



CDS pricing and accounting disclosures: Evidence from U.S. bank holding corporations around the recent financial crisis[☆]



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ABSTRACT

We investigate what accounting information is important for explaining the credit risk for U.S. bank holding corporations (BHCs) during the recent crisis and find that several CAMELS variables are significantly associated with credit default swap (CDS) spreads. Consistent with industry experience, BHCs with more real estate loans do have higher credit risk as measured by CDS spread. With the newly available finer disclosures for the securities account, we find a positive association between risky assets-backed securities (ABS) and CDS spreads. Our results confirm real estate risk as a major risk for U.S. BHCs during the recent financial crisis. Moreover, our study highlights the importance of distinguishing loans/securities investments by type in understanding the relationship between accounting information and bank credit risk. In addition, we do not find significant association between several accounting-based risk measures and the CDS spread, a forward-looking market-based risk measure.

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1. Introduction

Numerous banks and other financial institutions have failed or were bailed out by governments around the world during the recent financial crisis. These widespread failures, coupled with the massive write-downs of loans and securities in the banking industry, came as a surprise to regulators and the financial community¹. In particular, regulators and bond-rating agencies were unable to identify these problems in a timely fashion. However, hedging

instruments, such as credit default swaps (CDS), may have been a timelier indicator of credit risk before and during the financial crisis. To understand the effectiveness of this new instrument, we need to know what information is impounded in CDS prices. Kaplan (2011) urges researchers to examine which accounting disclosures are important in pricing CDS. Thus, we examine some selected accounting information that is important for explaining the credit risk for U.S. bank holding corporations during the recent crisis.

The banking industry offers a unique context for studying the relationship between CDS spreads and underlying accounting disclosures for a number of reasons. First, banking is an industry where risk-taking incentives and opportunities are greater relative to other industries. Given the call-option nature of bank equity, banks have strong incentive to lend aggressively and take on excessive risks, often ignoring prudent risk management (Merton, 1977). The lower a bank's capital base, the less it has to lose and the greater its potential gain through aggressive lending and other high risk activities. Bank depositors also have fewer incentives to monitor excessive risk-taking due to deposit insurance that cover their losses. Therefore, the banking industry provides a powerful setting for examining risk-taking behaviors captured by CDS spreads.

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¹ The FDIC Quarterly's review of banks for the first quarter of 2007 highlights the total net income of \$36.0 billion for insured commercial banks and savings institutions as the fourth highest amount ever reported without any mention of an impending banking crisis.

Second, relying exclusively on market information leads to possible pitfalls while accounting information has a potentially important role to play in predicting distress (e.g., [Das et al., 2009](#)). Banking regulators already use some reported accounting variables as key indicators of risk. U.S. regulators use the Uniform Financial Rating System, commonly known as CAMELS ratings, to assess the health of individual banks². Following an on-site examination, bank examiners assign a score from one (best) to six (worst) for each of the six CAMELS components, as well as a single summary measure, known as the “composite” rating. In most cases, the intensity of regulatory monitoring and supervision is based on the composite CAMELS rating. A CAMELS rating for banks should incorporate important information regarding bank fundamentals and credit risk. The literature indicates that CAMELS indicators predict bank failures (e.g., [King et al., 2006](#)). Given this, we expect a significant relationship between CDS pricing and CAMELS variables.

Finally, and perhaps most importantly, the recent financial/banking crisis provides a unique setting for examining whether these accounting measures were effective indicators of risk and whether they were properly priced in new hedging instruments such as CDS. We focus on large U.S. bank holding corporations (BHCs) primarily due to the “too-big-to-fail” concern from a macroprudential perspective of bank regulation (e.g., [Huang et al., 2012](#)). We exploit rich accounting data for U.S. BHCs that not only include CAMELS indicators but also include a breakdown of loan types and types of securities investment. This allows us to conduct a finer analysis of accounting information than existing studies (e.g., [Callen et al., 2009](#); [Das et al., 2009](#); [Hasan et al., 2015](#)).

Our main predictions are as follows. First, motivated by the previous research relating CAMELS ratings to bank troubles or failure ([Cole and White, 2012](#); [Jin et al., 2011](#)), we predict a strong association between CAMELS variables and CDS spreads. More specifically, we expect higher capital ratios and higher liquidity to be negatively related to CDS spreads. We also anticipate lower asset quality and accounting losses to be positively associated with CDS spreads. As observed during the recent financial crisis, banks with greater exposure to real estate loans appear to experience more troubles. Using the newly available finer disclosures for the securities account, we expect a positive association between risky assets-backed securities (ABS) and CDS spreads. In addition, we empirically test whether a positive association exists between the proportion of real estate loans and CDS pricing. Finally, we predict a positive relationship between CDS pricing and accounting-based risk measures, such as the standard deviation of historical returns on assets, the standard deviation of the historical net interest margin, and the Z-score. However, whether accounting-based risk measures are timely indicators of credit risk remains primarily an empirical question.

Our data on CDS spreads is from the Markit Group Ltd. and span the period from 2001 to 2008, encompassing both the pre-financial crisis and crisis periods. Bank accounting data are from the call reports available from Federal Reserve Bank of Chicago. The final merged dataset consists of 609 firm–month observations from 27 bank holding corporations for the 2001–2008 period. We report several key findings. First, a strong relationship exists between some of the CAMELS components and CDS spreads. Three of the four CAMELS variables that we examine have a significant association with CDS spreads. We find that higher liquidity is associated with lower bank risk. In particular, cash, cash due from other banks, and securities held by the bank, as well as long-term broker deposits,

are negatively associated with CDS spreads. Consistent with our prediction that lower earnings are an indicator of higher bank risk, a positive and statistically significant relationship exists between quarterly loss and CDS spreads.

It is important to note that risky Asset-Backed Securities (ABS securities) have a positive association with CDS spreads. Moreover, two of the loan categories, particularly the higher proportion of single-family residential mortgage loans, are positively associated with CDS spread. These results are consistent with the findings of earlier studies. For example, [Bhattacharyya and Purnanandam \(2011\)](#) find that banks with higher real estate loans experience lower stock market performance. [Bessler and Kurmann \(2014\)](#) provide evidence that real estate risk, rather than interest risk, is assessed by the capital market as a major factor for explaining bank stock returns during the recent financial crisis. Our results support the prediction that accounting disclosures are important in pricing CDS contracts. In addition, our results highlight the importance of distinguishing loans/securities investments by type.

Finally, we do not find a statistically significant association between CDS spread and traditional accounting-based risk measures, possibly because CDS spread is a forward-looking risk indicator, whereas traditional accounting-based risk measures are more likely to capture current and past risks.

This study adds to the literature on the usefulness of accounting variables for pricing bank credit risk. Our paper is most closely related to the work of [Hasan et al. \(2015\)](#) that examine the applicability of market-based structural models and accounting-based bank fundamentals to price bank credit risk for a sample of global banks. However, the accounting information in their study is limited to CAMELS indicators. In addition, due to data restrictions, their study focused on the annual frequency, while ours considers a higher frequency, thereby enabling us to compare the timeliness of accounting information and CDS market information. Our finding suggests that CDS could serve as a timely bank risk indicator to market participants and regulators³. In addition, it sheds light on the lagging quality and vulnerability to manipulation of accounting-based bank risk measures.

More importantly, richer data for U.S. BHCs enables us to conduct a finer-grained analysis of accounting information, such as the breakdown of loans and securities investment by type. In particular, newly available finer disclosures exist for the securities account, including investment in ABS securities by U.S. BHCs. Based on the finer analysis, our results suggest that an aggregate measure of loan-to-security ratio by asset class is not sufficient for investors and regulators to evaluate the bank risk. This is consistent with [Duchin and Sosyura's \(2014\)](#) finding that bailed-out banks initiate riskier loans and shift assets toward riskier securities, although this shift within the same asset class remains undetected by regulatory capital ratios.

The remainder of this study is organized as follows. Section 2 provides background information regarding credit default swaps. Section 3 reviews the relevant literature and develops our predictions. We describe our sample and research methodology in Section 4. Section 5 presents our results, while Section 6 discusses our conclusions.

2. Background information on credit default swaps

The credit default swap (CDS) is a credit derivative that came into existence in 1994 in an effort to hedge fixed income investors' credit risk. The underlying fixed income security of a CDS contract

² The most widely known rating system for banks is the CAMELS system, which stands for Capital Adequacy, Asset Quality, Management, Earnings, Liquidity, and Systematic Risk. We focus on the four measures of CAMELS based primarily on disclosed accounting numbers—namely, capital adequacy, asset quality, earnings, and liquidity.

³ Our inference is also consistent with the anecdotal evidence from the memoirs of [Paulson \(2011, pp. 91 and 224\)](#) and [Bair \(2012, pp. 95 and 123\)](#), the former Treasury Secretary and FDIC Chairwoman, respectively.

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