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Market integration and efficiency of CDS and equity markets

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ABSTRACT

We test the market integration and efficiency of credit default swap (CDS) and equity markets by examining the CDS spreads of 538 US and European firms around unanticipated and sudden credit events (CEs) from 2010 to 2013. We find evidence that stock markets react prior to CDS markets, anticipating CEs to a certain extent. In particular, we find that equity returns during the two days prior to a CE have a highly significant influence on the observed CDS spread change on the day of the CE, indicating that both markets are not fully integrated yet. In addition, we find evidence that CDS spread changes display continuation patterns following positive CEs and reversal patterns following negative CEs. These patterns are in line with the Uncertain Information Hypothesis, suggesting that CDS markets are efficient, albeit lagging equity markets to a certain extent.

1. Introduction

Credit default swaps (CDS) rank among the most widely used types of credit derivative instruments and are an integral part of financial markets. Due to their comparatively high liquidity, CDS provide an accurate reflection of the market's current perception of the default risk of an issuer. CDS spreads therefore possess important information for bondholders and shareholders alike, as the default risk of a firm plays an important role in the valuation of a firm's equity as well as its debt.

Yet, the empirical evidence on parallel information processing in equity and credit markets is still incomplete and offers a conflicting picture. While there are stable results that stock markets are processing information faster than CDS markets (e.g. Forte & Peña, 2009; Norden & Weber, 2009; Trutwein & Schiereck, 2011; Wang & Bhar, 2014), the announcement effects of credit rating changes show that there are also significant information spillovers from credit to equity markets, particularly for negative rating events (e.g. Imbierowicz & Wahrenburg, 2013; Norden & Weber, 2004). As a consequence of these findings, the impression arises that stock markets have the ability to process information more quickly than debt and credit markets. However, the stock market efficiency still remains incomplete, as large debt valuation adjustments, credit rating news, and credit risk changes exert a significant influence on stock prices.

In contrast to stock and bond markets, the CDS market is still a comparatively unregulated OTC market, dominated by large institutional investors, such as banks, insurance firms, and hedge funds. It is therefore possible that these investors possess informational advantages that stem from trading in an opaque market with relatively few market participants. As a result, it is likely that the CDS market is used as a preferred channel for informed trading. The findings of Acharya and Johnson (2007) support this assumption, as they document information flows from CDS to stock markets.

However, beyond the questions of informed trading in CDS markets and the informational efficiency of stock markets, at least two more questions remain to be addressed. First, if stock markets react significantly to rating changes, and to negative rating changes in particular, are there similar observable effects to large changes in CDS spreads? And second, if generally credit markets are slower in information processing than equity capital markets, does uncertainty still need to be resolved once CDS markets adjust their valuation levels for corporate debt? This paper shows that equity markets react to large CDS spread changes and that they at least partially anticipate both, negative and positive credit events (CEs). In addition, we find evidence that CDS markets overreact to

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unanticipated credit changes. Equity markets appear to lead CDS markets by at least two days. It therefore seems as if CDS markets do not process the arrival of negative information as quickly as equity markets as they take longer to determine the actual ramifications of the CE.

In order to answer these questions in more detail, we use a twofold research approach. First, we apply a research design for stock price jumps and drops to significant CDS spread changes in order to examine whether similar observable return patterns exist. Second, we test the integration of CDS and equity markets following the approach of Wang and Bhar (2014). We analyze the CDS and stock market reaction and their integration following significant CEs, defined as being in the 1% (positive CE) and 99% (negative CE) quantile of CDS spread changes for a given rating class. As our sample consists of single-name CDS spreads of US and European firms, we also test whether firms from these two regions show different market reactions. As a result of the ongoing sovereign debt crisis in Europe, European debt and equity markets are potentially under more stress than US ones, which began to normalize in mid-2009, following the end of the 2007 financial crisis. Our results therefore complement the research of Trutwein and Schiereck (2011) and Wang and Bhar (2014), as we investigate whether markets that are under stress are better integrated than the ones in a normal market environment. Furthermore, we use multiple cross-sectional regressions to identify the drivers of CDS spread changes around unanticipated CEs and during the subsequent days.

Overall, our results suggest that stock markets react prior to CDS markets, anticipating CEs to a certain extent. In particular, we find that equity returns during the two days prior to a CE have a highly significant influence on the observed CDS spread change on the day of the CE, indicating that both markets are not fully integrated yet. In addition, we find evidence that CDS markets display continuation patterns following positive CEs and reversal patterns following negative CEs. These patterns are in line with the Uncertain Information Hypothesis (UIH) of Brown, Harlow, and Tinic (1988), suggesting that CDS markets are efficient, albeit lagging equity markets to a certain extent. Moreover, the findings show that the market response to sudden CEs differs depending on the credit risk of a firm, as measured by its Standard & Poor's (S&P) credit rating. In addition, the results of the lead–lag analysis suggest that the integration between CDS and equity markets in Europe is higher than in the US. The likely reason for this is that European credit markets are still under stress as a result of the ongoing European sovereign debt crisis. US markets, on the other hand, are under considerably less stress, as credit markets already normalized following the 2007 financial crisis.

The rest of this article is structured as follows. Section 2 gives an overview of the research on CDS markets and their relationship to equity markets. It also briefly outlines the related literature on the efficiency of stock markets. Section 3 describes the data selection process and the sample, as well as the empirical methodology for the CDS and stock event study. Section 4 presents the results of the CDS and equity market reactions to sudden CEs. Section 5 splits the sample into CDS of US and European firms and analyzes whether the CDS market reactions to positive and negative CEs differ significantly from one another. Section 6 analysis the drivers of the CDS spread changes, while Section 7 examines the lead–lag relationship of CDS and equity markets. Section 8 offers multiple robustness checks and Section 9 concludes the paper.

2. Related literature

There is an extensive and still growing literature on the efficiency of stock markets, yet few studies address the efficiency of CDS markets as a whole. Most research on CDS markets focuses on the effect of rating changes on CDS spreads and stock prices and whether or not CDS spread changes can predict rating changes (e.g. Finnerty, Miller, & Chen, 2013; Galil & Soffer, 2011; Hull, Predescu, & White, 2004; Norden & Weber, 2004). Ratings are an important determinant of CDS spread levels, and a rating change can signal either a decrease or increase in the default probability of a firm, depending on whether an upgrade or downgrade occurs. Longstaff, Mithal, and Neis (2005) show that approximately 50% of a CDS spread is determined by the default probability of a company. Another important factor that determines CDS spread levels is a non-default component related to measures of bond liquidity risks, such as the size of the bid-ask spread.

Hull et al. (2004) and Norden and Weber (2004) are among the first to show that rating announcements, such as changes in rating outlooks and actual rating changes, have a significant impact on CDS spreads. Both studies show that positive rating announcements and rating upgrades have little influence on CDS spreads at best. Only the more recent study of Finnerty et al. (2013) finds that rating upgrades are associated with a significant reduction in CDS spreads. On the other hand, negative rating announcements and rating downgrades have a decisive impact on CDS spreads. CDS spreads show a marked increase following such an announcement (Finnerty et al., 2013; Galil & Soffer, 2011; Hull et al., 2004; Norden & Weber, 2004). This suggests that there is an asymmetric response to positive and negative rating announcements, as the increase in CDS spread levels following a negative rating announcement is more pronounced than the decrease following a positive one (Galil & Soffer, 2011).

Trutwein and Schiereck (2011) analyze the interdependence of CDS spread changes and equity returns for 13 of the biggest US financial institutions. They show that CDS spread changes and equity returns are inversely related as increases and decreases in stock prices lead to subsequent decreases and increases in CDS markets. Moreover, they show that equity markets react faster than CDS markets, which in turn leads to comparatively severe adjustments in CDS spread levels. They also show that during times of heightened stress, as financial institutions experienced during 2008, equity and CDS markets become much more closely integrated than during times in which the economic situation is more benign. Falling stock prices can lead to a higher perceived default risk, which in turn leads to higher CDS spreads, which then again depress stock prices even further. This pattern can eventually result in a downward spiral, where a company will default. As the CDS spread of a firm rises, refinancing its debt will become increasingly costly, potentially leading to a default of the firm. Jorion and Zhang (2007) investigate the impact of CEs on the default risk of industry rivals. They analyze a sample of 820 single-name CDS from North America from January 2001 to December 2004. Besides bankruptcy filings, as extreme CEs, Jorion and Zhang (2007) define large increases in the CDS spread level as unanticipated CEs and show that sudden CDS spread increases also have strong effects on the CDS spreads of the firm's peers. A widening of a company's CDS spread is accompanied by similar increases in the CDS spreads of its peers. Wang and Bhar (2014) analyze the market integration of CDS and equity returns for 252 US firms between 2004 and 2010. They use panel data regression to estimate the CDS spreads and find that the stock returns during the previous five days have an influence on the CDS spread on a given day. They interpret this finding as equity markets leading CDS markets.

One of the first to investigate the effects that large and sudden changes in CDS spreads have on equity markets are Trutwein, Ramchander, and Schiereck (2011). Based on all available historic data in a given time series, they define a large change in a CDS spread as any change in excess of three standard deviations. Such large and sudden changes in the spread level lead to very strong equity market reactions. This reaction is asymmetric in nature,