A NOTE ON CREDIT DERIVATIVES AND M&A TRANSACTIONS: ANNOUNCEMENT AND ANTICIPATION EFFECTS

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Abstract

This paper analyses CDS and equity markets dynamics of acquiring companies, to explore whether those parties that are involved in M&A transactions are using their access to privileged bank information for private benefits. We find different effects on the CDS and equity markets, primarily because the range of participants on these markets and their regulatory frameworks differ. Our results suggest a stronger anticipation effect and therefore more trading on private information on the CDS market. We posit that this is attributable to its characteristics as an OTC market, and the lack of transparency. Moreover, the results of our multivariate analysis are consistent with the view that certain M&A transactions are especially vulnerable to information leakage in CDS markets.

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1. INTRODUCTION

M&A deals are generally very complex financial transactions that can involve many different financial institutions. Investment and commercial banks, as well as other financial institutions, advise the bidder and the target by evaluating assets, assisting with technical and tactical issues, and structuring the financial terms of the deal, by, e.g., providing bridge loans and issuing securities.

However, these activities create private information on the side of the financial institutions involved that, in principle, could be exploited prior to the announcement of the deal. We posit that the credit derivatives market may make a particularly attractive environment for insider trading because it is an OTC market that is not subject to any regulatory or supervisory rules.

Credit derivatives are among the most important and fastest growing financial innovations to emerge over the last decade. They have changed the structure of the financial system dramatically, and, along the way, have had at least some effect on the activity of most financial market participants.

The credit derivatives market has also become the most popular place for credit risk trading independent of other risk components. By allowing institutions to exchange their credit risk, credit derivatives products have emerged as essential tools for the management of credit risk.

Credit derivatives may be used for many reasons: 1) to manage specific individual credit risks, 2) to hedge against general credit exposure, 3) to increase the diversification of credit portfolios, 4) to speculate on changes in the reference entity's credit quality, 5) to value a bank's loan portfolios, thereby allowing the calculation of transfer prices and opportunity costs, and, finally, 6) to explore arbitrage opportunities. However, at the same time, some recent research suggests that credit derivatives also helped create the current worldwide financial crisis.

Credit default swaps (CDS) are the most widely used form of credit derivatives. CDS were originally created in the mid-1990s as a means to transfer the *credit* exposure of commercial loans. Between 2003 and 2007, the CDS market grew almost tenfold,[25] with a notional amount on outstanding credit default swaps of U.S. $57.3 trillion by June 2008.[26] The importance of the CDS market has grown concomitantly, not only as an instrument for hedging credit risk, but also as an instrument for speculation on the financial performance of a particular company. In addition, the last few years have seen a jump in the popularity of structured credit products, for which CDS are used partly as an underlying.

The importance of the CDS market to the global financial system was demonstrated when Bear Stearns and later AIG were bailed out by the U.S. government. This unprecedented act was

[25] *See, e.g., www.isda.org.*

[26] *See, e.g., www.bis.org.*

nevertheless considered necessary to avert the enormous threat to the stability of the global financial system. The CDS market has also become a significant determinant of corporate financing, as the pricing of, e.g., loans and bonds is benchmarked to actual CDS trading levels and less to the yield on loans and bonds outstanding. Norden and Wagner [2008] are among the authors who have studied the dominant role of CDS spreads in loan pricing.

In contrast to equity and bond markets, however, the market for trading credit exposure (the CDS market) remains an OTC market, where banks and other institutional investors are the primary traders and act as market makers. Because some of these banks typically have close relationships with the companies whose CDS are being traded, however, they may also be privy to private and price-sensitive information, such as merger and acquisition plans. Banks acting in an advisory capacity are particularly involved with target and deal characteristics that could impact credit risk, especially for the bidding firm. Such information could be directly exploited on the CDS market.

Despite the fact that exploiting inside information is categorically illegal and punishable by law, insider trading problems within the CDS market exist. In fact, the U.S. Securities and Exchange Commission recently brought a case again a bond salesman accused of passing confidential information to a hedge fund manager (Farrell [2009]).

Bodnaruk, Massa, and Simonov [2009] examine insider trading in investment banks, and find that many banks take positions in companies they are advising prior to M&A announcements. This may put them in a uniquely advantageous situation to realize the target premium. In addition, activity on the CDS market ahead of large M&A deals suggests that trading on private information can lead to significant pre-announcement market movements.

Given the ability of investment banks to gather private information prior to corporate events, we study announcement and anticipation effects in the equity and CDS markets around M&A transactions. We aim to provide empirical evidence on incremental information disclosures in the CDS market prior to M&A deals. For example, if market valuation effects are observable, are they consistent with information exploitation by insiders? This question has important implications for regulators and for the liquidity of the CDS market.

We analyze a sample of completed U.S. and European M&A transactions that are announced between January 1, 2005 and December 31, 2007. Cathcart, El-Jahel and L.Evans [2013] document that the volatility of CDS market returns increased dramatically after 2007. To avoid any distorting effects of an increased event-induced variance, which presents difficulties for a standard event study, we focus on the pre-crisis period only. Specifically, we focus on whether any private information of the parties involved in these transactions and their financing appeared to be used for trading in CDS and equity markets of the acquiring companies. Pre-announcement, we expect to find positive abnormal returns for acquirer's CDS, and negative abnormal returns on the equity market.

We posit further that abnormal returns will be more pronounced on the CDS market because of its structure (e.g., OTC market, lack of transparency). We believe the regulatory environment of the CDS market is also more conducive to insider trading activity.

We then use regression analysis to investigate abnormal returns on the CDS market in more detail. We expect to find a relationship between positive abnormal returns on the CDS market pre-announcement, and 1) the number of banks involved in the M&A transactions as advisors (i.e., as a proxy for the number of insiders in the transaction) times the rating level pre-transaction, 2) the rating change to "watch negative" or "watch positive" at or shortly prior to the transaction, 3) the transaction value, 4) the financing sources, and 5) the equity market reaction. Most of our results confirm the notion that insider trading is more prevalent in the CDS market with respect to certain transactions, e.g., those that create strong incentives to use non-public information due to the free-riding behaviour of informed participants. These results may have important implications for the regulation of the CDS market.

This paper is related to several different strands of the literature. First, some research has examined patterns of cross-market information flow. For example, Hull, Predescu, and White [2004] analyse the relationship between CDS and rating announcements, and conclude that the CDS market anticipates negative credit events but not positive ones. They use CDS data from the U.S., Europe, Asia, and Australia for the 1998-2002 period.

Furthermore, Norden and Wagner [2008] investigate the relationship between CDS and the pricing of syndicated loans to U.S. corporates from 2000-2005. Their results show that changes in CDS spreads can significantly explain changes in loan spreads. They use aggregated data, and show that CDS markets are more dominant in explaining changes in loan pricing than, e.g., bond yields. Norden and Weber [2004] analyse the effect of rating announcements on stock and CDS markets during 2000-2002, and find evidence of spread changes pre-announcement, but also of insignificant market reactions around positive rating announcements. They also show that CDS spread changes can predict downgrades.

Second, some more specific literature attempts to explain why there is such anticipation of corporate events in CDS markets. Acharya and Johnson [2010] analyse private equity buyout bids from 2000-2006 to examine whether the number of financing participants impacts the likelihood of insider trading prior to the bid. They study stock, option, bond, and CDS markets, and show that having more insiders leads to more insider trading prior to the bid announcement.

Acharya and Johnson [2010] also investigate insider trading in CDS markets by using the stock market as a benchmark for public information. They find significant incremental information disclosures in the CDS market that are consistent with the exploitation of non-public information by informed banks. Because such information is asymmetric, however, and consists exclusively of bad news, one can interpret this finding as consistent with banks hedging their underlying loan exposures. In particular, such a hedging motive provides banks with greater incentives to exploit private information upon negative credit news.

Acharya and Johnson [2010] also find that information disclosures increase concurrently with the number of a firm's bank relationships. This may

point to serious free-rider problems on the market for insider information. Norden [2014] focuses on the CDS market in order to analyse the interplay of public and private information. He finds a stronger CDS market reaction for firms with higher general media coverage. He also finds a positive correlation between how pronounced a firm's run-up is and the number of bank relationships, again indicating free rider behaviour on the part of the banks.

Third, our paper adds to the stream of literature that explores the conflicts of interest that can arise when financial intermediaries are simultaneously advising on financing deals (thereby receiving private information) and investing in equities. As we noted earlier, Bodnaruk, Massa, and Simonov [2009] have shown that some advisors take positions in M&A targets prior to M&A announcements. They document a positive relationship between the advisory stake and the likelihood of deal completion and termination fees. However, because these deals are not wealth-creating, their findings suggest that the advisory banks may be taking advantage of their positions by directly affecting the outcome in order to realize higher trading profits.

In a similar vein, Ivashina and Sun [2011] investigate whether conflicts of interest arise for institutional investors acting as lenders in a loan syndication. Since these investors are privy to private borrower information, there is some question about whether they take advantage of that information when trading in public securities. Ivashina and Sun [2011] examine abnormal returns on subsequent stock trades of institutional investors who have gained access to private information during loan renegotiations. They find that institutional managers with loan holdings tend to outperform other managers. And, because the outperformance takes place only during the quarter of the loan amendment, it appears they may be trading on confidential information.

We believe this paper is the first to investigate trading on private information by analysing CDS market reactions prior to M&A announcements. Because the characteristics of M&A deals are so well documented, and the players involved are clearly identified, we find it is particularly attractive from an academic standpoint to study the interrelationships of public and private information by relating CDS market price reactions to M&A deals.

The remainder of this paper proceeds as follows. The first section describes our dataset, empirical methodology, and research design. In the following section we report our results. In our last section we offer our conclusions.

2. DATA AND METHODOLOGY

2.1. Sample Selection

We collect data on the 30 largest completed M&A transactions in the U.S. and Europe each that were announced between January 1, 2005, and December 31, 2007. We obtain a total of 180 transactions. Details such as announcement date, transaction structure, financing, transaction size, and advisors come from the Thomson Financial SDC database. We obtain acquirers' Standard & Poor's (S&P) credit rating histories from Bloomberg Financial Services. We validate our sample by conducting a Factiva search to confirm announcement dates (rank dates), taking particular note of when private information becomes public.

For daily CDS levels of all 180 acquirers, we use data from Bloomberg Financial Services.[27] Furthermore, we limit our analysis to five-year CDS contracts because they are considered the most frequently traded maturity with the largest market coverage.[28] For quotes in both USD and EUR (or other currencies), we choose the contract currency of the acquirer's domicile.

Given that data on CDS 5-year contracts as well as daily stock prices are not available for all 180 announced M&A transactions, we our final sample consists 138 testable equity market events and 95 transactions with available CDS data. For daily stock return data and consolidated trading volumes, we use Thomson Financial DataStream. Finally, we use the Thomson Financial Worldscope database to obtain accounting data for the fiscal year prior to the announcement date. Following prior research based largely on Fama and French [1992], we assign all accounting variables for the fiscal year-end in year *t-1* to announcements between July and June of year *t+1*.

2.2. Estimation of Anticipation Effects

We measure acquirer stock and CDS market reactions to takeover announcements by calculating abnormal returns around disclosure dates. We use an event study analysis designed to identify abnormal returns within a well specified event period. Abnormal returns are calculated as ex post observable deviations from returns that occurred without an M&A announcement. Following Brown and Warner [1985], we apply a standard event study methodology by using a Constant Mean Return Model, and then calculating cumulative abnormal returns:

$$CAR_{i,[t_0-\tau,t_0+\tau]} = \sum_{t=t_0-\tau}^{t=t_0+\tau}\left(R_{i,t} - \overline{R}_i\right) \quad (1)$$

Where $R_{i,t}$ is the return of acquirer i at time t, and $\overline{R}_i$ is the simple average of security i's daily returns during the estimation period. We estimate market parameters based on a 50-day period from t_{-80} to t_{-30} in order to calculate abnormal returns. Our results remain quantitatively and qualitatively similar when we use different estimation periods.

Considering stock market valuation effects, we re-estimate abnormal returns for our time intervals by using the modified market model proposed by MacKinlay [1997]:

$$CAR_{i,[t_0-\tau,t_0+\tau]} = \sum_{t=t_0-\tau}^{t=t_0+\tau}\left(R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t}\right) \quad (2)$$

[27] *Pires, Pereira, and Martins (2010) use the same CDS data.*

[28] *Bloomberg calculates the arithmetic average of CDS levels obtained from various providers. The quotes are end-of-day, e.g., 5pm London time. The CDS quotes have a maturity of 5 years, and are the average between bid and ask quotes.*

Where $R_{i,t}$ is the return of acquirer *i* at time *t*, $R_{m,t}$ is security *i*'s corresponding market return at time *t*, and $\hat{\alpha}_i$ and $\hat{\beta}_i$ are parameters estimated using ordinary least squares regressions.

We use a standard t-test statistic to draw statistical inferences for the various event window cumulative average abnormal returns (CAARs). We apply this test according to Boehmer, Musumeci, and Poulsen [1991] in order to capture possible event-induced increases in variance.

Next, we base the subsequent cross-sectional regression on a [-25;+1] event window, so as to avoid any biases caused by lagged disclosures. We estimate the sensitivity of the CDS market reactions to transaction and firm characteristics, and we estimate the t-statistics of our cross-sectional regressions using White's [1980] heteroskedasticity-consistent standard errors.[29]

3. CDS AND EQUITY MARKET REACTIONS TO M&A ANNOUNCEMENTS

In this section, we examine market reactions to M&A transaction announcements. We hypothesize that an announcement is associated with a positive abnormal return because of the characteristics of the transaction and the company. We are interested in the period prior to the announcement to observe any potential insider trading.

We calculate CAARs for different event windows, and we define the announcement date[30] as day 0. Figure 1 illustrates the market reaction during the [-30;+30] event window and Table shows acquirer stock market reactions for 138 transactions (panel I) and CDS market reactions for 95 acquirers (panel II). Table shows that the period t_{-25} to t_{+1} is the main period of interest for analysing anticipation effects prior to M&A announcements.

The results in Table 1 strongly support our hypothesis of substantial market reactions to M&A transactions. Panel I shows the CAARs for the stocks. For all chosen event windows, the CAARs are negative, and most are significant at roughly the -1% level. The 41-day CAAR [-20;+20] is -3.49%, significantly different from 0. Panel II shows the CAARs for the CDS, which are all positive at between 1% and 13%, and mostly significant. Note that the CAAR in Panel II is 13.08% for the [-20;+20] window. If we compare the abnormal returns in panels I and II, we note a significant difference in how the markets react. The stock market reactions of the acquirer are negative, while the CDS market reactions are positive, i.e., a widening of the spread takes place.[31] Both reactions are in line with our expectations: Since large M&A transactions are financed with debt and/or equity, we expect the credit risk of acquirers to increase, which should be reflected in a higher CDS spread.[32] In the case of equity financing, the reaction is the opposite: On average, the stock price of an acquirer in a merger decreases when the merger is announced. This is in line with many prior studies that have found evidence of negative announcement returns, such as Asquith, Bruner, and Mullins [1983], Banerjee and Owers [1992], Servaes [1991], and Varaija and Ferris [1987]. It is also well known that negative announcement returns tend to be concentrated among stock-financed acquisitions of public targets that are larger than their acquirers (Bradley and Sundaram [2004]).

Merton's [1974] approach to default probability estimation using market information explicitly models a firm's market value, market value volatility, and liability structure over time using contingent claims analysis. A firm is said to be in default if its value falls below its debt. Therefore, distance to default narrows when the stock market decreases, because it increases credit risk and triggers higher CDS trading prices. Our results are thus in line with Merton's [1974] theoretical analysis.

4. REGRESSION ANALYSIS OF PRE-ANNOUNCEMENT EFFECTS

In the previous section, we found some support for the idea that trading on private information occurs, particularly in the CDS market. In other words, we found that banks that act as advisors in financing transactions may be anticipating a change in credit quality, and opt to buy protection on the CDS market. This leads to an increase in the CDS spread. Next, using regression models, we explore which transaction- and company-specific characteristics explain the market reactions.

[29] In unreported tables, we use variance decomposition to detect collinearity problems. We found no multicollinearity.

[30] For the announcement date, we use either the rank date, as provided by Thomson's SDC Transaction database, or a date prior to the rank date, such as when the transaction was communicated to the market. In other words, we try to use the date at which we would consider that the private information became public.

[31] Our goal here is to enhance understanding of market reactions prior to and at M&A announcements. We do not aim to compare a funded product (stock price) with a derivative (CDS) on a quantitative basis, because we expect a derivative to react more strongly to a risk factor (the probability of default). However, to get a better understanding of the funded and unfunded market, we estimate a model based on Merton [1974]. We conclude that the reactions on the stock and CDS markets in our empirical studies are in line with our simplified Merton model. However, for more highly indebted companies, i.e., those with a narrower distance to default, we find that the stock market reaction should be stronger than our empirical results indicate. This may be attributable to the difference in market structure.

[32] We use an intensity model to calculate implicit probabilities of default. We observe how the probability of default (PD) changes pre- and post-transaction announcement. By using rolling windows of different lengths, we calculate the PD relative to the announcement date, and gain a better understanding of how the results of abnormal returns translate to implicit default probabilities. Results are available upon request.

Figure 1. CDS and Equity Market Reactions to M&A Announcements

This graph illustrates CAARs from Day -30 through Day +30 for the stock market (138 observations) and the CDS market (95 observations). We calculate abnormal returns by using the Constant Mean Return Model as the normal return measure. We estimate market parameters based on a 50-day estimation period in order to calculate abnormal returns ranging from t_{-80} to t_{-30}.

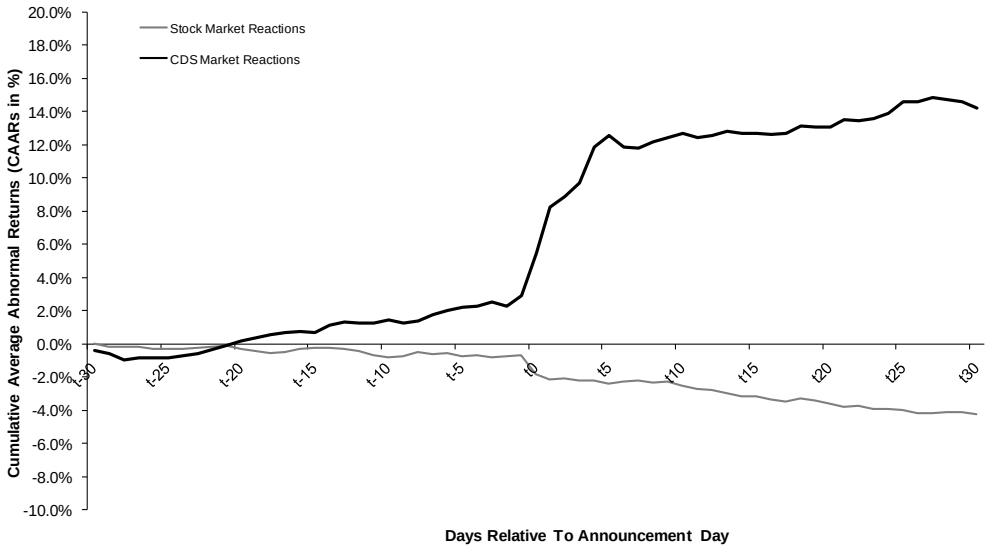

Table 1. Cumulative Average Abnormal Returns

This table reports CAARs for various event windows, the t-values, and Boehmer's z-score associated with the CAARs and tested for statistical significance. We calculate abnormal returns by using the Constant Mean Return Model as the normal return measure. We estimate market parameters based on a 50-day estimation period in order to calculate abnormal returns ranging from t-80 to t-30.

	Panel I: Stock Reactions				*Panel II: CDS Reactions*			
		Boehmer Test	*t-Test*			*Boehmer Test*	*t-Test*	
Event Window	*CAAR*	*z-score*	*t-value*	*Nobs*	*CAAR*	*z-score*	*t-value*	*Nobs*
[-20;+20]	-3.49%	-3.309***	-3.213***	138	13.08%	3.783***	3.601***	95
[-10;+10]	-1.89%	-2.622***	-2.561**	138	11.40%	3.876***	4.030***	95
[-5;+5]	-1.82%	-2.928***	-2.871***	138	10.50%	3.367***	3.838***	95
[-1;+1]	-1.41%	-2.832***	-2.933***	138	5.98%	4.187***	4.345***	95
[0;+1]	-1.50%	-3.389***	-3.446***	138	5.34%	3.751***	4.024***	95
[-1;+0]	-1.09%	-2.566**	-2.751***	138	3.17%	2.940***	3.010***	95
[-25;+10]	-0.48%	-0.810	-0.958	138	2.24%	2.350**	1.636*	95
[-25;+5]	-0.46%	-0.597	-0.724	138	3.03%	2.325**	1.554	95
[-25;+1]	-0.38%	-0.422	-0.508	138	3.70%	2.507**	1.576	95
[-25;+0]	-1.56%	-1.791*	-1.905*	138	6.23%	3.206***	2.355**	95
[-20;+10]	-0.66%	-1.748*	-1.716*	138	1.48%	1.941*	1.601	95
[-20;+5]	-0.64%	-1.273	-1.234	138	2.27%	2.056**	1.490	95
[-20;+1]	-0.56%	-0.924	-0.880	138	2.94%	2.321**	1.562	95
[-20;+0]	-1.55%	-2.172**	-2.140**	138	5.38%	3.196***	2.424**	95
[-22;-18]	-0.35%	-1.274	-1.283	138	1.12%	2.031**	1.814*	95

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

In general, there is a widespread perception in the investment community that insider trading in the CDS market has increased in recent years. The *Wall Street Journal* for example, published an article in 2006 about a study conducted by the firm Credit Derivatives Research that found unusual reactions in CDS fees ahead of news or reported rumours about 30 LBOs (see Ng [2006]). This trend could be merely a matter of scale, where more deals provide more opportunities for exploiting informational advantages. However, we believe that other M&A transaction characteristics are also fostering a greater degree of information exploitation. For example, we posit that having a larger pool of participants with advance knowledge of deals is likely to mean a higher incidence of insider trading activity.[33]

Such a hypothesis is actually not trivial. It is unclear whether having a larger number of insiders automatically means inside information will get

[33] *It is somewhat challenging to definitively show that the abnormal returns we find are due to insider trading, instead of to hedging based on the public knowledge of increasing credit risk exposure. To enhance our understanding of insider trading versus market efficiency, we calculate abnormal returns for acquirers on "watch positive" or "upgrade" only. The sample size of companies with positive credit events is very small, but we also find positive abnormal returns in this subsample. This could be considered as support for our hypothesis that insider trading is occurring.*

exploited to a greater extent. We expect that the answer depends not only on the internal conflicts of interest faced by those involved in the transaction, but also on the level of enforcement in place with respect to penalty functions. Moreover, market liquidity should also impact the incentives of insiders to engage in trading activity on the basis of advance knowledge.

Hence, we need to determine which indicators can be used as proxies for the likelihood of insider trading prior to the announcement. As shown in Table 2, we include the following proxy variables in our main regression (for the [-25;+1] event window) to explain the positive returns in the CDS market prior to an M&A announcement: equity market reaction, S&P rating level prior to the transaction in connection with the number of market makers for the respective CDS, S&P rating changes prior to the announcement, transaction size, payment method in the M&A transaction, and further financing characteristics of the respective deals.

We use two different approaches to transform the S&P credit rating: 1) We assign numbers to each rating class, i.e., higher ratings are assigned lower values (where AAA equals "1," AA+ equals "2," BBB equals "9," C- equals "25"), and 2) we use cumulative average default rates as calculated by Standard & Poor's [2008].

Table 2. Determinants of the Cumulative Abnormal Returns

This table shows cross-sectional factors of the CDS effects of M&A announcements in the U.S. and in Europe. For our estimation period, we use the [-25;+1] event window of the CAR as a dependent variable in all regressions. The exogenous determinants are: the CARs of the stock market for the period from one day prior to one day after the event (Equity Market Reaction - CAR[-1;+1]); the S&P rating level before the transaction, ranging from 1 to 25 if a company is rated between AAA and C- prior to the announcement; the number of market makers within the CDS market who also operate as advisors for the acquirer (No. of Market Makers – Acquirer); S&P rating change to "watch negative" up to 21 days prior to or at the rank date; S&P rating change to "watch positive" up to 21 days prior to or at the rank date; Value of Transaction ($mil); a dummy variable indicating whether the transaction occurred prior to 2007; a dummy variable indicating whether the transaction is financed by a preferred stock issue, borrowing, or bridge loan. Cash-only and stock-only equal 1 if the transaction is financed by cash or an acquirer's stocks only. All test statistics are computed using the heteroskedasticity-consistent covariance matrix from White [1980].

CARs CDS Market [-25;+1] -- Estimation period = 50 days			
	Model I	***Model II***	***Model III***
Constant	-0.048	-0.024	-0.088
Equity market reaction - CAR[-1;+1]	-1.658***	-1.687***	-1.236**
S&P's rating level before transaction*No. of market Makers – Acquirer	0.014***	---	0.013***
S&P's rating change to watch negative up to 21 days prior to or at the rank date	0.140**	---	0.135**
S&P's rating change to watch positive up to 21 days prior to or at the rank date	-0.194***	---	-0.149**
Value of Transaction ($mil)	< -0.001***	< -0.001**	
Merger prior to 2007	0.061	0.046	0.073
Source of Funds - Preferred Stock Issue	---	0.111***	---
Source of Funds - Borrowing	---	0.037	---
Source of Funds - Bridge Loan	---	-0.168***	---
Consid Structure - Cash only	---	---	0.013
Consid Structure - Stock only	---	---	0.004
Number of Observations	81	81	83
Adj. R^2	0.310***	0.262***	0.266***

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

We assume the equity market reaction will have a significant effect on the expected negative coefficient, i.e., the equity value decreases, as per Merton [1974], distance to default (DD) is reduced, credit risk is increased, and the spread is widened. Note from Table 2 that this is exactly what we find.

For the pre-transaction S&P rating level[34] times the number of market makers[35] (interaction term), we find the coefficient is significant to the positive abnormal returns. We thus find a negative correlation between a lower rating with the same number of market makers and positive pre-announcement movements. This suggests that trading on private information when a company has a lower rating may ultimately have a more positive effect for a dealer than trading on private information for a higher-rated company. Moreover, the worsening of a company's credit performance is more severe if the company has a lower rating prior to the announcement. This is somewhat intuitive, because there is naturally less information contained in a takeover announcement of a highly rated company. Therefore, we would not expect to see it trigger a significant widening of the spread.

In addition, we note that having more market makers involved in a transaction may lead to more positive abnormal returns. Overall, if there are more banks involved, trading on private information appears more pronounced. There may be a negative correlation between the pre-transaction credit rating of the acquirer company and the extent to which

[34] *We apply both methods of rating transformation. With the linear transformation, the interaction term is significant at a 1% level, with the historical default probabilities provided by S&P, the coefficient is significant at a 10% level. For both approaches, the interaction term shows the expected positive coefficient.*

[35] *The number of market makers refers to the number of banks involved in the M&A transaction, i.e., those with insider information that are active market participants in the CDS market. We consider all banks that contribute to credit indices, such as, e.g., iTraxx and CDX, as market makers.*

banks believe they can "hide" their insider trading. This again points to serious free-rider problems on the part of insiders, and may in turn lead to an increase in insider trading activity. Thus, the market for the respective CDS becomes more revealing.

Furthermore, we anticipate being able to use the S&P rating change to "watch negative" as a determinant up to 21 days prior to or at the rank date (announcement date). We expect a positive coefficient due to the spread widening when a company is put on "watch negative," and vice versa when a company is put on "watch positive." We would expect a negative coefficient caused by the spread tightening. As Table 2 shows, our results are consistent with this idea.

Table 3. Determinants of the Cumulative Abnormal Returns

This table shows the cross-sectional factors of the CDS effects of M&A announcements in the U.S. and Europe. For our estimation period, we use the [-25;+1] event window of the CAR as a dependent variable in all regressions. The exogenous determinants are: the CARs of the stock market for the period from one day prior to one day after the event (Equity Market Reaction - CAR[-1;+1]; the default probability based on the cumulative average default rates provided by S&P (prior to the announcement); the number of market makers within the CDS market who also operate as advisors for the acquirer (No. of Market Makers – Acquirer); S&P rating change to watch positive up to 21 days prior to or at the rank date; Value of Transaction ($mil); a dummy variable indicating that the transaction occurred prior to 2007; a dummy variable indicating that the transaction was financed by a preferred stock issue, borrowing, or bridge loan. Cash only and stock only equal 1 if the transaction is financed by cash or an acquirer's stocks only. All test statistics are computed using the heteroskedasticity-consistent covariance matrix from White [1980].

CARs CDS Market [-25;+1] Estimation period = 50 days			
	Model I	***Model II***	***Model III***
Constant	0.090**	0.077**	0.054
Equity Market Reaction – CAR[-1;+1]	-1.744**	-1.677**	-1.368**
Default Probability*No. of Market Makers - Acquirer	23.578*	23.955*	22.912*
S&P rating changed to watch positive up to 21 days prior to or at the rank date	-0.179***	---	-0.146**
Value of Transaction ($mil)	< -0.001**	< -0.001**	---
Merger prior to 2007	0.028	0.037	0.042
Source of Funds - Preferred Stock Issue	---	0.152***	---
Source of Funds - Borrowing	---	0.053	---
Source of Funds - Bridge Loan	---	-0.114	---
Consid Structure - Cash only	---	---	< 0.001
Consid Structure - Stock only	---	---	-0.011
Number of Observations	81	81	83
Adj. R^2	0.115**	0.177**	0.069***

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

In addition, we find that transaction size[36] may impact abnormal returns prior to the transaction: There is a negative correlation between transaction values and the negative values on the CARs. Hence, CARs prior to the transaction seem to be driven largely by smaller M&A transactions. We posit that, because insiders have advance knowledge of these transactions, they may tend to trade more aggressively, and this may make it easier for the market to infer their presence.

Note that funding source and transaction structure (e.g., cash or stock) could also be further determinants of abnormal returns. Regarding transaction structure, we expect a positive sign for cash-only transactions, and a negative sign for stock-only transactions. The financing requirements of cash-only transactions are more challenging: The lead investment banks on these deals typically need to contact a larger number of institutions in order to obtain sufficient financing. Of course, that suggests the potential for a higher level of insider trading.

However, our results are not consistent with this idea. The structure variables are not significant, although the source of funding variables is highly significant. While bridge loans show a negative sign, the coefficient for issuing preferred stocks is positive. Since we would generally expect the opposite, further analysis is necessary to understand this result.[37]

5. CONCLUSION

Analysing CDS returns prior to M&A announcements, especially in the context of credit crises and the role of banks, is an interesting field of research, and has not yet been covered in-depth by the academic literature. The CDS market is a very significant financial market segment that has seen enormous growth in the recent past. Nevertheless, it remains an unregulated OTC market that lacks transparency and a sound regulatory and supervisory environment.

In addition, it is a key market for pricing new issues of corporate bonds and the lending market.

[36] *We also introduce transaction size relative to the enterprise value of the acquirer, target enterprise value relative to acquirer enterprise value, and, for financial institutions, target equity value relative to acquirer equity value. We expect to find higher abnormal returns if the acquired company is larger than the acquirer, because of the higher potential financing need. The variables show the expected sign, but they are not significant. Results are available upon request.*

[37] *In unreported tables, we calculate further regression analyses on various event windows. The results for the determinants of CARs [–20, +5] and [–25, +5] support the findings in our main regression. Tables are available upon on request from the authors.*

The credit crisis showed that cash bonds and CDS do not necessarily trade in concert with each other; and the instrument of CDS can be used by banks to price new cash bonds. In the context of a company's insolvency, cash bond holders and CDS holders may have different perspectives on company value, and they may also have different intentions.

This paper studied the behaviour of insiders prior to or at M&A transaction announcements in order to investigate whether the OTC market environment for CDS tends to lead to suspicious pre-announcement trading activity. Our results suggest that insider trading does exist in these markets. However, further analysis is required to draw implications for regulators. Before we can recommend any regulatory actions to curb insider trading in CDS, we must definitively prove that it is directly harmful to certain market participants and to the general development of the CDS market.

Several interesting questions for further research arise from this study: For example, does insider trading activity cause transactions to be structured or financed differently, or to be subsequently withdrawn? Does the liquidity of the traded CDS matter for transactions? And, finally, does a welfare transfer take place? We believe future research on this issue may want to begin with questions like these.

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