

## The price impact of rating announcements: evidence from the credit default swap market<sup>1</sup>

*Rating announcements affect spreads on credit default swaps. The impact is more pronounced for negative reviews and downgrades than for outlook changes.*

*JEL classification: G10, G14.*

Credit rating agencies are widely perceived to exert a significant influence on credit markets. Indeed, agencies' rating decisions are sometimes blamed for increasing borrowing costs for affected issuers. For example, in February 2003 spreads on bonds issued by German steel and engineering firm ThyssenKrupp widened by as much as 60 basis points in the days following an announcement by Standard & Poor's that it might downgrade the firm.<sup>2</sup> Careful analysis of the impact of rating announcements on credit default swap prices for a broad range of issuers confirms that credit ratings do convey information to market participants. Even announcements that are anticipated by earlier movements in spreads seem to contain additional pricing-relevant information.

### The rating process

Rating events include changes in credit ratings ...

Credit ratings provide a summary measure, albeit subjective, of issuers' relative creditworthiness. They are not precise measures of default risk but instead facilitate comparisons across issuers by means of standardised risk categories. While each rating agency defines its own categories, the correspondence between the different agencies' categories is well understood by market participants. The two largest global rating agencies are Moody's and Standard & Poor's. Moody's assigns ratings from Aaa for the least risky debt to Baa3 for the most risky investment grade debt; these correspond to ratings from AAA to BBB- by Standard & Poor's.

---

<sup>1</sup> The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS.

<sup>2</sup> Standard & Poor's expressed concerns about ThyssenKrupp's unfunded pension liabilities. The firm was downgraded two weeks after the announcement, from BBB to BB+.

In addition to ratings, agencies also announce *outlooks*, *reviews* and *credit watches*. Outlooks reflect rating agencies' prognosis – positive, negative or stable – regarding the likely direction of an issuer's credit quality over the medium term, usually over a 12- to 18-month horizon. They are typically modified when a change in an issuer's risk profile has been observed but it is not yet regarded as permanent enough to warrant a new credit rating. Moreover, a change in outlook does not always lead to a change in rating. Reviews and credit watches are synonymous; both give a stronger indication than outlooks of future changes in ratings (from here on, we will refer to both reviews and credit watches as just "reviews").<sup>3</sup> The rating of issuers placed on review for an upgrade or downgrade is typically changed within weeks of the review. However, issuers need not be on review to be upgraded or downgraded. Agencies at times change ratings without any prior announcement of a change in outlook or a review.

... outlooks ...

... and reviews

Agencies have privileged access to information about borrowers and devote considerable resources to analysing that information. Outlooks, reviews and ratings are based on both public information about borrowers' operating and financial conditions and private information obtained through confidential discussions with borrowers.<sup>4</sup> In addition, rating decisions incorporate agencies' qualitative judgments regarding the plans and effectiveness of borrowers' management. Some market participants, in particular banks and large institutional investors, enjoy similar informational advantages. However, many other investors rely on credit ratings when assessing the credit quality of borrowers and debt issues.

Rating agencies have privileged access to information

## Evidence from corporate bond and equity markets

If investors perceive that rating agencies enjoy an informational advantage, then rating events should have an immediate impact on credit spreads: spreads should adjust instantly to incorporate the new information conveyed by new outlooks, reviews or ratings. Past studies of the informational value of credit ratings are inconclusive. Some find that rating events, in particular rating downgrades, have a significant effect on prices, but others find no impact.

Looking at the US corporate bond market, Katz (1974) finds that bond prices adjust to rating changes, albeit with a slight delay. Moreover, there is no movement in prices prior to the announcement of a rating change, suggesting that investors do not anticipate the change. In contrast, Hettenhouse and Sartoris (1976) and Weinstein (1977) conclude that bond prices react to other information released prior to the rating change. Steiner and Heinke (2001) examine the international bond market and find that there are significant price

Past studies of corporate bond and equity markets ...

---

<sup>3</sup> Moody's places companies on review for an upgrade or downgrade, while Standard & Poor's puts firms on credit watch.

<sup>4</sup> In the United States, rating agencies are exempt from the Securities and Exchange Commission's fair disclosure regulation. Introduced in 2000, Regulation FD prohibits firms from making selective non-public disclosures to market participants but allows them to share non-public information with rating agencies.

movements up to 100 trading days prior to the rating change. Nevertheless, bond prices still react to the actual announcement of downgrades and negative outlooks, although not to upgrades and positive outlooks.

A number of other studies focus on equity markets, which might be expected to reflect information more quickly because of their greater liquidity. However, the results seem not to differ from those obtained for corporate bond markets. Pinches and Singleton (1978) find that the information content of bond rating changes is negligible. And although Griffin and Sanvicente (1982) find that excess stock returns following downgrades are significantly negative, excess returns following upgrades are found to be statistically insignificant.

... have not reached consensus on whether ratings convey additional information

Still other studies introduce various controls to better isolate the price impact of rating events. Again the results are mixed. Kliger and Sarig (2000) examine the reaction of both bond and equity prices to Moody's refinement of its rating system in 1982. They find that even though the new alphanumeric ratings were based on exactly the same information that underlay the previous alphabetical ratings, the announcement of the new ratings had an effect on bond and equity prices. Hand et al (1992) control for previous rating and outlook changes, dividing announcements into those preceded by other rating events and those not preceded by such events. They find that in both cases downgrades are fully anticipated by market participants and therefore have no contemporaneous impact on equity prices.

This study focuses on credit default swaps ...

In the remainder of this special feature, we extend the literature on the informational value of credit ratings in two ways. First, we focus on credit default swaps, which for many names are more liquid than corporate bonds. Second, we control for various preceding rating events, including outlook changes and reviews from different rating agencies. Hull et al (2003) seem to have been the first to analyse the impact of rating events on credit default swap prices. They find that spreads for these swaps tend to anticipate negative rating announcements. However, they do not control for earlier rating events.

## The credit default swap market

Efforts to measure the informational significance of rating events have been hampered by the fact that credit markets have historically been among the least liquid of financial markets. Corporate bond issues are often small in size; many have options or other unique features that make them complicated to price; they are difficult to borrow, and so to sell short in expectation of a widening of spreads; and there tends to be very little trading once they have been placed in institutional investors' portfolios. This lack of liquidity makes it difficult to identify whether price changes are driven by rating (or other information) events or idiosyncratic factors.

... because they are more liquid

With the development of credit default swap markets, a new credit instrument was created which has the potential to offer an advantage in terms of liquidity – and which is increasingly seen as doing so. A credit default swap (CDS) is in essence an insurance contract protecting against losses arising from a default. In a CDS contract, the buyer of credit protection pays to the seller of protection a periodic fee analogous to the spread between the yield on

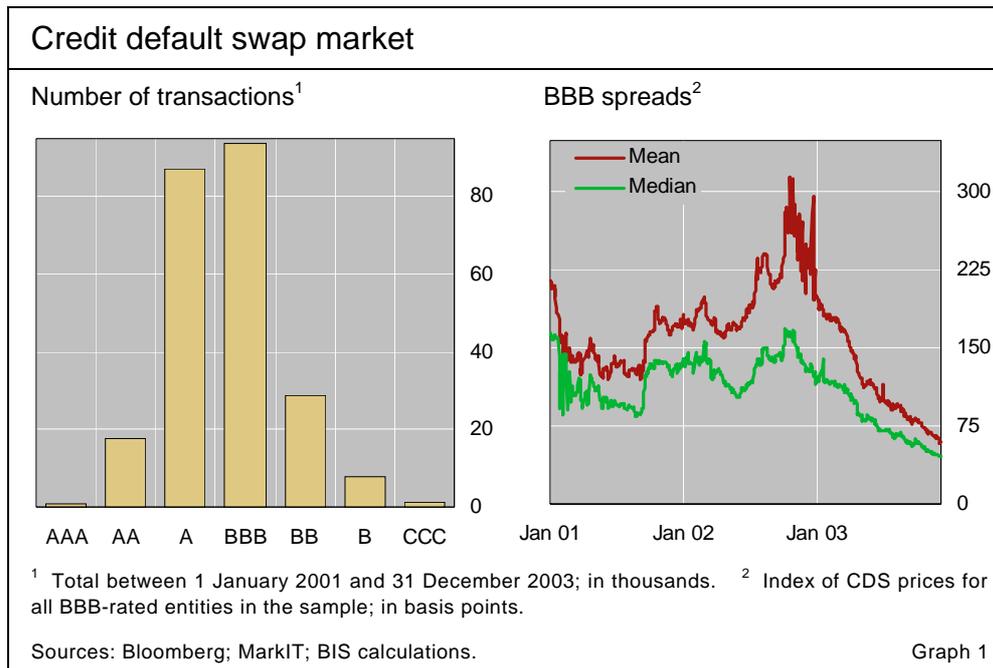
a defaultable security and the risk-free interest rate. In the event that the reference entity defaults, the buyer typically delivers to the seller debt owed by the reference entity in return for a lump sum equal to the face value of the debt. Liquidity in the CDS market is promoted through the use of standardised contractual terms,<sup>5</sup> and also through the ease with which short positions can be taken, by buying credit protection.

Using data from MarkIT, a London-based provider of credit derivatives data, we compiled a sample of daily CDS prices for 694 reference entities over a three-year period, from 1 January 2001 to 31 December 2003. The prices are those of actual transactions.<sup>6</sup> The sample includes financial institutions and non-financial corporations based in the euro area, Japan, Sweden, Switzerland, the United Kingdom and the United States. Entities rated above AA or below BB are excluded because they tend to be less liquid; trading in the CDS market is concentrated in entities rated A and BBB (Graph 1).<sup>7</sup> Moreover, only contracts with a maturity of five years are included because they are the most liquid.

In testing for the price impact of rating events, it is important to control for possible market-wide systematic factors that could move all prices simultaneously. For example, a widening of spreads could reflect the release of worse than expected macroeconomic news rather than a rating event that

Liquidity is concentrated in entities rated A and BBB

It is important to control for systematic factors ...



<sup>5</sup> Several different types of CDS contracts are traded, with the main difference between them being the definition of a default or credit event. In particular, some contracts treat debt restructurings differently from others. See BIS (2003, pp 112–13).

<sup>6</sup> The daily price for a given reference entity is calculated as the average across all transactions on the same day.

<sup>7</sup> In the case of entities with split ratings, ie different ratings from different agencies, the lower rating is taken. For simplicity, Standard & Poor's alphabetical rating categories are used throughout the text of this feature.

occurred on the same day. This we attempt to control for by subtracting an index of spreads for a given credit rating from each CDS spread with the same rating. In other words, spreads are adjusted for price movements common across spreads in a given rating category.

The construction of the index can have a significant impact on the eventual results. The index should ideally include the spreads of all similarly rated reference entities. Such broad market indices have long been available for corporate bonds. However, because fluctuations in the liquidity premium are likely to be greater for corporate bonds than for CDSs, corporate bond indices are unlikely to be good proxies for CDS spreads. Broad indices for the CDS market have recently been launched, most notably TRAC-X and iBoxx, but only towards the end of our sample period. Consequently, we follow the example of Hull et al (2003) and construct an index based on prices in our sample.

Whereas Hull et al (2003) calculate a mean spread, an index based on the median spread arguably better represents the sample. The distribution of credit spreads for any given rating tends to be highly positively skewed. As shown in Graph 1, the mean of the distribution can be heavily influenced by one or two extreme observations. Therefore, the median provides a more accurate measure of central tendency.

## Rating events

... and for preceding rating events

In addition to controlling for market-wide factors, it is important to take account of two further factors when assessing the informational value of credit ratings. First, rating changes are often but not always preceded by other rating announcements that may anticipate the new rating. This is especially true of reviews, which as mentioned earlier typically result in a rating change within a few weeks. Second, rating agencies often do not act at the same time: a rating change by one agency may already have been anticipated by another agency's rating.

To control for these factors, we distinguish between rating events that are preceded by other rating events up to 60 business days earlier and events that are not preceded by other events. For example, we distinguish between rating changes preceded by reviews and rating changes not preceded by any other announcement. Rating announcements by both Moody's and Standard & Poor's are considered. Only events for which CDS spreads are available in the 60-day period prior to the event are included in the sample.

Sixty days was selected as the period for identifying preceding events because it seems unlikely that rating agencies would take longer to act on material information. Indeed, over the 2001–03 sample, the average period between a review and a downgrade was 49 business days. The event window is further subdivided into four time intervals: 60 to 21 days before the new outlook, review or rating; 20 to two days before the event, one day before and after the event, and two to 20 days after the event. If rating events are fully anticipated, then spreads should adjust prior to the event, in either the first or the second time interval. If rating announcements contain pricing-relevant information, then events should have a discernible effect on CDS spreads

Distribution of negative rating events				
Number of rating events during the 2001–03 sample period				
	Type of rating event			All events
	Negative outlook	Negative review	Downgrade	
All events	386	754	870	2,010
Moody's	176	424	421	1,021
Standard & Poor's	210	330	449	989
Without preceding events <sup>1</sup>	237	521	374	1,132
With preceding events <sup>1</sup>	149	233	496	878
by type of event: <sup>2</sup>				
Negative outlook	35	15	18	68
Negative review	80	126	382	588
Downgrade	76	118	235	429
by source: <sup>2, 3</sup>				
Same agency	77	57	360	494
Different agency	112	206	347	665

<sup>1</sup> In the 60 business days prior to the rating event. <sup>2</sup> Some events were preceded by more than one event and so the sum of the number of preceding events is greater than the number of events preceded by other events. <sup>3</sup> Rating agency which announced the preceding rating event.

Source: Bloomberg. Table 1

within a day of their announcement, in the third interval. In the case of less liquid names, the full impact of a rating event might be delayed to the fourth interval.

With these criteria, the sample comprises 2,010 negative events and 325 positive events. The distribution of negative rating events is shown in Table 1. Downgrades account for 43% of the negative events, reviews 38% and outlook changes 19%. Forty-four per cent of the negative events were preceded by other rating events. Approximately 60% of these preceding events were rating announcements by other agencies.

Almost half of all negative events were preceded by other rating events

## Empirical results

We employ two straightforward statistical methods to test the impact of rating events on CDS spreads. The first is a mean test. The null hypothesis is that the mean of changes in CDS spreads adjusted by the market index is greater than zero for negative rating events and less than zero for positive rating events.<sup>8</sup> The second test is a non-parametric sign test for the median change in adjusted spreads.<sup>9</sup> The null hypothesis of the test is that half of the changes in adjusted spreads have a positive sign and half have a negative sign.

<sup>8</sup> Changes in adjusted spreads are assumed to be independent and have a Student's *t* distribution with *n*-1 degrees of freedom, where *n* denotes the number of events in the sample.

<sup>9</sup> An advantage of the sign test is that it does not impose distributional assumptions on changes in adjusted spreads. A disadvantage is that it is not well specified if the distribution of changes in spreads is skewed.

Too few positive events to give meaningful results

While the tests were carried out for both positive and negative rating events, only the results for the negative events are presented below. The results for positive events may suggest that these do not contain pricing-relevant information. However, there were too few positive events in the sample to give statistically meaningful results.

#### *Impact of downgrades*

Downgrades have a highly significant impact on CDS spreads ...

As shown in Table 2, rating downgrades have a highly significant impact on CDS spreads. Even when preceded by other rating events, the announcement of a downgrade still has a significant effect.

The impact is largest for A- and BBB-rated entities; downgrades have only a marginal impact, if any, on the adjusted spreads of AA- and BB-rated entities. The greater impact on A- and BBB-rated entities possibly reflects investors' aversion to issuers at risk of losing their investment grade status and becoming fallen angels. Many institutional investors are prevented by mandate from holding debt securities rated below investment grade. This restriction often leads them to scale back their holdings of issuers at risk of becoming fallen angels well before the firm is downgraded to below BBB-. The dislocation in the US commercial paper market in early 2001 and the sell-off in credit markets in mid-2002 were extreme examples of a shift by investors out of securities perceived to be susceptible to downgrading (see BIS (2001, 2003)).

... even when anticipated

Spreads tend to widen well before the announcement of a downgrade. This is especially true in the case of downgrades preceded by other rating events. Rating and other announcements in the 60 days prior to the downgrade appear to have a larger impact on adjusted spreads than the actual downgrade. In the case of downgrades not preceded by any other rating

Impact of downgrades on CDS spreads					
Mean change in CDS spreads adjusted by the market index; in basis points					
Rating category	Number of events	Business days before or after the event			
		[-60 to -20]	[-20 to -1]	[-1 to +1]	(+1 to +20]
Events <u>not</u> preceded by other rating events					
AA/Aa	50	–	–	–	–
A/A	132	–	–	8 **	–
BBB/Baa	114	23 **	15 **	15 **	44 *
BB/Ba	42	–	–	–	–
Events preceded by other rating events					
AA/Aa	24	–	–	–	–
A/A	142	33 ***	20 **	8 ***	–
BBB/Baa	196	87 ***	76 ***	52 ***	–
BB/Ba	76	165 ***	94 **	64 *	–
Note: *** indicates that the change in adjusted CDS spreads is greater than zero at the 1% significance level, ** at the 5% significance level, and * at the 10% significance level; – indicates that the change is not significantly different from zero.					
Sources: Bloomberg; MarkIT; BIS calculations.					Table 2

events, adjusted spreads for BBB-rated entities also widen well before the downgrade. However, in the absence of earlier rating events, market participants do not seem to anticipate downgrades of A-rated entities. This may be because they devote more resources to analysing the credit quality of BBB-rated entities – which have a greater probability of becoming fallen angels than do A-rated entities – and so may adjust more quickly to new information about the prospects of BBB-rated issuers.

#### *Impact of negative reviews*

The announcement of a negative review also has a highly significant impact on adjusted CDS spreads. Indeed, market participants react as strongly to reviews as they do to actual downgrades. This is consistent with the intent of a review, which is to warn of an impending change in a rating.

Investors react as strongly to reviews as they do to downgrades

As with downgrades, the impact of a review is significant regardless of whether the review is preceded by other rating events (Table 3). And again the effect is greatest for A- and BBB-rated entities. Reviews have a more significant impact than downgrades on the adjusted spread of BB-rated entities, but puzzlingly only when the review is preceded by other rating events: surprise reviews have no significant effect on the adjusted spreads of BB-rated entities.

Market participants appear to anticipate negative reviews, with spreads for A-, BBB- and BB-rated entities all widening in the 60 days prior to a review. Spreads for A- and BBB-rated entities continue to widen during the 20-day interval following the review. One explanation for this delayed response could be a lack of liquidity. However, given that the A- and BBB-rated segments of the CDS markets are considered the most liquid, it is also possible that new information drives the post-review widening.

Impact of negative reviews on CDS spreads					
Mean change in CDS spreads adjusted by the market index; in basis points					
Rating category	Number of events	Business days before or after the event			
		[-60 to -20)	[-20 to -1)	[-1 to +1]	(+1 to +20]
Events <u>not</u> preceded by other rating events					
AA/Aa	41	–	–	6 *	–
A/A	174	4 *	14 ***	6 **	7 **
BBB/Baa	177	19 ***	7 **	26 ***	49 **
BB/Ba	61	76 ***	28 **	–	–
Events preceded by other rating events					
AA/Aa	12	–	–	–	–
A/A	70	12 **	23 ***	12 ***	15 *
BBB/Baa	89	32 ***	45 ***	56 ***	34 **
BB/Ba	44	82 ***	71 **	131 **	–
Note: *** indicates that the change in adjusted CDS spreads is greater than zero at the 1% significance level, ** at the 5% significance level, and * at the 10% significance level; – indicates that the change is not significantly different from zero.					
Sources: Bloomberg; MarkIT; BIS calculations.					

Table 3

Impact of negative outlooks on CDS spreads					
Mean change in CDS spreads adjusted by the market index; in basis points					
Rating category	Number of events	Business days before or after the event			
		[-60 to -20]	[-20 to -1]	[-1 to +1]	(+1 to +20]
Events <u>not</u> preceded by other rating events					
AA/Aa	14	–	–	–	–
A/A	62	–	–	2 *	–
BBB/Baa	52	–	–	4 *	–
BB/Ba	22	–	–	9*	–
Events preceded by other rating events					
AA/Aa	4	–	–	–	–
A/A	39	14 *	–	2 *	–
BBB/Baa	41	–	–	5 **	–
BB/Ba	29	–	–	–	–
Note: *** indicates that the change in adjusted CDS spreads is greater than zero at the 1% significance level, ** at the 5% significance level, and * at the 10% significance level; – indicates that the change is not significantly different from zero.					
Sources: Bloomberg; MarkIT; BIS calculations.					Table 4

### Impact of negative outlooks

Outlook changes have only a marginal impact

Outlook changes have the least significant impact on CDS spreads, in both statistical and economic terms. As mentioned earlier, outlook changes are intended to be indicators of long-term trends in credit quality and may or may not eventually lead to a rating change. Therefore, it is not surprising that they have only a marginal effect on spreads.

The impact of outlook changes seems to be more significant, albeit still small, for potential fallen angels than for other entities. As shown in Table 4, only for BBB-rated entities, and only when preceded by other rating events, is the impact of an outlook change greater than zero at less than a 10% significance level. An outlook change appears to have the most informational value when it is one in a series of negative announcements about an issuer clinging to investment grade status.

### Conclusions

Evidence from the credit default swap market indicates that negative rating events have a highly significant impact on credit spreads. The effect is most pronounced for negative reviews and downgrades and least so for outlook changes. Furthermore, the impact is significant even when rating events are anticipated by an earlier widening of CDS spreads.

Two ratings seem more informative than one

Notably, the results are similar regardless of whether rating announcements are preceded by other rating events. Considering that more than half of these prior events are rating changes by other agencies, the results suggest that two ratings might be more informative than one; both the first and second credit ratings seem to contain pricing-relevant information. Cantor et al

(1997) obtain similar results, finding that in the case of split ratings both ratings affect corporate bond spreads.

The impact of rating events is most pronounced for A- and BBB-rated issuers. This could reflect the greater liquidity of these segments of the CDS market. Alternatively, it could be due to investors' aversion to issuers at risk of becoming fallen angels. In the latter case, the impact of rating announcements could be lessened by promoting the integration of the investment grade and high-yield debt markets so as to reduce the costs associated with a loss of investment grade status. This would require a change in the credit risk management practices of institutional investors to give more emphasis to internal credit assessments and less to agencies' assessments. It would also require revisions to the many regulations and statutes that restrict regulated institutions from investing in lower-rated debt.<sup>10</sup>

Impact is strongest when investment grade status is at risk

## References

Bank for International Settlements (2001): *71st Annual Report*, 11 June.

——— (2003): *73rd Annual Report*, 30 June.

Cantor, R, F Packer and K Cole (1997): "Split ratings and the pricing of credit risk", *Journal of Fixed Income*, vol 7, no 3, December, pp 72–82.

Griffin, P A and A Z Sanvicente (1982): "Common stock returns and rating changes: a methodological comparison", *Journal of Finance*, vol 37, issue 1, pp 103–19.

Hand, J R M, R W Holthausen and R W Leftwich (1992): "The effect of bond rating agency announcements on bond and stock prices", *Journal of Finance*, vol 47, issue 2, pp 733–52.

Hettenhouse, G and W Sartoris (1976): "An analysis of the informational value of bond rating changes", *Quarterly Review of Economics and Business*, vol 16, Summer, pp 65–76.

Hull, J, M Predescu and A White (2003): *The relationship between credit default swap spreads, bond yields, and credit rating announcements*, University of Toronto, June, mimeo.

Katz, S (1974): "The price adjustment process of bonds to rating reclassifications: a test of bond market efficiency", *Journal of Finance*, vol 29, issue 2, pp 551–9.

Kliger, D and O Sarig (2000): "The information value of bond ratings", *Journal of Finance*, vol 25, issue 6, pp 2879–902.

Pinches, E G and J C Singleton (1978): "The adjustment of stock prices to bond rating changes", *Journal of Finance*, vol 33, issue 1, pp 29–44.

---

<sup>10</sup> In the United States, eight federal statutes, 47 federal regulations and over 100 state laws and regulations make reference to credit ratings (US Senate (2002, p 102)).

Steiner, M and V Heinke (2001): “Event study concerning international bond price effects of credit rating actions”, *International Journal of Finance and Economics*, vol 6, pp 139–57.

United States Senate (2002): *Financial oversight of Enron: the SEC and private-sector watchdogs*, Report of the Staff to the Senate Committee on Governmental Affairs, 8 October.

Weinstein, M (1977): “The effect of a rating change announcement on bond price”, *Journal of Financial Economics*, vol 5, pp 329–50.

