WEALTH EFFECTS OF RATING CHANGES IN EUROPE

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Abstract. We consider Moody's rating changes received by issuers listed in 17 European countries over the period January 2002 – December 2007. Consistently with the existing literature on US markets, the stock price reaction to rating actions is asymmetric: downgrades negatively affect equity value, while upgrades do not exert a significant impact. We further document that downgrades have a larger impact on non-UK issuers as well as non-financial companies. These findings suggest that information asymmetries are less severe in the UK market as well as in the financial sector –probably due to stricter disclosure rules and more extensive analysts' coverage. Finally, we examine the importance of the magnitude of rating changes: multiple notch downgrades result in a larger stock price decrease compared to one notch negative actions.

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I. Introduction

Credit Rating Agencies play an important role in modern financial markets since they are institutions that can have access to private information about the security issuers thanks to their screening activity [Abad-Romero and Robles-Fernandez (2006)]. This privileged situation enables Rating Agencies to gain an information advantage with respect to the rest of the investment community [Griffin and Sanvincente (1982)].
Assuming that agencies use all available information to review credit ratings in a timely fashion [Nicholls (2005)], the Information Asymmetry and Signalling Hypothesis (IASH) predicts that credit rating changes are private information-based signals concerning issuers' prospects. As a consequence, downgrades should be bad news producing a price reduction, while upgrades should be good news resulting in a price increase. As recently shown by Jorion and Zhang (2006), IASH predictions are consistent with Merton's model results [Merton (1974)] which implies a negative relationship between stock prices and default probabilities.

Although theory seems to converge on homogeneous findings, existing empirical evidence is puzzled and partly contradicts theory. Indeed, the key finding arising from past literature is that short-term rating change effects on stock prices are asymmetric: downgrades produce a significant equity underperformance while no reliable effect is associated with rating upgrades. Such asymmetry between downgrades and upgrades recurs in all existing US market studies [see for instance Goh and Ederington (1993) as well as Hand et al. (1992)]. In addition, US market literature shows that the downgrade underperformance is unanticipated by the market and fairly concentrated in the announcement day.

Most financial research is centred on the US stock market while, in comparison, much less attention has been dedicated to European markets for which empirical literature is almost inexistent and mostly based on country-specific data. To the best of our knowledge, no paper looked at the whole European market so far. Our paper aims filling this gap, using a Pan-European sample of more than 500 credit rating changes released by Moody's in the period January 2002–December 2007 and collected from the Internet database Ratings Interactive offered by Moody's Investors Service (*www.moodys.com/cust/default.asp*). Based on this innovative database, in this paper, we want to investigate the short-term impact of credit rating downgrades and upgrades on the European stock markets in order to explore whether results on the European stock market confirms the key finding that only negative rating actions are price-significant. In addition, a

further objective is to analyze the sensitivity of full sample results with respect to: 1) the issuer's country; 2) the issuer's sector; 3) the rating change magnitude.

We think that our paper can contribute to the existing literature from different perspectives, other than focusing on a unique set of Pan-european data. First, no previous paper has analyzed the impact of rating changes based on the number of notches by which the issuer is either downgraded or upgraded. Second, using a Pan-european set of data we can probe deeper into potential asymmetries between the impact of UK and non-UK rating changes. Third, we are able to analyze whether the markets behaves differently when rating changes referred to the financial sector – including banks and insurance companies – are considered and compared with rating changes of European non financial firms.

The rest of the paper is organized as follows. Section II reviews the relevant literature already available. Section III presents the description of the dataset and the criteria used to select the final sample of 405 rating changes. Section IV presents the results of our statistical analysis. Section V summarizes the main findings of our empirical analysis.

II. Literature review

The bulk of existing literature agrees on the result that short-term rating change effects on stock prices are asymmetric: downgrades produce a significant equity underperformance, while no significant impact (either positive or negative) is associated with upgrades.

For the US market, Hand et al. (1992) find that the underperformance arising from downgrades amounts to 152 basis points, concentrates in the announcement day and is economically larger for non-investment grade issuers. No abnormal performance is found for upgrades. The authors also remove rating actions occurring at the same time as other news concerning the issuer (i.e. mergers and acquisitions), finding that the asymmetry in rating change effects persists in uncontaminated samples. Goh and Ederington (1993) exhibit similar results, documenting a downgrade underperformance both in the announcement day (around 70 b.p.) and in the two weeks following the announcement (around 110 b.p.). The authors also split the full sample of downgrades according to whether the rating change is motivated by a deterioration in the issuer's financial prospects or a reduction in the issuer's leverage, finding that only the first group of actions is price-significant. The key evidence that only downgrades have a reliable information content (with negative implications) is also supported by

less recent US market studies [see Griffin and Sanvincente (1982) and Holthausen and Leftwich (1986)]. Interestingly, these works exhibit puzzling results concerning the time distribution of downgrade effects. Griffin and Sanvincente (1982) find that the equity underperformance for credit downgrades steadily emerges in the four weeks following the announcement. On the other hand, Holthausen and Leftwich (1986) report a 266 b.p. downgrade underperformance, which entirely concentrates in the announcement day and in the post-announcement day.[1] The asymmetry between downgrade and upgrade price effects is mirrored also in the Australian market as shown by Matolcsy and Lianto (1995).

When looking at the European market, literature hasn't come to definitive results. Barron et al. (1997) confirm the findings of the US market for the case of UK but contrasting results emerge from research concerning small-medium European markets. In Italy, Linciano (2004) finds an underperformance for downgrades in the announcement day and an outperformance for upgrades in the four days following the announcement. In Spain, Abad-Romero and Robles-Fernandez (2006) surprisingly find that only rating upgrades are price-significant (with negative implications). Gropp and Richards (2001) show that, for European banks, the underperformance arising from downgrades is economically thin and statistically insignificant.

An additional result from existing literature shows that the asymmetry between downgrade and upgrade effects persists in the long term[2] (see for instance Dichev and Piotrosky (2001) as well as Vassalou and Xing (2005), for the US stock market, and Chan et al. (2006), for the Australian market). Importantly, Vassalou and Xing document that, in the long term, the asymmetry in rating change effects can be traced back to the issuer's size and default risk. In particular, the authors highlight that upgrades are price-insignificant because they mainly involve large, low-default risk firms disclosing rich information to the investment community, while downgrades are price-significant because they tend to concern small, high-default risk firms releasing poor information to the marketplace.

III. Dataset description

[1] Other interesting findings for the US market refer to the rating changes for banks and financial institutions. Schweitzer et al. (1992) find that US banks' downgrades result in a significant reduction in stock prices.

[2] The distinction between short-term and long-term studies depends on the length of the event window. In short term studies, the event window typically covers from 31 to 61 trading days around the announcement day, while in long-term studies usually exceeds 250 trading days.

Our analysis is centered on the rating changes released by Moody's towards European listed companies over the period January 2002 - December 2007.
We consider Moody's issuer credit rating actions that are either positive (upgrades) or negative (downgrades), leaving out neutral actions. Data are gathered from Moody's Italia paper archives. In order to check the key characteristics of each rating action, we also use the Internet database Ratings Interactive offered by Moody's Investors Service. We focus on rating changes received by companies listed in the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. Our data constitute the full population of all the 575 Moody's rating changes for companies listed in these countries between January 2002 and December 2007. For this reason, our study is not affected by sample selection. Out of the 575 changes, 238 are upgrades and 337 downgrades. The preponderance of downgrades reflects the decline in the average creditworthiness of Moody's rated European issuers during the six years period 2002-2007. We have 310 issuers involved, so that on average there are 1.85 rating actions per issuer. Table 1 provides further details concerning the characteristics of rating changes.

*** * * Insert Table 1 about here * * ***

About one fourth of the actions relate to companies in UK (146 changes), followed by Germany (100), France (75) and Italy (43). The high incidence of UK rating actions follows from the fact that the UK is the European country with the highest number of Moody's rated issuers. From Panel A it emerges that about one third of the negative actions are concentrated in the UK (111/337 downgrades) while UK positive actions represent less than 15% of the total (35/238 upgrades), indicating that the creditworthiness of companies declined more in the UK with respect to other countries. Moreover, Panel B shows that 148 changes -corresponding to 25% of the full sample- are received by firms belonging to the financial sector, which includes banks and insurance companies. It is worthwhile to observe the high percentage of downgrades for non-financial issuers (84.87%), reflecting the deteriorated creditworthiness of European non-financial companies relative to financial issuers. More than 70% of the sample

comprises single notch actions (see Table 1-Panel C).[3] However, it is not unusual to observe multiple notch rating actions for both upgrades and downgrades. The number of actions per issuer in our sample is reported in Panel D. Roughly half of the issuers receive one rating change only (161/310 issuers). Considering positive and negative actions separately, Panel D illustrates that companies are more likely to receive downgrades (74/205 issuers) than upgrades (47/174 issuers). This evidence is again consistent with the reduction in European issuers' credit quality over the period 2002-2007. Finally, Panel E shows the time distribution of actions during the years. Downgrades are heavily concentrated in the period 2002 -2003 (around 56% of downgrades occur over there two years). On the contrary, upgrades are infrequent in 2002 and 2003, while they remarkably grow subsequently (in particular, in 2007). These statistics reflect the fact that European issuers' creditworthiness worsened in the period 2002 - 2003, and levelled off in the following years. Also notice that the overall number of rating changes stays fairly stable over the sampling period, even if we can observe a negative peak in 2004 (67 actions) and a positive peak in 2007 (133 actions).

We have filtered our initial population according to the following criteria. During the first semester of 2007 Moody's operated a change in the evaluation of the financial soundness of financial companies. Since these actions are motivated by purely technical considerations, and impound no new information on the quality of financial firms' debt, we drop 54 upgrades for financial firms.[4]
Second, following Pinches and Singleton (1978), we exclude changes that are contaminated by another corporate event such as mergers, bond or equity issuances. From the SDC database we identify the companies that completed such transactions during the 10 days prior to the rating change announcement, and consequently dropped 78 actions. Finally, we require daily price data availability during the estimation and the event window, thus reducing the sample to 405 rating changes. From now onwards this constitutes our uncontaminated sample. Compared to the full sample we see that the incidence of upgrades is now lower: 35.31% of all actions, down from 41.39% in the full sample. Country breakdown (see Table 1-Panel A) is preserved, with the only

[3] A single notch rating change occurs when a given issuer is either downgraded or upgraded by one notch. On the contrary, a multiple notch rating change occurs when a given issuer is either downgraded or upgraded by two or more notches.

[4] In particular, these upgrades derived from the incorporation of joint-default analysis (JDA) into Moody's Bank Rating Methodology, which identifies four potential sources of external support for banks, i.e. parental support, support from a cooperative or mutualist group, support from a regional or local government and systemic support.

exception of Sweden that replaces Italy as the fourth most represented country. This is due to the fact that the vast majority of Italian rated issuers are banks, and thus subject to Moody's change in the rating methodology previously described. The impact of this filter emerges from Panel B as well: positive actions received by financial issuers now account for roughly 8% of all the changes, compared to 16.89% in the full sample. From Panel C it emerges that single notch actions are relatively more frequent in the uncontaminated sample (313/405) than in the original one (421/575). The uncontaminated sample includes 242 issuers, thus bringing the average number of actions per issuers down to 1.67. As Panel D reveals, issuers are more likely (61.16%) to receive one rating action as compared to the full sample (51.94%). Finally, compared to the full population, the uncontaminated sample exhibits a sharp reduction of downgrades in 2002 (from 30.56% down to 25.95%, see Panel E). This reflects the fact that in this year 35 out of the original 103 downgrades (i.e. 34%) are either associated with price-sensitive corporate events (such as mergers, bond issuances and equity issuances) or affected by data unavailability. The uncontaminated sample also shows a dramatic decrease of upgrades in 2007 (from 39,08% down to 22,38%), due to the fact that in this year 54 out of the original 93 upgrades are driven by the above mentioned change in Moody's evaluation techniques for the financial sector. Overall, in the uncontaminated sample the time distribution of rating changes turns out to be much more balanced compared to the full population.

IV. Analysis

We identify day 0 with the day of the rating change announcement, and consider the 21 days surrounding the event i.e. from day -10 to +10, as the event window. The event study employs daily abnormal (log-)returns defined as prediction errors calculated from a Carhart (1997) four-factor pricing model adjusted for infrequent trading. For each rating change *i* we use a 240-days window prior to day -10 to estimate the model:

$$r_{i,t} - r_{f,t} = \alpha_i + \sum_{j=-1}^{1} \beta_{i,j} \left(r_{M,t+j} - r_{f,t} \right) + \sum_{k=1}^{3} \gamma_{i,k} r_{k,t} + \varepsilon_{i,t} \qquad (1)$$

where $r_{i,t}$ and $r_{M,t}$ are, respectively, the stock *i* and market portfolio day *t* returns, $r_{f,t}$ is the one-month Euribor rate,[5] and $r_{k,t}$ is the day *t* return on the *k*-th factor replicating portfolio. The market portfolio is approximated by the S&P

[5] Our results are not affected if we considered the Euribor 3 month rate instead.

Europe 350 Index, which covers 17 major European markets. Since the use of daily returns may lead to serial correlation as well as biased estimates of systematic risk [see Scholes and Williams (1977)], we follow Dimson (1979) and add the lagged and leading market excess returns among the independent variables. Size, value and momentum constitute the other three factors included in model (1). The size (resp. value) factor is given by the return on a zero-cost portfolio long in the MSCI Europe[6] Small Cap (resp. Value) Index and short in the MSCI Europe Large (resp. Growth) Index. Finally, we follow Jegadeesh and Titman (1993) and use returns from strategies involving relative strength portfolios to produce the momentum factor. We consider a 3-month/3-month strategy that selects stocks included in the S&P Europe 350 Index as follows. Each day *t* the 350 securities are ranked in descending order based on returns over the past 60 days, and the strategy: 1) purchases the winners portfolio (equally weighted in the top decile stocks) and sells the losers portfolio, and 2) closes the position initiated 60 days before. Thus, each day the weights of 1/60 of the stocks are revised in the entire portfolio. The estimated parameters from model (1) are then used[7] to compute the daily abnormal returns between day -10 and +10 as well as the cumulative abnormal returns (CARs) over different windows surrounding the event: preannouncement (-10,-6) and (-5,-1); announcement (0,+1)[8]; post-announcement (+2,+5) and (+6,+10). Finally, individual CARs are averaged in the cross-section of rating changes to produce mean cumulative abnormal returns (MCARs).

We first investigate the impact of positive and negative actions in our sample. In Table 2 we report the cumulative abnormal returns for both upgrades (Panel A) and downgrades (Panel B). For the MCARs we report in parentheses the *t*-statistics based on the cross-sectional standard deviation of individual CARs. We complement the analysis with the median CAR and the percentage of individual CARs that are positive. Finally, to assess whether the observed proportion of

[6] The MSCI Europe indices cover 16 European markets, covering all countries in our study except Luxembourg.

[7] We follow Dimson (1979) and set the sensitivity to the market return equal to $\sum_{j=-1}^{1} \hat{\beta}_{i,j}$, where $\hat{\beta}_{i,j}$ is the parameter estimate of $\beta_{i,j}$ in eq. (1). Using the estimator proposed by Scholes and Williams (1977) would not alter our results.

[8] Consistently with previous studies, we consider abnormal returns summed over days 0 and +1 for the announcement window [see for instance Hand et al. (1992) and Goh and Ederington (1993)].

positive CARs is reliably different from 50% we perform the binomial sign test (*z*-statistic).

*** * * Insert Table 2 about here * * ***

Results in Table 2 show that downgrades significantly reduce stock returns at announcement by 1.22% on average. Moreover, roughly 58% of the firms in our sample exhibit negative abnormal returns during the announcement window. This evidence yields three key insights concerning the short-term impact of rating downgrades in the European stock market.
First, downgrades have an additional information content with negative implications. Second, downgrades prove to be unanticipated, as there is no reliable market reaction before the announcement. Third, investors are highly efficient in processing downgrade information, since the equity underperformance is entirely concentrated in the announcement window.

Table 2 also highlights that upgrades are not accompanied by abnormal returns, even if the sign test indicates that the percentage of firms with positive CAR at the announcement is significantly different from 50%.

Our full sample results are highly consistent with existing US market literature. These studies indeed document an asymmetry in rating change effects, since only negative actions have a reliable information content, which reduces stock prices and is not anticipated by the investment community [see for instance Goh and Ederington (1993), Griffin and Sanvincente (1982), Hand et al. (1992) and Holthausen and Leftwich (1986)]. In addition, most US market studies show that downgrade effects are fairly concentrated in the announcement window [see Hand et al. (1992) and Holthausen and Leftwich (1986)]. However, Goh and Ederington (1993) find that more than half of overall downgrade impact arises in the two weeks following the announcement, while Griffin and Sanvincente (1982) show that the downgrade underperformance steadily emerges in the four weeks following the announcement. Interestingly, comparing this evidence to our results, we can conclude that the US market is slightly less efficient than the European market in processing downgrade price-sensitive information. Focusing on the magnitude of the downgrade underperformance, the US market appears more severe than the European market. Indeed, in US market studies the equity underperformance associated with rating downgrades ranges from -120 b.p. down to –266 b.p. and is larger than the -122 b.p. underperformance reported in Table 2 for the European market.

Notice that existing European market literature provides contrasting results. The asymmetry in rating change effects indeed recurs in Barron et al. (1997) for the case of UK but is not supported by other European studies [see Linciano (2004) for the Italian market as well as Abad-Romero and Robles-Fernandez (2006) for the Spanish market]. However, these works focus on domestic markets and therefore use fairly small samples for inference. Relying on a larger and Pan-European set of rating actions, our study suggests that existing puzzling results for small-medium European markets may derive from a sample size bias.

We then split full samples into a number of additional groupings to examine the determinants of abnormal returns. The different subsamples are selected by characteristics of firm (country and sector), as well as the magnitude of the rating change (i.e. the number of notches determined by the change).

*** * * Insert Table 3 about here * * ***

As Table 3 illustrates, the previous finding that positive actions do not affect stock returns is robust across countries. Indeed, UK upgrades result in negative stock performance (MCAR of -0.77%) during the week after the announcement. This evidence is however due to some outliers, as the sign test indicate.

*** * * Insert Table 4 about here * * ***

The downgrades breakdown in Table 4 reveals that the negative impact of downgrades at announcement is mainly due to non-UK countries, where it reduces stock prices by more than 1.5% (*t*-statistics 3.68). Such decrease is experienced by roughly 60% of the firms. Table 4 shows some evidence that downgrades are anticipated in the UK during the week prior to the announcement. The percentage of firms with negative CARs over the window (-5,-1) is however not different from 50%, which suggests that the anticipation occurs in very few cases. Results in Table 4 suggest a geographical asymmetry in downgrade effects on European stocks' performances and imply that information asymmetry between Moody's and investors is thinner in the UK and thicker in other European countries.

Notice that our findings partly diverge from existing literature for the UK market. Actually, Barron et al. (1997) find that upgrades do not affect UK issuers' stock prices, while downgrades have a significant equity impact, which is entirely concentrated in the announcement date. Two technical reasons may explain such a divergency. First, our work estimates normal stock performances

using the Carhart four-factor pricing model, while Barron et al. (1997) rely on a simple Single Index Market Model. Second, our study makes use of event-windows observations to estimate the variance of stock performances (thus accounting for potential risk shifts associated with the announcement), while Barron et al. (1997) use estimation-window observations[9].

Sectioning the sample according to the industries confirms that upgrades do not impact on share prices, overall (see Table 5). Intriguingly, roughly 67% of the financial stocks experience a significantly *negative* price reaction two weeks after the announcement suggesting some underreaction at announcement.

*** * * Insert Table 5 about here * * ***

Table 6 shows that downgrades do reduce *both* financial and non-financial stocks performance with significantly negative returns of -1.30% and -1.20%, respectively.

*** * * Insert Table 6 about here * * ***

Existing literature shows that the equity underperformance for European financial stocks is economically thin and statistically insignificant [see Gropp and Richards (2001)] and concludes that financial downgrades have a poor information content because banks and other financial issuers have to comply with heavy disclosure obligations. Our results contrast with this framework, even if a deeper inspection of table 6 reveals that the reduction in financial stocks' performance is driven by few observations (notice that the sign test is insignificant for each window).

We finally investigate whether the rating change magnitude affects returns. Given the small sample size of multiple notches upgrades (23) we focus on downgrades only. From Table 7 we see that a multiple notch downgrade has a negative effect during the announcement window which is twice as much the one notch downgrade. Noteworthy, stocks experiencing a multiple notch downgrade partially recoup their loss in value during the week after the announcement. To our knowledge, no previous study investigates the role of the downgrade magnitude so that we cannot verify weather our evidence can be extended to other markets, in particular to the US market.

[9] In Barron et al. (1997) the estimation of MCARs standard error is based on the residuals.from the SIMM.

*** * * Insert Table 7 about here * * ***

V. Conclusions

In this paper, we have compared the informational content of rating changes in Europe with the US experience. We consider Moody's rating changes received by issuers listed in 17 European countries over the period January 2002 – December 2007. We find that, consistently with the existing literature on US markets, the stock price reaction to rating actions is asymmetric: downgrades negatively affect equity value, while upgrades do not exert a significant impact. We further document that downgrades have a larger impact on non-UK issuers as well as non-financial companies. These findings suggest that information asymmetries are less severe in the UK market as well as in the financial sector –probably due to stricter disclosure rules and more extensive analysts' coverage. Finally, we examine the importance of the magnitude of rating changes: multiple notch downgrades result in a larger stock price decrease compared to one notch negative actions.

VI. Tables

	Number of Observations						
	Full sample				Uncontaminated sample		
	all	upgrades	downgrades		all	upgrades	downgrades
Panel A – Country							
UK	146	35	111	UK	113	27	86
Germany	100	39	61	Germany	70	24	49
France	75	36	39	France	52	21	28
Italy	43	20	23	Sweden	31	14	17
Other	211	108	103	Other	139	57	82
Total	575	238	337	Total	405	143	262
Panel B – Sector							
Financial	148	97	51	Financial	70	33	37
Non financial	427	141	286	Non financial	335	110	225
Total	575	238	337	Total	405	143	262
Panel C – Magnitude							
One notch	421	185	236	One notch	313	120	193
Two notch	123	46	77	Two notch	74	20	54
More than two	31	7	24	More than two	18	3	15
Total	575	238	337	Total	405	143	262
Panel D – Issuers							
One action	161	127	121	One action	148	88	110
Two actions	91	34	55	Two actions	59	17	44
More than two	58	13	29	More than two	35	6	18
Total	310	174	205	Total	242	111	172
Panel E – Year of change							
2002	111	8	103	2002	76	8	68
2003	96	18	78	2003	80	14	66
2004	67	38	29	2004	46	22	24
2005	78	48	30	2005	66	40	26
2006	90	33	57	2006	74	27	47
2007	133	93	40	2007	63	32	31
Total	575	238	337	Total	405	143	262

Table 1. Characteristics of rating changes.

Moody's credit rating actions received by issuers listed in 17 European countries over the period January 2002-December 2007 are gathered from Moody's Italia paper archives. The uncontaminated sample filters out: 1) rating changes due to the incorporation of joint-default analysis (JDA) into Moody's Bank Rating Methodology during the first semester of 2007; 2) actions contaminated by a another corporate event (merger, bond or equity issuance) and 3) daily price data availability over the estimation and event window.

	Panel A: upgrades [143]			Panel B: downgrades [262]		
	mean (%)	median (%)	% positive	mean (%)	median (%)	% positive
(-10,-6)	-0.18	-0.30	44.06	0.38	0.34	56.87
	(-0.65)		(-1.42)	(1.27)		(2.22**)
(-5,-1)	-0.21	0.10	51.05	-0.66	-0.02	49.62
	(-0.60)		(0.25)	(-1.92*)		(-0.12)
(0,+1)	0.19	0.14	54.55	-1.22	-0.26	42.37
	(1.11)		(1.09)	(-3.78***)		(-2.47**)
(+2,+5)	-0.06	-0.06	48.95	-0.02	-0.19	46.95
	(-0.29)		(-0.25)	(-0.08)		(-0.99)
(+6,+10)	-0.28	-0.12	47.55	-0.02	0.02	50.57
	(-1.04)		(-0.59)	(-0.06)		(0.19)

Table 2. Price response to upgrades and downgrades.

Cumulative abnormal return surrounding upgrades (Panel A) and downgrades (Panel B). Sample size for each panel is indicated in square brackets. Mean CARs, median CARs and the percentage of positive CARs are shown for different windows. For mean CARs (resp. the percentage of positive CARs) the *t*-statistics (resp. *z*-statistic) are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level respectively.

	Panel A: upgrades UK [27]			Panel B: upgrades non UK [116]		
	mean (%)	median (%)	% positive	mean (%)	median (%)	% positive
(-10,-6)	-0.27	-0.14	44.44	-0.16	-0.35	43.97
	(-0.41)		(-0.58)	(-0.52)		(-1.30)
(-5,-1)	-0.36	0.49	59.26	-0.17	-0.08	49.14
	(-0.27)		(0.96)	(-0.58)		(-0.19)
(0,+1)	-0.31	-0.17	40.74	0.30	0.21	57.76
	(-0.88)		(-0.96)	(1.61)		(1.67*)
(+2,+5)	-0.77	-0.42	40.74	0.11	0.01	50.86
	(-1.87*)		(-0.96)	(0.47)		(0.19)
(+6,+10)	-0.92	-1.06	37.04	-0.13	0.00	50.00
	(-1.11)		(-1.37)	(-0.48)		(0.00)

Table 3. Price response to upgrades for different countries.

Cumulative abnormal return surrounding upgrades in the UK (Panel A) and non-UK countries Panel B). Sample size for each panel is indicated in square brackets. Mean CARs, median CARs and the percentage of positive CARs are shown for different windows. For mean CARs (resp. the percentage of positive CARs) the *t*-statistics (resp. *z*-statistic) are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level respectively.

	Panel A: downgrades UK [86]			Panel B: downgrades non UK [176]		
	Mean (%)	median (%)	% positive	mean (%)	median (%)	% positive
(-10,-6)	0.82	0.58	62.79	0.16	0.20	53.98
	(1.59)		(2.37**)	(0.44)		(1.05)
(-5,-1)	-1.22	-0.28	48.84	-0.38	0.01	50.00
	(-1.92*)		(-0.22)	(-0.94)		(0.00)
(0,+1)	-0.51	-0.07	47.67	-1.56	-0.38	39.77
	(-1.13)		(-0.43)	(-3.68***)		(-2.71***)
(+2,+5)	-0.34	-0.49	40.70	0.14	0.01	50.00
	(-0.93)		(-1.72*)	(0.41)		(0.00)
(+6,+10)	0.29	0.68	59.30	-0.17	-0.18	46.29
	(0.66)		(1.72*)	(-0.46)		(-0.98)

Table 4. Price response to downgrades for different countries.

Cumulative abnormal return surrounding downgrades in the UK (Panel A) and non-UK countries (Panel B). Sample size for each panel is indicated in square brackets. Mean CARs, median CARs and the percentage of positive CARs are shown for different windows. For mean CARs (resp. the percentage of positive CARs) the *t*-statistics (resp. *z*-statistic) are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level respectively.

	Panel A: upgrades financials [33]			Panel B: upgrades non-financials [110]		
	mean (%)	Median (%)	% positive	mean (%)	Median (%)	% positive
(-10,-6)	0.30	-0.08	45.45	-0.33	-0.35	43.64
	(0.52)		(-0.52)	(-1.03)		(-1.33)
(-5,-1)	-0.21	0.19	51.52	-0.21	0.06	50.91
	(-0.44)		(0.17)	(-0.49)		(0.19)
(0,+1)	0.34	0.21	60.61	0.14	0.14	52.73
	(1.36)		(1.22)	(0.69)		(0.57)
(+2,+5)	-0.02	0.01	51.52	-0.07	-0.13	48.18
	(-0.09)		(0.17)	(-0.28)		(-0.38)
(+6,+10)	-0.70	-1.09	33.33	-0.15	0.03	51.82
	(-2.40**)		(-1.91*)	(-0.45)		(0.38)

Table 5. Price response to upgrades for different industries.

Cumulative abnormal return surrounding upgrades for financial (Panel A) and non-financial firms (Panel B). Sample size for each panel is indicated in square brackets. Mean CARs, median CARs and the percentage of positive CARs are shown for different windows. For mean CARs (resp. the percentage of positive CARs) the *t*-statistics (resp. *z*-statistic) are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level respectively.

	Panel A: downgrades financials [37]			Panel B: downgrades non-financials [225]		
	mean (%)	median (%)	% positive	Mean (%)	median (%)	% positive
(-10,-6)	1.09	0.44	59.46	0.26	0.31	56.44
	(1.29)		(1.15)	(0.82)		(-1.93*)
(-5,-1)	-1.22	-0.36	48.65	-0.56	-0.01	49.78
	(-1.43)		(-0.16)	(-1.51)		(-0.07)
(0,+1)	-1.30	-0.23	43.24	-1.20	-0.26	42.22
	(-1.87*)		(-0.82)	(-3.36***)		(-2.33**)
(+2,+5)	0.19	-0.61	45.95	-0.05	-0.09	47.11
	(0.27)		(-0.49)	(-0.20)		(-0.87)
(+6,+10)	-0.44	-0.40	47.22	0.05	0.13	51.11
	(-0.56)		(-0.33)	(0.16)		(0.33)

Table 6. Price response to downgrades for different sectors.

Cumulative abnormal return surrounding downgrades for financial (Panel A) and non-financial firms (Panel B). Sample size for each panel is indicated in square brackets. Mean CARs, median CARs and the percentage of positive CARs are shown for different windows. For mean CARs (resp. the percentage of positive CARs) the *t*-statistics (resp. *z*-statistic) are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level respectively.

	Panel A: downgrades one notch [193]			Panel B: downgrades multiple notch [69]		
	mean (%)	median (%)	% positive	mean (%)	median (%)	% positive
(-10,-6)	0.67	0.36	57.51	-0.44	0.16	55.07
	(2.01**)		(2.09**)	(-0.69)		(0.84)
(-5,-1)	-0.40	0.14	51.30	-1.38	-0.44	44.93
	(-1.04)		(0.36)	(-1.88*)		(-0.84)
(0,+1)	-0.97	-0.26	41.97	-1.92	-0.26	43.48
	(-3.03***)		(-2.23**)	(-2.29**)		(-1.08)
(+2,+5)	-0.41	-0.35	43.52	1.06	0.28	56.52
	(-1.46)		(-1.80*)	(1.95*)		(1.08)
(+6,+10)	0.07	0.15	52.33	-0.08	-0.38	46.38
	(0.21)		(0.65)	(-0.13)		(-0.60)

Table 7. Price response to downgrades for different magnitude.

Cumulative abnormal return surrounding downgrades for one notch (Panel A) and multiple notches actions (Panel B). Sample size for each panel is indicated in square brackets. Mean CARs, median CARs and the percentage of positive CARs are shown for different windows. For mean CARs (resp. the percentage of positive CARs) the *t*-statistics (resp. *z*-statistic) are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level respectively.

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