Credit Ratings and The Cross-Section of Stock Returns

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Preliminary

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Abstract

Firms with low credit risk realize higher returns than firms with high credit risk. This credit risk effect in the cross-section of stock returns is a puzzle because investors appear to pay a premium for bearing credit risk. This paper shows that the negative relation between credit risk and returns is statistically and economically significant only during periods of credit rating downgrades. During such periods, low quality firms experience substantial deterioration in their operating and financial performance, and are sold by institutional investors leading to considerable price drops. The deteriorating fundamental performance is unanticipated by the market as evidenced by the large negative earnings surprises and analyst forecast revisions. In contrast, average returns do not differ across credit risk groups in periods of stable or improving credit conditions, which account for about 90% of the sample observations.

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, Dichev (1998) and Campbell, Hilscher, and Szilagyi (2005), among others, demonstrate that credit risk is *negatively* related to the cross-section of stock returns. This evidence is anomalous because investors appear to pay a premium for bearing credit risk.

This paper examines the credit risk effect in the cross-section of stock returns during credit cycles. Our analysis is based on a comprehensive sample of 3,578 NYSE, AMEX, and NASDAQ firms rated by S&P over the July 1985-December 2003 period.[1] We first show that the return differential between the highest and lowest rated stock decile is 1.16% (7.60%) over a one month (year) period after the portfolio formation date, and we confirm the negative relation between credit ratings and returns using Fama and MacBeth (1973) cross-sectional regressions of monthly individual stock returns on credit rating. Moreover, 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 negative relation between credit risk and returns is robust to adjustments for risk as well as for firm characteristics.

The negative relation between credit risk and average returns *crucially* depends on credit cycles. In particular, the relationship prevails due to returns over downgrade periods extending from six months before to six months after credit rating downgrades. Also, it is the returns on low rated stocks that drive the negative relation between credit risk and returns. 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. In particular, from an economic perspective, trading strategies that sell low credit risk and buy high credit risk stocks during non-downgrade periods provide small and insignificant payoffs. Moreover, credit rating is statistically and economically insignificant in monthly cross sectional regressions during non-downgrade periods.

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

Indeed, previous work (e.g., Hand, Holthausen, and Leftwich (1992) and Dichev and Piotroski (2001)) documents considerable abnormal price declines following rating downgrades. Relative to this body of work, however, we uncover substantial cross section differences in stock price responses to rating downgrades. The considerable stock price drop following rating downgrades is apparent among low quality stocks, whereas high quality firms often realize positive returns around rating 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.

The significant credit risk effect during periods of worsening credit conditions reveals yet another puzzle. In particular, we show that rating downgrades are larger in magnitude and frequency among low rated than among high rated firms. Hence, one would expect lower rated stocks to command even higher expected returns than higher rated stocks during periods of worsening credit conditions. However, high credit risk stocks continue to realize far lower returns than low credit risk stocks for upto two years following a downgrade.

To understand the stock price responses to credit rating downgrades among the credit risk groups, we analyze the operating and financial performance of firms around downgrades. Specifically, we examine industry-adjusted accounting ratios including sales growth, profit margin, net cash flow, interest coverage, and asset turnover. The evidence suggests that the fundamental performance of the low rated stocks is substantially worse than that of the high rated stocks both before and after a rating downgrade. The deteriorating fundamental performance or low rated stocks around downgrades is consistent with the severe decline in their prices.

More importantly, the deteriorating performance of high credit risk stocks both before and after rating downgrades is not anticipated by the market as evidenced by 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. Moreover, institutions reduce their holdings of the low rated stocks around rating downgrades possibly due to their fiduciary responsibilities. One reason for why analysts and institutions are surprised by the poor fundamental performance of the low rated stocks may be due to the fact that financial distress itself may prompt suppliers, customers, creditors and employees to abandon these firms in larger than expected numbers around downgrades. Given the significantly

higher illiquidity of low rated stocks, the institutional selling activity, following the negative surprises among high credit risk stocks, may be the cause of the substantial stock price drop, and ultimately the negative relation between credit risk and 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, at the beginning of each month, the stock price be 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 below \$1. Throughout the paper, we use delisted returns whenever appropriate. 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 those stocks that are rated by Standard & Poor's, leaving us with 3,578 rated stocks over the July 1985 through December 2003 period. The total number of month-return observations in our sample is 434,746. The beginning of our sample is determined by the first time firm ratings by Standard & Poor's become available on the COMPUSTAT tapes. This investment universe of 3,578 rated firms forms the basis for our analysis of the relation between firm credit rating and average returns.

The S&P issuer rating used here is an essential component of our analysis. Note that 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, this rating is based on the overall quality of the firm's outstanding debt, either public or private. Before 1998, the issuer rating represents a select subsample of company bonds. After 1998, it represents all company debt. This rating is available from COMPUSTAT on a quarterly basis starting in 1985.

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, the investment-grade threshold) and the median is 9 (BBB).

2 Results

To confirm the credit risk return puzzle, we present in Panel A of Table 1 the time-series average monthly return of decile portfolios sorted, every month, based on the firm's credit rating. Portfolio returns are the equally weighted averages of individual stock returns in the month subsequent to portfolio formation. The mean 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 the lowest rating portfolio, $C_1 - C_{10}$, is a statistically and economically significant 1.16% per month. This return differential persists over several months. Specifically, the $C_1 - C_{10}$ cumulative return over the six (12) [24] months subsequent to portfolio formation is 4.02% (7.60%) [13.14%]. The $C_1 - C_{10}$ returns are even higher in non-January months (1.71% per month) and negative in January (-5.01% per month). The average return is 1.08% per month during expansions and 2.24% (albeit statistically insignificant) during recessions.[3]

The overall evidence is consistent with prior work and it represents an anomalous pattern in the cross-section of returns because investors are expected to demand higher risk premia and thus higher expected returns for stocks with higher credit risk. However, the empirical evidence is exactly the opposite. Even if credit risk does not measure systematic risk and can be diversified away, the results are anomalous because with diversifiable risk the return differential between high and low rated stocks should be zero. Instead the monthly return differential is 1.16%.

Before we continue with the analysis, it should be noted that a large fraction of the

[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]The business cycle expansions and recessions are as defined by the NBER. See www.nber.org/cycles.html.

$C_1 - C_{10}$ payoff is generated by the lowest rated stock portfolio C_{10}. For instance, while the overall $C_1 - C_{10}$ return is 1.16% per month, the return to the portfolio $C_1 - C_9$ is less than half that amount at 0.47% per month. Moreover, the cumulative six (12) [24] month return for the $C_1 - C_9$ portfolio is only 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 effects in the cross-section of stock returns. Following Daniel, Grinblatt, Titman, and Wermers (1997), we adjust individual stock returns for size, book-to-market ratio, and past returns. In particular, we form $5 \times 5 \times 5$ size, book-to-market, and past-twelve-month return sorted portfolios. We 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. Notice that the $C_1 - C_{10}$ portfolio still realizes a payoff which is significant at 0.94% per month, 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, slightly 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 non-January months. The cumulative characteristic-adjusted return generated by the $C_1 - C_{10}$ portfolio over six (12) [24] months subsequent to the portfolio formation date is 3.68% (6.02%) [9.16%]. Overall, the $C_1 - C_{10}$ characteristic-adjusted returns are significantly positive. That is, adjusting for the traditional anomalies does not resolve the puzzle that higher credit risk stocks earn lower returns, suggesting that the credit risk effect in the cross-section of return is unrelated to the size, book-to-market, and momentum effects.

Table 2 documents the average characteristics of the stocks in the different decile portfolios sorted by credit rating. The average characteristic is first calculated each month for each stock. The portfolio characteristic is the equally weighted average each month. Finally, these monthly averages are averaged over time to obtain the portfolio characteristics that are reported. Firm size, as measured by market capitalization, decreases monotonically with credit risk. 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. Average stock price also decreases monotonically from $46 for the highest rated stocks to $7 for the lowest rated stocks. The book-to-market ratio increases with credit risk probably due to the low market values of the low rated stocks. Analyst following decreases monotonically with credit risk from about 19 for the high rated stocks to 4 for the low rated stocks. Institutions hold far fewer shares of the low rated stocks. Institutional shareholding amounts to over 50% for the high rated stocks and about 25% for the low rated stocks. Analyst revisions and earnings surprises are far lower and negative for the low rated stocks as compared to the high rated stocks. Surprisingly, turnover is higher for the low rated stocks, especially amongst firms listed on Nasdaq.

Low rated stocks are more illiquid than the high rated stocks. Illiquidity is computed as in Amihud (2002). Amihud (2002)'s illiquidity measure is the average daily price impact of order flow and 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, $DVOL_{itd}$ 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. We compute Amihud (2002)'s illiquidity measure at the monthly frequency. We require at least ten days with trades each month.[4]

We next confirm that the credit risk effect is significant in explaining cross-sectional differences in individual stock returns, by running cross-sectional regressions of stock returns on credit rating, while controlling for additional firm characteristics. Each month, we run the following cross-sectional Fama and MacBeth (1973) regressions:

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

where $RATING$ represents the numerical score attached to firm rating. Recall that 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.

[4]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.

The firm characteristics included are (i) Size: Firm size measured as the market value of equity, (ii) BM: Ratio of book value of equity to market value of equity calculated following the procedure in Fama and French (1992), (iii) Turnover: Measured as the ratio of monthly share trading volume to the number of shares outstanding, (iv) $R_{(t-7:t-2)}$: Cumulative return over the last six months. All the characteristics are lagged by two months relative to the month in which the dependent variable is measured. Turnover is measured separately for NYSE-AMEX and Nasdaq stocks. Panel A of Table 3 presents the results. We report the time-series averages of the coefficients $\hat{b}_t$ and $\hat{c}_t$. The standard errors of these estimators are obtained from the time-series of the monthly estimates.

Panel A in Table 3 shows that the coefficient of the lagged credit rating variable is -0.07 ($t - stat = -2.01$). In other words, a one point higher numerical credit score (one point worse credit rating) produces 7 basis points lower returns per month on average. The second regression in Panel A excludes the credit rating and retains only the lagged characteristics as independent variables. Of the characteristics, only the past six month return has a significant impact on the cross-section of returns. The third regression contains both credit rating and firm characteristics. It is evident that the negative credit risk–return relation is significant and of the same magnitude whether or not firm characteristics are included as control variables.

Indeed, results based both on raw and characteristic-adjusted portfolio returns and on individual stock returns do conclusively suggest that higher rated stocks realize higher returns than lower rated stocks. However, credit risk is just one measure of the firm's overall risk. While credit risk measures the risk that creditors may not get repaid, it should be related to a firm's overall 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 check next. We now ensure that risk as measured using the standard asset pricing models does not capture the negative relation between credit risk and returns. We risk-adjust raw returns using the Capital Asset Pricing Model (CAPM) of Sharpe (1964) and Lintner (1965) as well as the Fama and French (1993) three factor model.

Our risk adjustment is based on cross-sectional asset-pricing tests with individual stocks. Following 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 characteristics. Under the null of exact pricing, credit rating as well as equity characteristics should be statistically insignificant in the cross-sectional regressions. The cross sectional regressions take the form

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

where $\hat{\beta}_{jk}$ is the beta estimated by a first-pass time-series regression of the firm's stock return on the asset pricing factors over the entire sample period with non-missing returns data.[5]

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 leads to 9 basis points lower risk-adjusted returns. As with raw returns, the credit rating coefficient remains unchanged controlling for size, book-to-market, past returns, and turnover.

In Panel C of Table 3, the individual stock returns are risk-adjusted using the Fama and French (1993) factors.[6] The RATING coefficient is -0.08 as the equity characteristics are absent from the monthly cross-sectional regressions and -0.09 when those characteristics serve as control variables.

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, the puzzling evidence that lower rated, high credit risk stocks earn lower returns than higher rated, low credit risk stocks is robust to adjusting raw returns by common risk factors as well as equity characteristics.

[5]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 any of the results (see also Avramov and Chordia (2006)).

[6]We have also checked, (results available upon request) that the results are the same when adjusting with the Fama-French (1993) factors augmented with the momentum factor.

2.1 The impact of downgrades

Thus far we have documented that the credit rating level is negatively related to the cross section of returns. Credit rating downgrade events enable one to delve deeper into the economics of the credit-risk-return relation. Our focus on downgrades is motivated by previous work, which demonstrates an asymmetric response of future returns to credit rating changes. In particular, both Hand, Holthausen, and Leftwich (1992) and Dichev and Piotroski (2001) document considerable abnormal price declines following rating downgrades but no price advances following upgrades. We extend this analysis by looking at the differential response of high and low credit risk stocks to rating downgrades. Since we have data on credit rating from the quarterly COMPUSTAT tapes, we only know the quarter in which the downgrade occurred and we do not know the exact month of the downgrade. In the following analysis, we assume that the downgrade occurs in the second month of quarter, i.e., in the middle of the quarter. Qualitatively, the results do not change when we assume that the downgrade occurred in the first or the 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. The number of downgrades in the highest rated decile is 326 while the number in the lowest rated decile is much larger at 910. Not only is the number of downgrades larger amongst the low rated stocks but also the downgrade magnitude is larger. The average size of a downgrade amongst the low rated stocks is 2.91 points (moving from B- to CCC-), whereas the average downgrade amongst the high rated stocks is 1.44 points (moving from AA to AA-).

The stock price decline around downgrades is considerably larger in absolute value terms 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 only 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 figure for the highest quality stocks is 7.68% (11.87%). Apart from the return differential across the highest and lowest rated stocks, there is a substantial difference in returns of

investment grade (BBB- and higher) and non-investment grade (BB+ and lower) firms. This difference is specially stark before the downgrade. For instance, the C6 portfolio with an average rating of BBB has returns in the one {three} (six) [twelve] months before the downgrade of -1.09% {-3.92%} (-8.90%) [-13.41%] whereas the C7 portfolio with an average rating of BB+ has far lower returns of -4.93% {-10.65%} (-16.95%) [-25.02%]. This return differential is much larger than that across the C4 and the C6 portfolios or across the C7 and the C9 portfolios. Non-investment grade firms do seem to experience larger consequences of financial distress than investment grade firms.

Panel B of Table 4 looks at the frequency of downgrades among investment-grade and non-investment grade firms. Investment (non-investment) grade firms in our sample experience up to 8 (7) downgrades over the period July 1985 to December 2003. For each category of overall number of downgrades, the size of each downgrade is always much larger and the time between downgrades is always shorter among non-investment grade firms. This means that higher credit risk firms tend to have larger and more clustered downgrades than lower 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.

Clearly, 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? This is what we investigate next.

Table 5 repeats the analysis performed in Table 1 after excluding stock returns around rating downgrades. More specifically, when calculating the raw returns to the decile ratings portfolios we exclude six months of returns before and after a rating downgrade for any stock that experiences such downgrade. We note that this cannot 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 cycles. We are not trying to implement a trading strategy.[7] We are only trying to understand the anomalous returns to the cross-section of credit rating portfolios.

Panel A of Table 5 shows that the highest rated decile portfolio, C_1, averages a

[7]However, we should point out that often the rating agencies place firms on a credit watch prior to the actual downgrade.

payoff of 1.42% whereas the return to the lowest rated decile portfolio, C_{10} is 1.35%. The eight basis point monthly difference is statistically insignificant. This reduction in the payoff 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. After eliminating returns around downgrades, the return on the C_{10} portfolio is 1.35% per month.

Upon excluding returns around ratings downgrades, the return differential between the high rated and the low rated decile portfolios $C_1 - C_{10}$ is a statistically insignificant 0.51% per month in the non-January months and insignificant fourteen basis points 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 for $C_1 - C_{10}$ is a statistically insignificant 1.10% per month. These results strongly suggest that the low returns to low rated stocks result from periods of worsening credit conditions.

It can be noted that removing six months of returns around credit rating downgrades removes 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 (see Data section). The excluded observations thus represent 10.45% of the total month-return observations in our sample. The credit risk effect does not exist for the remaining 90% of the sample.

We now turn to the Fama and MacBeth (1973) individual stock cross-sectional regressions as 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, 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. It is this differential response to credit rating downgrades that generates the credit risk effect on the cross section of stock returns. At the time of downgrade, this differential response could be derived from the fact that the option to default is likely to be in-the-money for the highest 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.

2.2 Understanding the post downgrade effect

We have shown that the credit rating effect on the cross section of returns can be explained by the large negative returns to high credit risk stocks around rating downgrades. However, this only serves to deepen the puzzle. In particular, a ratings downgrade implies an increase in credit risk. Hence, the expected return of stocks that experience a downgrade should increase even more than before the downgrade. However, our findings indicate that the cumulative stock returns of the highest credit risk stocks are negative for upto twelve months following a downgrade and lower than those of the lowest credit risk stocks for upto twenty-four months. The monthly returns around downgrades are also illustrated in Figure 1. Clearly, around downgrades the low credit rating portfolio, C_{10}, experiences returns that are far lower than those of portfolio C_1. Moreover, the low rated stocks earn negative returns over eight months after the downgrade.

In the next section, we analyze the attributes of such low returns to low rated stocks following downgrades.

2.2.1 Fundamental Performance Around Downgrades

To understand the persistence of returns around ratings downgrades for the highest and the lowest rating decile portfolios we analyze the fundamental performance of firms. In particular, 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 from each firm's accounting ratio. Table 6 presents the quarterly operating and financial ratios for quarters q-4 through q+4 with the ratings downgrade occurring sometime during the quarter q.

Panel A of Table 6 presents the industry adjusted sales growth for the different ratings 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% ((-0.09%-0.67%)/2). In contrast, 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 that experiences financial distress.

Panel B of Table 6 presents the industry adjusted net profit margin for the different ratings 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. One reason for profit margins to be low may be due to extensive discounting to be able to sell products.

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 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 industry average for the low rated firms and higher than industry average for the high rated firms.

Overall, the industry adjusted operating and financial performance of low rated stocks is far worse than that of the high rated stocks around rating downgrades and this poor performance coincides with the low returns earned by low rated stocks. This return differential around rating downgrades captures the overall low returns to low rated stocks. However, rating changes are known to be sluggish. This sluggishness combined with the drastic decline in returns prior to a downgrade suggests that the market may anticipate the poor operating and financial performance of low rated stocks. If the poor performance is anticipated then we should not see the low returns after the downgrade.

In the next section, we analyze whether the poor fundamental performance of firms around downgrades is anticipated by the market.

2.2.2 Earnings surprises

In this section we examine earnings surprises and analyst forecast revisions around ratings downgrades to investigate 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.[8] 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 the forecast revisions are all mostly

[8]Analyst forecasts are obtained from IBES and are available at a monthly frequency.

negative for the different stock rating portfolios. This is consistent with the fact that analyst forecasts are in general optimistic. Even though most forecast revisions are negative, there seems to be a clear pattern in forecast revisions. 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%) just after the rating downgrade. After the rating downgrade, the forecast revision deteriorates for the low rated stocks and improves 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 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. A firm's SUE is computed as the actual earnings less the earnings four quarters ago, standardized by the standard deviation of earnings computed over the past eight quarters. 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 the results suggest that the earnings surprises are more negative for the low rated stocks as compared to the high rated stocks. This is consistent with the more drastic deterioration in the fundamental operating and financial performance of low rated stocks around the rating downgrades. Moreover, the earnings surprises and forecast revisions combined with the low returns after downgrades suggests that, at the time of the downgrade, the market does not anticipate the subsequent deterioration in the fundamental performance of the low rated firms.

We now relate the earnings surprises and the fundamental performance of the low rated stocks to the firm attributes and returns. Panels A and B of Table 8 present Amihud (2002)'s illiquidity measure around rating downgrades for firms in the various rating-sorted deciles.

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 but the reverse is true for the highest rated stocks. For the NASDAQ stocks in Panel B, we also note that illiquidity is generally higher for the lowest rated stocks as compared to the highest rated stocks.

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+4, institutions hold 45.09% (15.61%) of the high (low) rated stocks. Thus, while there is hardly any change in the institutional holding of high rated stocks, their holding of the low rated stocks declines substantially around rating downgrades. In fact, the decline in institutional holding occurs mainly for stocks rated less than investment grade, ie., 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 exit low rated stocks. Institutional selling in the face of high illiquidity probably causes the strongly negative returns of low rated stocks around downgrades.

In sum, the fundamental operating and financial performance of high credit risk firms continues to deteriorate after credit rating downgrades, possibly because customers, suppliers, creditors and employees abandon financially distressed firms in larger than expected numbers. The returns of high credit risk firms continue to be negative following downgrades possibly because the rapid deterioration in fundamental performance is unanticipated by the market. This process is exacerbated by the much larger illiquidity of high credit risk stocks and the institutional selling precipitated by the downgrade.

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 that low credit risk stocks earn a return of 1.16% (7.60%) per month (year) higher than that of the high credit risk stocks. This result 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 around periods of stable or improving credit conditions. This evidence only serves to deepen the credit-risk-return puzzle. In particular, expected returns of low rated stocks should be even higher after a downgrade than before. In fact, the expected returns of low rated stocks should be relatively higher than those of the high rated stocks after a downgrade because the size of the downgrade is on average larger for the low rated stocks. To resolve this apparently deeper puzzle we examine the fundamental performance of firms around ratings downgrades.

We find that the fundamental operating and financial performance of low rated stocks is substantially worse than that of the high rated stocks following downgrades. Moreover, this deteriorating performance is unanticipated by market participants as evidenced by the substantial negative analyst revisions and earnings surprises over the year following the downgrade. Institutions decrease their holdings of the low rated stocks both before and after a ratings downgrade. Institutional selling is most likely driven by the poor fundamental performance and fiduciary responsibilities that limit investment in poor quality stocks. This institutional selling further exacerbates the significant decline in prices of low rated stocks around rating downgrades and it is the differential impact on the low rated stocks that explains the puzzle that high credit risk stocks earn lower returns than low credit risk stocks.

References

Amihud, Yakov, 2002, Illiquidity and Stock Returns: Cross-Section and Time Series Effects, *Journal of Financial Markets* 5(1), 31–56.

Avramov, Doron, and Tarun Chordia, 2006, Asset Pricing Models and Financial Market Anomalies, *Review of Financial Studies* 19(3), 1001–1040.

Brennan, Michael J., Tarun Chordia, and Avanidhar Subrahmanyam, 1998, Alternative Factor Specifications, Security Characteristics, and the Cross-Secion of Expected Stock Returns, *Journal of Financial Economics* 49, 345–373.

Campbell, John Y., Jens Hilscher, and Jan Szilagyi, 2005, In Search of Distress Risk, Unpublished Paper, Harvard University.

Daniel, Kent, Mark Grinblatt, Sheridan Titman, and Russ Wermers, 1997, Measuring Mutual Fund Performance with Characteristic-Based Benchmarks, *Journal of Finance* 52(3), 1035–1058.

Dichev, Ilia D., 1998, Is the Risk of Bankruptcy a Systematic Risk?, *Journal of Finance* 53(3), 1131–1147.

Dichev, Ilia D., and Joseph D. Piotroski, 2001, The Long-Run Stock Returns Following Bond Rating Changes, *Journal of Finance* 56(1), 55–84.

Fama, Eugene F., and Kenneth R. French, 1992, The Cross-Section of Expected Stock Returns, *Journal of Finance* 47(2), 427–465.

Fama, Eugene F., and Kenneth R. French, 1993, Common Risk Factors in the Returns on Stocks and Bonds, *Journal of Financial Economics* 33, 3–56.

Fama, Eugene F., and James D. MacBeth, 1973, Risk, Return, and Equilibrium: Empirical Tests, *Journal of Political Economy* 81, 607–636.

Hand, John R.M., Robert W. Holthausen, and Richard W. Leftwich, 1992, The Effect of Bond Rating Agency Announcements on Bond and Stock Prices, *Journal of Finance* 47(2), 733–752.

Hasbrouck, Joel, 2005, Trading Costs and Returns for US Equities: The Evidence from Daily Data, Unpublished Paper, Leonard N. Stern School of Business, New York University.

Lintner, John, 1965, The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets, *Review of Economics and Statistics* 47, 13–37.

Newey, Whitney K., and Kenneth D. West, 1987, A Simple, Positive Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix, *Econometrica* 55(3), 703–708.

Sharpe, William F., 1964, Capital Asset Prices: A Theory of Market Equilibrium, *Journal of Finance* 19, 425–442.

Titman, Sheridan, 1984, The Effects of Capital Structure on a Firm's Liquidation Decision, *Journal of Financial Economics* 13(1), 137–151.

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: DGTW-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 mean 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. Earning surprise is calculated as the actual minus forecasted EPS divided by the absolute value of the actual EPS. 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.

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	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
Size (\$billions)	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
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
Turnover - NYSE/Amex (%)	4.45	4.88	5.21	5.43	5.78	6.11	6.32	6.29	5.76	5.49
Turnover - Nasdaq (%)	4.59	6.91	6.18	5.18	6.89	9.77	10.01	10.35	10.68	10.59
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
Earning Surprises	-0.01	-0.01	-0.01	-0.02	-0.03	-0.04	-0.07	-0.12	-0.19	-0.22
SUE	0.06	0.12	0.04	0.01	0.02	0.02	0.01	-0.00	-0.02	-0.04

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
1	-0.07 (**-2.01**)					
2		-0.02 (-0.46)	0.10 (1.51)	1.40 (**3.75**)	0.04 (0.47)	0.04 (0.58)
3	-0.07 (**-2.22**)	0.01 (0.34)	0.16 (**2.07**)	1.17 (**2.87**)	0.01 (0.19)	0.05 (0.77)

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
1	-0.09 (**-2.82**)					
2		-0.02 (-0.39)	0.12 (1.89)	1.42 (**4.33**)	-0.05 (-0.88)	-0.03 (-0.55)
3	-0.09 (**-3.55**)	-0.02 (-0.65)	0.15 (**2.14**)	1.22 (**3.35**)	-0.06 (-1.15)	-0.01 (-0.13)

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
1	-0.08 (**-4.63**)					
2		-0.01 (-0.53)	0.01 (0.22)	1.31 (**4.48**)	0.01 (0.18)	-0.01 (-0.14)
3	-0.09 (**-4.84**)	-0.02 (-0.60)	0.05 (0.96)	1.09 (**3.28**)	-0.01 (-0.13)	0.01 (0.15)

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, $t+1$. 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.

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

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
1	-0.01					
	(-0.32)					
2		-0.06	0.18	0.89	0.01	0.03
		(-1.35)	(**3.07**)	(**2.86**)	(0.24)	(0.65)
3	-0.03	-0.03	0.23	0.33	-0.01	0.04
	(-1.27)	(-0.96)	(**3.47**)	(0.97)	(-0.22)	(0.75)

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
1	-0.01					
	(-0.48)					
2		-0.05	0.07	0.82	0.07	0.06
		(**-2.08**)	(1.79)	(**2.97**)	(1.73)	(1.33)
3	-0.03	-0.02	0.14	0.28	0.04	0.06
	(-1.75)	(-0.68)	(**2.67**)	(0.89)	(1.01)	(1.20)

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.

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

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	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
-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
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
-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
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
-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
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
-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
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
-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.

Panel A: Analyst EPS Forecast Revisions (×100)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	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
-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) ($\times 100$)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	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
-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 ($\times 100$)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	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
-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.

Panel A: Illiquidity (NYSE/AMEX)

	Rating Decile (C1=Lowest , C10=Highest Risk)									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	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
-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
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
-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
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
-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

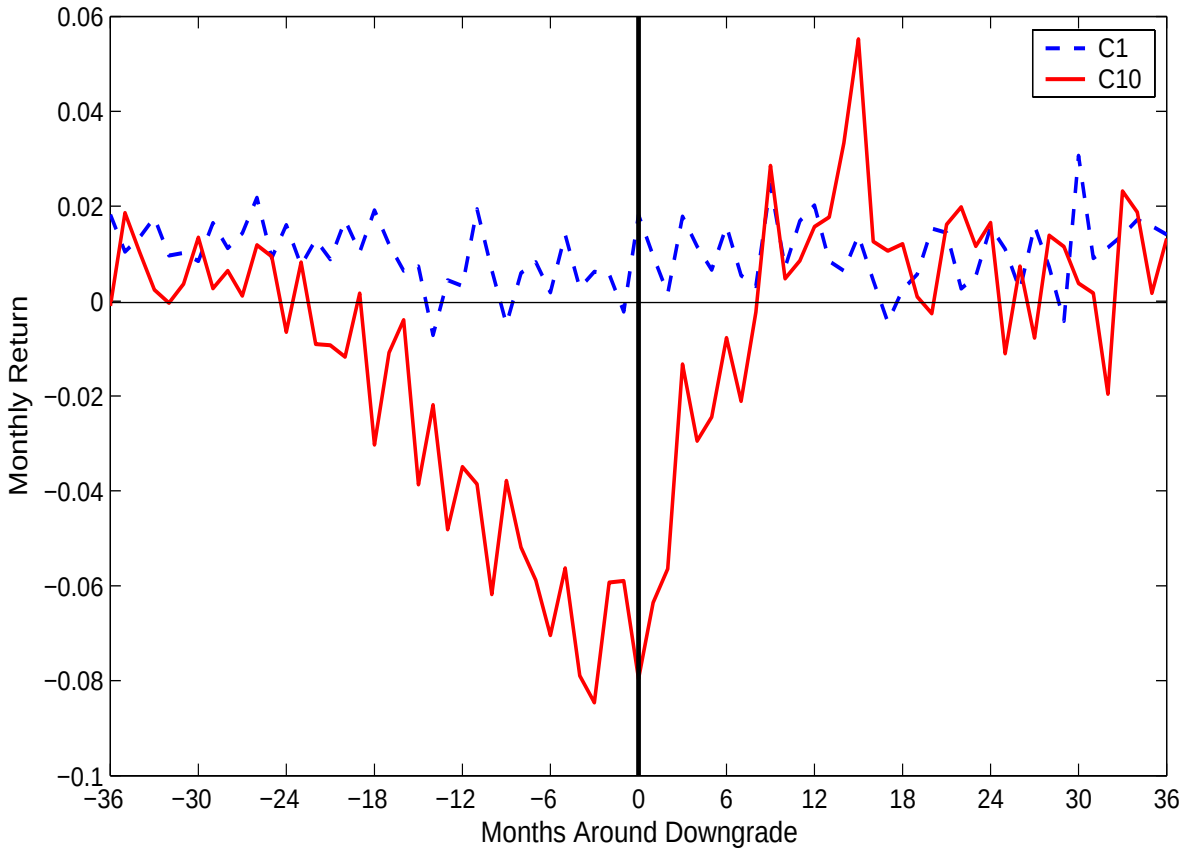

Figure 1. Returns around Downgrades. The figure presents monthly returns of the best (C1) and worst (C10) decile portfolio, formed on the basis of firm S&P credit rating, around periods of rating downgrades. Month 0 is the month of downgrade.