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Credit derivatives and loan pricing ☆

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ABSTRACT

This paper examines the relation between the new markets for credit default swaps (CDS) and banks' pricing of syndicated loans to US corporates. We find that changes in CDS spreads have a significantly positive coefficient and explain about 25% of subsequent monthly changes in aggregate loan spreads during 2000–2005. Moreover, when compared to traditional explanatory factors, they turn out to be the dominant determinant of loan spreads. In particular, they explain loan rates much better than same rated bonds. This suggests that CDS prices contain, beyond general credit risk, to a substantial extent information relevant for bank lending. We also find that, over time, new information from CDS markets is faster incorporated into loans, but information from other markets is not. Overall, our results indicate that the markets for CDS have gained an important role for banks.

1. Introduction

Credit derivatives, famously dubbed by Alan Greenspan as the most significant financial innovation of the recent decade, are instruments which allow to purchase protection on credit exposures. While in the past credit risk was essentially untradeable, these instruments now provide banks with various methods for hedging and transferring credit risks. In their most common form, the credit default swap (CDS), they insure against the default of a credit in return for a periodic payment to the seller of protection. This payment, the price of a CDS, provides a direct measure of the compensation required by the market for insuring credit risk.[1]

In this paper, we examine empirically if and how CDS prices relate to the rates charged by banks for new loans. One would expect both to be linked to the extent that they are driven by general credit risk. Moreover, since the price on a CDS represents a bank's costs of hedging a loan, it should have a direct bearing upon loan rates.[2] Banks have also started to calculate pseudo-prices for exposures on which credit derivatives are not traded. These prices now provide loan officers with an accurate benchmark for the pricing of loans (e.g. Kealhofer, 2002, The Banker, 2003) and may thus also influence loan rates. Pseudo-CDS prices may also affect loan pricing since they are increasingly used as internal transfer prices between the bank's loan department and its credit portfolio management unit and thus have become a yardstick for loan officers (e.g. Beitel et al., 2006).

Both prices may further be linked because banks actively trade in CDS markets. Recent evidence suggests that this causes private information about borrowers to be revealed in the CDS market (Acharya and Johnson, 2007). However, besides these arguments in favor of a strong link between the two markets, there are also reasons why the relationship between loans and CDS may be weak. For example, loans may be priced based on relationship considerations, while CDS prices may be driven by liquidity and risk premia.

We provide evidence on the link between both markets by relating the credit spreads on new syndicated loans to US corporates to the spreads observed in CDS markets. We consider the period from 2000 onwards, which is the time around which CDS had

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[1] Credit derivatives are rapidly developing into liquid and widely used instruments. Only introduced a decade ago, their notional outstanding amount has reached $ 20,200bn in 2006 and is predicted to grow to $ 35,000bn in 2008 (British Bankers' Association, 2006). An alternative is the market for loan sales which has been developing rapidly as well (Gorton and Pennacchi, 1995). A key difference is that when the bank hedges with CDS, it keeps the loan. This allows to continue servicing and may thus be less harmful for the bank-firm relationship.

[2] Although reliable data is difficult to come by, especially large banks seem to hedge using credit derivatives. For example, Deutsche Bank announced in 2003 that it plans to hedge all loans with a duration of more than 180 days with credit derivatives (Walter, 2003).

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become widely used and their pricing reliable. Furthermore, we use aggregate data in our study, which allows to examine loan rates at regular intervals (monthly in our data).[3] Our main finding is that there is a close relationship between both markets. Monthly changes in CDS spreads are very significant in explaining loan spread changes of the subsequent month. The coefficient is near one, suggesting that a one basis point change in the CDS spread translates into a one basis point change in the loan spread. Overall, CDS spreads can explain about 25% of the total variation in loan spread changes.[4] When controlling for a variety of traditional loan pricing factors, the CDS spread remains strongly significant and emerges as the by far most important determinant of loan prices. In particular, CDS spreads clearly dominate the natural alternative benchmark for loan pricing, the spreads on same rated bonds. In regressions where both variables are included, the bond spread is insignificant. And when considered in isolation, it only adds little explanatory power. This is noteworthy since in accordance with previous studies we find bonds and CDS spreads changes to be highly correlated and both driven by market credit risk factors. Thus, while CDS and bonds both reflect general credit risk, CDS additionally contain a considerable amount of information relevant for the lending business. This, perhaps surprising, finding is consistent with CDS having an impact on loan rate setting, arising because CDS spreads represent the costs of hedging loans, or simply because they provide the pricing benchmark. An alternative explanation is that CDS reflect information for lending because of banks' active role in this market.[5] Furthermore, we also find that new information from CDS markets is faster incorporated into loans over time. This suggests that either CDS markets or the pricing of loans by banks (or both) have changed. CDS markets have presumably become more efficient in recent years. Hence, they should incorporate new information quicker, which per se *increases* the lag of the loan market. Changes in CDS markets are thus an unlikely explanation of the shortening of the lag, suggesting that it is due to banks pricing new information faster into loans. Interestingly, we find that this development seems to be limited to information from CDS prices: the relation between loan spreads and non-CDS information has not become more contemporaneous during the sample period. This suggests that the CDS markets have led to a change in banks' loan pricing behavior. To sum up, we find that loan rates and CDS prices are strongly related. Moreover, our results indicate that the link comes to a substantial extent through the lending business itself and not through general credit risk. This suggests an important relationship between CDS prices and bank lending.

Recent empirical studies have addressed other aspects of credit derivatives and bank lending. Acharya and Johnson (2007) provide evidence for insider trading in the CDS market and show that it is related to the number of bank relationships of a traded reference entity. They argue that this is consistent with banks using CDS markets to exploit their informational advantage from the lending business. Our finding of the CDS market containing substantial lending-relevant information is supportive of such a role of banks in CDS trading. Marsh (2006) considers the impact of the announcement of a new bank loan on a firm's public debt (James, 1987). He presents evidence that the announcement effect is lessened when the lending bank actively trades in credit derivatives. This suggests that the uniqueness of bank loans is eroded through credit derivatives, consistent with the theory that hedging may undermine monitoring incentives (e.g. Morrison, 2005). Hirtle (2007) shows that US banks which purchase protection using credit derivatives increase their supply of loans; the results in this paper suggest that credit derivatives also interact with the pricing of loans.

This paper considers the time series dimension of loan rates whereas the loan pricing literature has mostly focused on explaining differences in loan rates across borrowers (e.g. Strahan, 1999). A few papers have also considered the relationship with bond spreads. For example, Angbazo et al. (1998) and Thomas and Wang (2004) provide evidence that markets for HLT loans and high-yield bonds are linked but not fully integrated and that the determinants of the cross market relation have changed over time. Cook and Spellman (2005) compare prices on loans and bonds of the same borrower. They match prices at the date of loan origination and find that for highly rated firms, loan rates command a premium over bonds; while for lower rated firms they are discounted. Altman et al. (2006) study the relation between secondary market prices for loans and bonds and find that loans react more strongly than bonds prior to an information sensitive event but react less in the period immediately before and after the event. This suggests a monitoring advantage of traded loans over bonds.

While our study is the first to establish a relationship between credit derivatives and pricing in primary markets, previous literature has studied their interaction with secondary market prices (e.g. Hull et al., 2004; Norden and Weber, 2004; Blanco et al., 2005; Houweling and Vorst, 2005). This research is based on a higher frequency (since secondary market data is available on a daily basis) and finds that CDS markets, compared to bond and equity markets, provide a substantial part of the overall price discovery. Our results suggest that CDS markets may be even more important for primary loan markets, as market-related information relevant for lending seems to come primarily from this market.

The remainder of this paper is organized as follows. Section 2 further discusses the potential link between credit derivatives and loan pricing. Section 3 describes the data and reports summary statistics. Section 4 contains the empirical analysis. The final section summarizes and offers conclusions.

2. The potential link between loan pricing and credit derivatives: A short discussion

A priori, it is not clear whether and to what extent CDS and loans spreads are related. We are not aware of any studies analyzing this relationship either theoretically or empirically. Clearly, both spreads should price general default risk. Additionally, as mentioned before, loan prices could be connected to CDS prices since the latter represent the cost of hedging or because they serve as a pricing benchmark. Both markets may also be linked because trading by banks leads to a revelation of information about borrowers in the CDS market.

However, there are also several, rather important, arguments against a strong relationship between the pricing of loans and CDSs. Perhaps the most important are the following ones. First, the bank-firm relationship (and the bargaining power of both sides) may have a considerable influence on loan pricing decisions. This may, for example, lead to intertemporal smoothing in loan pricing (Berger and Udell, 1992), and hence reduce the link to CDS spreads. Second, in addition to the lending business banks offer many additional financial services like payment transactions, underwriting, etc. to firms. In contrast to interest margin-based activities like lending and deposit taking, these businesses typically earn fee income. Accordingly, banks may underprice loans if they can compensate lower lending margins with a relatively high net fee income (see Bharath et al., 2007) or when there are informational economies of scope (Drucker and Puri, 2005). If this cross-product subsidization is dominant in banks' loan pricing,

[3] At the firm-level, new loans and thus potential changes in loan rates occur only infrequently and irregularly.

[4] By means of comparison, firm-level studies can typically explain in total about 25% of (weekly) bond spread changes using a wide set of explanatory factors (e.g. Collin-Dufresne et al., 2001, Blanco et al., 2005).

[5] By contrast, bond markets are dominated by buy-and-hold investors and hedging credit risk is difficult there.