19	2.18	2.81	7.94
10	0.09	0.61	0.20	0.13	0.17	0.37	2.70	2.58	2.69	6.93
11	0.10	0.33	0.32	0.15	0.19	0.42	2.74	2.72	2.40	8.31
12	0.10	0.64	0.23	0.16	0.21	0.41	0.91	2.24	2.70	6.86

Table 8(continued)

Panel B: Illiquidity (NASDAQ)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Month	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-12	4.05	19.89	14.07	6.11	4.92	3.01	1.40	4.02	5.38	3.70
-11	3.20	4.69	4.09	6.96	5.04	3.80	2.79	4.21	6.27	5.62
-10	3.72	36.31	25.06	7.04	5.25	2.76	1.70	7.87	6.22	7.34
-9	3.30	4.48	4.37	11.60	7.10	2.93	2.03	4.39	6.81	9.12
-8	1.48	2.43	3.47	2.37	1.93	2.49	1.91	3.03	8.64	16.08
-7	2.77	2.65	4.39	5.65	3.67	2.11	1.45	6.23	5.82	9.30
-6	1.80	2.95	3.89	9.43	4.97	2.35	1.25	3.04	5.75	7.33
-5	2.09	4.19	5.06	11.38	6.25	3.70	1.92	8.25	10.89	10.49
-4	3.03	4.25	5.22	7.98	4.29	2.57	2.34	6.38	9.28	10.19
-3	1.99	3.56	7.34	15.86	8.24	3.16	1.23	4.28	7.12	11.26
-2	2.75	4.73	2.66	6.01	3.36	2.11	1.71	2.97	9.75	6.79
-1	2.92	5.47	5.01	9.23	5.53	2.41	2.17	5.31	8.27	8.35
0	2.65	4.82	5.86	7.75	3.18	4.26	3.24	4.47	8.13	8.79
1	3.23	4.25	7.50	7.23	3.14	2.61	1.40	4.11	5.60	5.10
2	2.87	6.43	6.77	4.12	2.43	3.31	2.53	7.38	16.10	10.95
3	2.03	6.83	9.42	16.93	6.92	2.46	2.29	3.48	11.32	11.56
4	3.08	4.82	4.83	12.03	6.76	4.41	2.45	4.29	11.16	7.68
5	2.30	6.09	6.24	21.35	11.17	3.06	3.12	5.49	13.62	6.82
6	3.40	5.73	4.70	23.64	12.71	3.36	2.32	5.68	11.28	8.44
7	6.16	5.51	3.92	32.92	17.07	3.12	3.81	4.29	14.71	9.99
8	3.38	4.43	4.40	26.66	14.03	3.53	4.96	3.96	12.88	10.96
9	3.02	4.96	9.86	16.81	8.35	4.12	2.81	2.89	8.74	9.94
10	2.96	5.09	7.83	16.11	8.03	3.98	3.36	3.25	5.80	6.01
11	4.43	6.29	12.23	20.05	7.60	3.10	4.64	3.99	8.72	13.40
12	4.44	5.17	14.41	27.25	9.58	3.50	5.07	2.83	7.63	9.77

Panel C: Institutional Holdings ($\times 100$)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	AA	A+	A	A-	BBB+	BBB	BB+	BB-	B+	B-
Quarter	2.58	4.61	5.85	6.99	8.19	9.42	10.96	12.40	13.50	16.12
-4	44.61	49.99	51.77	52.40	50.59	47.18	44.65	41.59	33.68	26.92
-3	44.42	49.89	51.24	52.83	49.98	46.98	44.22	39.30	31.76	25.05
-2	44.56	50.25	55.05	52.35	49.65	46.48	43.16	37.57	29.80	24.42
-1	44.94	50.27	51.92	52.16	48.81	46.31	41.84	35.11	27.76	22.05
0	44.37	49.13	52.05	51.85	49.25	45.83	40.67	32.84	26.19	20.52
1	44.60	49.32	51.75	50.97	48.36	45.17	38.48	31.22	23.71	17.22
2	44.10	50.04	51.06	50.83	48.87	44.86	37.97	28.25	21.41	15.19
3	45.31	50.97	51.64	50.94	48.57	44.03	36.58	27.09	19.96	13.90
4	45.09	50.83	51.72	50.71	48.94	45.26	36.45	26.90	20.36	15.61

Table 9
Returns Independently Sorted by
Credit Rating and Difficulty of Short-Selling

For each month, all stocks rated by Standard & Poor's are divided into portfolios independently sorted based on ten credit rating and three short-sale constraint proxies groups at time t. Each subsection of the table refer to a particular stock characteristic which has been explicitly identified in D'Avolio (2002) as leading to high short-sale constraints: low IO (institutional ownership), low share Turnover, and low float (shares outstanding). Stocks priced below \$1 at the beginning of the month are removed. For each independently sorted portfolio, we compute the cross-sectional mean return for month $t+1$. The table reports the average of these monthly means. The last column reports the difference between the return of the best rated versus the worst rated portfolios. All numbers are in percentages. The t-statistic is in parenthesis. The sample period is July 1985 to December 2003.

	Rating Decile (C1=Lowest , C10=Highest Risk)										
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C1-C10
IO											
Low	1.27	1.16	1.10	1.06	1.19	1.29	1.14	1.02	1.08	-0.06	1.33
	(**4.60**)	(**4.57**)	(**4.24**)	(**3.94**)	(**4.11**)	(**3.81**)	(**2.87**)	(**2.39**)	(**2.32**)	(-0.11)	(**2.86**)
Medium	1.37	1.41	1.41	1.24	1.20	1.23	1.28	1.27	1.30	0.75	0.62
	(**4.76**)	(**4.94**)	(**4.70**)	(**4.23**)	(**3.82**)	(**3.49**)	(**3.20**)	(**2.86**)	(**2.58**)	(1.20)	(1.16)
High	1.28	1.36	1.37	1.29	1.32	1.26	1.11	0.92	0.65	0.40	0.89
	(**4.11**)	(**4.17**)	(**4.07**)	(**3.79**)	(**3.75**)	(**3.40**)	(**2.60**)	(1.91)	(1.16)	(0.56)	(1.47)
Turnover											
Low	1.20	1.23	1.19	1.09	1.11	1.13	0.88	0.85	0.65	-0.12	1.32
	(**4.92**)	(**4.72**)	(**4.54**)	(**4.31**)	(**4.11**)	(**3.78**)	(**2.51**)	(**2.23**)	(1.56)	(-0.27)	(**3.42**)
Medium	1.32	1.43	1.35	1.16	1.24	1.30	1.20	1.09	0.98	0.39	0.93
	(**4.60**)	(**4.74**)	(**4.43**)	(**3.82**)	(**3.98**)	(**3.94**)	(**3.04**)	(**2.48**)	(**2.04**)	(0.68)	(1.93)
High	1.37	1.28	1.34	1.36	1.35	1.33	1.23	1.17	1.11	0.49	0.88
	(**4.11**)	(**3.77**)	(**3.71**)	(**3.75**)	(**3.76**)	(**3.45**)	(**2.74**)	(**2.30**)	(**1.97**)	(0.71)	(1.66)
Shares											
Low	1.20	0.93	0.89	0.89	1.00	1.03	0.79	0.66	0.62	-0.04	1.24
	(**4.67**)	(**3.74**)	(**3.48**)	(**3.30**)	(**3.26**)	(**3.08**)	(**2.10**)	(1.65)	(1.43)	(-0.08)	(**2.92**)
Medium	1.26	1.20	1.12	1.05	1.09	1.17	1.14	1.01	0.84	0.27	0.99
	(**4.97**)	(**4.54**)	(**3.81**)	(**3.66**)	(**3.64**)	(**3.41**)	(**2.81**)	(**2.17**)	(1.62)	(0.42)	(1.85)
High	1.33	1.40	1.39	1.31	1.43	1.50	1.44	1.74	1.93	1.83	-0.49
	(**4.58**)	(**4.59**)	(**4.40**)	(**4.09**)	(**4.27**)	(**4.16**)	(**3.13**)	(**3.11**)	(**2.97**)	(**2.37**)	(-0.75)

Table 10
Credit Risk Effect over Different Subsamples

For each month, all stocks rated by Standard & Poor's are divided into decile portfolios based on their credit rating at time t. Stocks priced below \$1 at the beginning of the month are removed. The credit risk effect is computed as the return of the best rated decile portfolio minus the return of the worst rated decile portfolio. Each subsequent row in the table represents a monotonically decreasing sample of stocks obtained by sequentially excluding firms with the worst credit rating. The first column of the table reports the credit risk effect for each subsamples of firms. t-statistics are in parentheses. The second column shows the market capitalization of the given subsample as a percentage of the overall sample of S&P rated firms. The third column provides the percentage of firms represented by each subsample. Sample: July 1985 - December 2003.

Stock Sample	Credit Risk Effect	Percentage of Market Cap	Percentage of Firms
AAA-D (All firms)	1.16 (**2.55**)	100.00	100.00
AAA-C	0.89 (**2.17**)	99.98	99.59
AAA-CC	0.89 (**2.17**)	99.98	99.58
AAA-CCC-	0.85 (**2.09**)	99.97	99.46
AAA-CCC	0.79 (**1.97**)	99.97	99.27
AAA-CCC+	0.64 (1.62)	99.95	98.84
AAA-B-	0.59 (1.51)	99.89	98.00
AAA-B	0.51 (1.37)	99.62	95.96
AAA-B+	0.50 (1.47)	99.06	91.95
AAA-BB-	0.34 (1.12)	98.03	82.37
AAA-BB	0.18 (0.67)	96.59	73.93
AAA-BB+	0.21 (0.86)	95.05	67.27
AAA-BBB-	0.18 (0.80)	92.99	61.79
AAA-BBB	0.19 (0.94)	89.22	53.70
AAA-BBB+	0.27 (1.36)	83.07	43.51
AAA-A-	0.08 (0.46)	75.81	34.91
AAA-A	0.02 (0.13)	68.13	26.68
AAA-A+	-0.17 (-0.46)	52.15	16.35

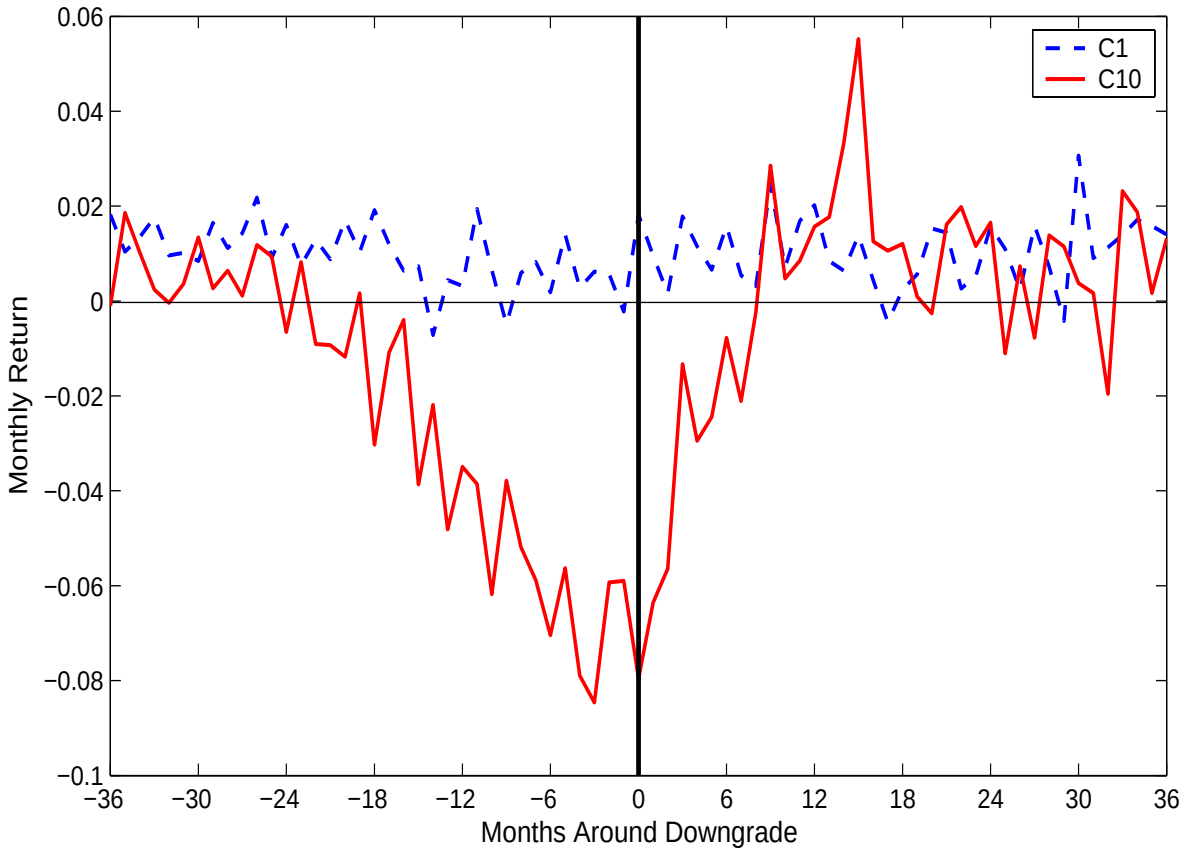

Figure 1. Returns around Downgrades. The figure presents monthly returns of the best (C1) and worst (C10) decile portfolio, formed on the basis of firm S&P credit rating, around periods of rating downgrades. Month 0 is the month of downgrade.