EXPLORING THE RELATIONSHIP BETWEEN CDS AND RATING ANNOUNCEMENTS: A LITERATURE REVIEW AND FUTURE RESEARCH DIRECTIONS♦

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—Abstract—

This paper proposes a systematic literature review for exploring the relationship between CDS and rating announcements. To achieve this purpose, we have isolated and explored the primary relevant fields in the literature and discussed the findings. The value added of this preliminary work can be identified in the effort to identify new and promising research areas for future work.

Key Words: *CRAs, Credit Default Swap, Rating Announcements*
JEL Classification: G1, G10, G19

1. INTRODUCTION

♦ This paper is the result of a co-operation between the authors. In particular, Carè contributed to Sections 2.1, 3 and 4, Trotta contributed to Section 2,and Cavallaro contributed to Section 1.

The recent financial crisis has highlighted credit rating agencies (CRAs) and credit derivatives. Particularly, during the subprime mortgage crisis, CRAs were strongly criticised for issuing a high percentage of inaccurate credit ratings and for failing to predict dangerous situations in a timely manner (Chava et al., 2012:2). At the same time, it is undeniable that the credit default swap (hereafter, CDS) market represents one of the most significant financial innovations ($25.9 trillion (national amount) on December 31, 2011 (ISDA)).CDSs present some interesting features that allow analysis of how public and private information affects market prices. The growing interest in the literature regarding the credit derivatives market is due, therefore, to the characteristics of these contracts that make them potentially more efficient than other financial instruments in establishing the "right" price for credit risk (Di Cesare,2006:123). For this reason, there has been a recent emergence in the international debate and a growing interest by researchers regarding the relationship between the CDS and rating announcements, and this focus has emphasised the ability of the CDS to incorporate new information much faster than the release of ratings. However, despite the attention focused by scholars on this topic, the existing contributions are still deeply heterogeneous with respect to dataset type, methodology used and especially results. Starting with these considerations, this research discusses the information/predictive ability of the CDS to react to rating announcements through the systematisation of the existing contributions in the literature by outlining a comprehensive framework to identify the main issues addressed, any links and / or any common results. The method used is a systematic literature review. The paper is organised as follows. Section 2 presents the methodology used to perform the study. Section 3 reflects the typical purposes associated with a literature review: classification of research streams, identification of key research areas and synthesis of the main findings. Finally, Section 4 discusses the results and addresses further research directions.

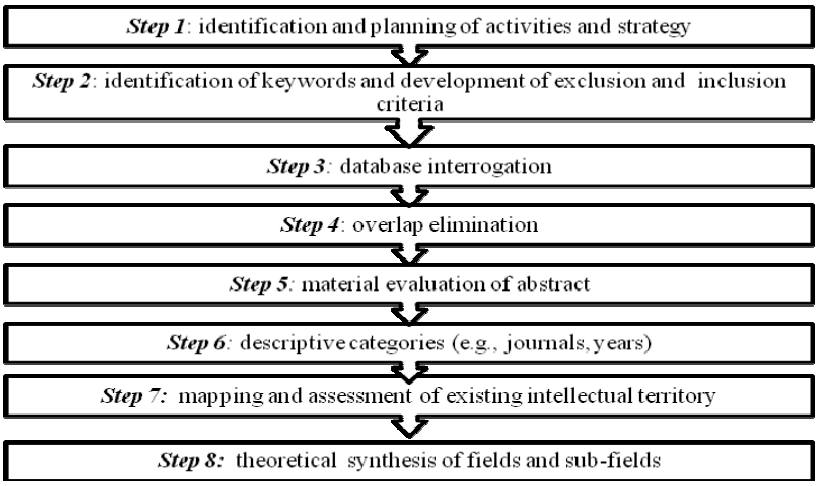
2. METHODOLOGY FOR RESEARCH AND DATA SYNTHESIS

The method used in this work is a systematic literature review that is based on a three stage procedure: data collection, data analysis and synthesis of the results (Tranfield et al., 2003:207-222). According to Tranfield et al. (2003:208), the aim of conducting a literature review is often to enable the researcher both to map and

assess the existing intellectual territory and to specify a research question that will further develop the existing body of knowledge.

The systematic nature of such a procedure improves the quality of the review process and the results obtained through the use of this transparent and reproducible method.Studies were selected using a keyword search in the main database for the social sciences: ISI Web of Knowledge (ISI) and EBSCO for the typology "subscription database" and Social Science Research Network (SSRN) and Google Scholar for the typology “open access”. Both types of databases have been integrated to obtain a better representation of the phenomenon under investigation. EBSCO exceeds all other databases available in terms of its premium content of peer-reviewed, business-related journals, while ISI provides access to the world’s leading citation databases and has a thorough journal selection process (Mikki, 2009:42). To ensure thorough coverage, we added SSRN, which has been rated the number one open access repository in the world (for July, 2012). Furthermore, while advanced researchers extensively use Google for searching, Google is not limited to refereed, high-impact journals and conference proceedings (Meho et al., 2007:2123). Therefore, for a more thorough analysis, it is wise to apply different services, such as ISI for its guaranteed reviewed scientific content and controlled citation data and Google Scholar for its wider collection of sources including books and proceedings (Mikki,2009:49). The strategies used for the realisation of this systematic review of the literature are summarised in Chart 1.

Chart 1. The literature review process



2.1 Data synthesis

The search strings used are shown in Table 1. The same search criteria were used for all databases. With respect to time period, we selected the algorithm "every year", while with respect to type of work, we selected academic journals, books, conference materials, working papers and institutional working papers. The searches produced a total of 12013 results (Table 1). An analysis of the results allowed us to detect, as expected, a large overlap among the four databases. The greater number of results is attributable to Google Scholar, which also returned results that were not a perfect match with the search expression because of its search algorithmic structure(Mikki, 2009:42). All articles obtained were analysed to verify relevance with the object by analysis of the abstracts. This step reduced the number of results related to our research topic to 212 (Table. 1).

Table 1. Results by keywords and database

Keywords	Total results					Total "valid" results				
	EBSCO	ISI	SSRN	SCHOLAR	Total	EBSCO	ISI	SSRN	SCHOLAR	Total
"CREDIT DEFAULT SWAP" and "RATING"	61	130	55	6470	6716	12	8	11	32	63
"CREDIT DEFAULT SWAP" and "CREDIT RATING AGENICES"	6	13	15	1510	1544	2	4	7	30	43
"CREDIT DEFAULT SWAP" and "RATING" and "ANNOUNCEMENT"	10	14	0	1170	1194	7	8	0	49	64
"CDS" and "CREDIT RATING AGENCIES"	1	4	14	2540	2559	1	3	9	29	42
Number of results	78	161	84	11690	**12013**	22	23	27	140	**212**

After removing the overlaps resulting from the use of the same keywords in multiple databases, 61 significant results were identified and serve as the basis for

the present work. These papers were classified according to the following variables: type of product, year and journal.The analysis of the obtained data shows a significant increase in scientific production in 2012, an increase that is likely due to the recent tensions related to the debt of sovereign countries. Further classification was performed for the papers published in scientific journals.A demonstration of the importance awarded the issue in recent years is found in the journals that have published the largest number of relevant contributions. These include Journal of Banking and Finance (16%), Journal of Fixed Income (12%),Journal of Credit Risk (8%) and European Financial Management (8%). Our classification and analysis of the identified sample are presented in Section 3.

3. THE RELATIONSHIP BETWEEN CDS AND RATING ANNOUNCEMENTS: A LITERATURE REVIEW

According to Tranfield et al. (2003:220), the aim of our systematic review is to provide collective insights through a theoretical synthesis of the related fields and sub-fields. The assessment process of selected works reveals certain leading themes. By using our search strings (see Table 1),we identify four research areas: i) studies focused on the role of the CRA in the market, ii) studies focused on CDS market characteristic and spread change determinants, iii) studies focused on the rating announcement effect, and iv) studies focused on the concept of market efficiency and implied rating. All of these areas have been explored.

The rating process is typically based on both public and private information (except for unsolicited ratings). From an operational perspective, the purpose of ratings is to measure credit risk in terms of probability of default, expected losses or likelihood of timely payments in accordance with contractual terms (Gonzalez et al., 2004:16). CRAs are perceived as powerful institutions that can influence issuer survival by affecting their access to funding markets and by affecting their funding costs. At the same time, there have been claims that CRAs simply follow the market and react to events rather than anticipatethem (Kiff et al., 2012:5). Hill et al.(2010:1309) find evidence of specialisation among agencies and evidence of stronger reactions to changes in Standard and Poor’s rating assessments than in those of the other agencies. The recent discussion indicates that credit ratings may not correspond to credit risk assignment based on realistic and correct assumptions. With respect to the second field, we find that given the relatively recent development in the CDS market, empirical works on the determinants of

credit spread changes have traditionally focused on corporate spreads. Zhang et al. (2005:5099) focus on information arising from the equity market and show that volatility and jump risk measures derived from the equity market using high frequency data, together with credit ratings, macroeconomic conditions, and firms' balance sheet information, can explain up to 77% of the total variation of CDS spreads. Di Cesare et al. (2010:5-37) provide an interesting survey of some approaches regarding the credit risk model.

On the other hand, several recent studies have investigated the effects of CRA announcements on CDS quotes. With regard to this third field, we have synthesised 3 sub-fields: the first two refer to the nature of the reference entity, and consequently, to the sample considered (corporate or sovereign), while the third also considers the price effect in other markets (as, for example, share or bond). Norden and Weber (2004:2813-2843)demonstrate the ability of markets to anticipate changes in the rating and to have a greater impact, whereby S&P and Moody's have operated the variations. Hull et al. (2004:2803) note that the CDS market anticipates all three types of negative credit events (downgrade, review for downgrade, negative outlook). Micu et al. (2006:11) instead indicate that all types of rating announcements, be they negative or positive, have a significant impact on CDS spreads.

They further argue that the impact is greatest for firms with split ratings, smallcap firms and firms rated near the threshold of investment grade. Norden (2011:20) finds that the CDS market quickly and accurately incorporates public information and that rating announcements are particularly informative when informational asymmetries are elevated. Chava et al. (2012:25)note that the stock and bond markets perceive the CDS as a viable alternative to credit ratings. Table 2 shows the main works in this area and offers a synthesis and an immediate comparison in terms of datasets, methodologies and findings.

Table 2. Synthesis of rating reaction literature*

AUTHOR	DATASET	METHOD	MAIN RESULTS
Chava et al. (2012)	Sample of credit rating changes from 1998 to 2007.The full sample consists of 1293 firms, of which 390 engage in CDS trading.	Event study Analysis	The results show that firms with a traded CDS have a smaller stock and bond market reaction to a credit rating downgrade than do firms without a traded CDS.

Castellano and Scaccia (2012)	Data cover the time period 2004 to 2009 and refer to 5 years market-wide CDSs linked to 60 firms.	Markov switching models	CDS quotes and their volatilities increase before negative announcements, implying that negative rating events are anticipated by CDS markets.
Burghof et al. (2012)	The total sample consists of 193 reference entities and covers the period 2004 to 2011.	Event study analysis	Both downgrades and upgrades have an impact on the CDS spreads.
Galil et al. (2011)	CDS data cover the period 2002 to 2006.	Event study analysis	CDS spreads change abnormally following announcements of rating changes and rating reviews. A larger proportion of these spread changes in negative events can be related to contamination.
Cathcart et al. (2010)	The CDS dataset covers the period 2004 to 2010 on 298 U.S. based continually active corporate issuers.	Event study analysis	CDS price effects were considerably greater in the pre-crisis era and document a possible spillover effect of reputational damage onto the bond rating services of the CRAs.
Micu et al. (2006)	The CDS dataset refers to 439 issuers and 2014 relatedrating announcements.	Event study analysis	All types of rating announcements,including changes in outlook, have a significant impact on CDS spreads. The price impact is greatest for firms with split ratings, smallcap firms and firms rated near the threshold of investment grade.
Lehnert et al. (2006)	All reference entities included in the TRAC-X Europe index of J.P. Morgan for the period 2000 to 2003.	Event study analysis	Downgrades and negative outlooks contain significant information, but find no evidence that announcements are anticipated by participants in the CDS market.
* We summarise the sample by selecting only main works. The corresponding author can provide a full list of references upon request.			

In our sample, we isolate the fourth field of implied ratings (IRs) (see Table 3).The aim of the market implied rating is to provide, in contrast to the standard

official rating, market-based indicators of credit quality at short and medium terms. The growing attention to this alternative formulation is demonstrated by the major rating agencies (such as Moody's and Fitch) focusing on the development of a suite of market implied ratings.

Table 3. Synthesis of IRs literature*

AUTHOR	DATASET	METHOD	MAIN RESULTS
Castellano et al. (2012)	The sample consists ofCDS quotes of 75 firms for the period 2004 to 2009.	Non-parametric mapping	Results show that there are misalignments between IRs and official ratings, which become more pronounced during the years of the sample characterised by financial turmoil.
Kou et al. (2008)	The sample consists of4183 bond issues and cover the period 1988 to 1998.	Spread-implied rating	Results show that spread-implied ratings are able to predict the future movements of agency ratings.
Remolona et al. (2008)	The sample refers to 27 small and/or emerging countries for the period 2002 to 2006.	Ratings-implied expected loss (RIEL)	The results show evidence to support the debt intolerance and original sin explanations for country risk. The new measure of expected loss from sovereign defaults with stand-alone credit ratings is more informative for measuring sovereign risk.
Chan-Lau (2003)	The dataset includes CDS spreads on Argentina's sovereign debt for the period 1998 to 2001.	Maximum recovery rate	The results indicate that the correlation between the maximum recovery rate and default probabilities turn negative in advance of the credit event and that they can be used for constructing early warning indicators of debt default.

* We summarise the sample by selecting only the main works. The corresponding author can provide a full list of references upon request.

4. CONCLUSIVE REMARKS AND FURTHER RESEARCH DIRECTIONS

While the literature shows increasing attention toward the relationship between CDS and rating announcements, there are no final and unanimously shared results. Accordingly, we present a systematic literature review. Our map of

literature demonstrates that there has been growing attention with respect to this field since the 2007 financial crisis and that such attention may have changed the response to rating news and the reputation of CRAs. From a methodological level, most of the above studies investigate the effects of rating announcements using the event-study (ES) methodology. In particular, our review emphasises that only a recent study offers a different method (Castellano and Scaccia, 2012: 239-264). Such a finding may represent a breaking point from other methodologies.

The works based on the ES methodology show some problem with regard to kurtosis and volatility clustering, which is commonly observed in CDS spread-time series. Accordingly, all works based on the ES method can result in abnormal results or inaccurate representations. With regard to the database source of CDS quotes, our review allows us to observe that the authors use different sources for data. Starting from the considerations of Mayordomo et al. (2010:1), it is possible to identify systematic differences among the data sets (as, for example, Markit, GFI, JP Morgan). The presence of different prices in different databases may cause problems with reliability and comparability of the studies. This is also true if we consider a corporate or sovereign CDS sample. The different characteristics in terms of liquidity and exchanges could lead to different results. Future research directions are therefore needed to identify the best method and the best dataset for exploring the relationship between CDS and rating news.

Our map of the literature indicates the recent implementation of IR models as alternatives for official models. IRs can be considered an alternative way to measure credit risk from the market and from its capability to adjust quickly and react to public and private news. The recent implementation of this measurement by the most important CRAs confirms that IRs may be a valid instrument for integrating the actual credit risk models and for providing valid information to the market operators based not only on the long term but the short term as well. This could be an important change in CRAs and market perspective, and for this reason, further research is needed.

Furthermore, from the analysis of the existing literature, we find that the recent financial crisis may have caused the recent important emphasis on the market efficiency theory. Starting from the argument that even if CDS are able to anticipate rating news, this does not provide added value nor does it mean that the market would be able to incorporate information (including those available to

CRAs) quickly and accurately. Moreover, the fact that CRAs must have access to public and private information and that the market may still be able to anticipate CRAs suggests there exist some important doubts that deserve investigation. As the current state of research in this area does not allow us to reach conclusions regarding the above issue, this seems an interesting aspect to be explored in the future.

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