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Corporate liquidity and the contingent nature of bank credit lines: Evidence on the costs and consequences of bank default

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ABSTRACT

I study the impact of Lehman Brothers' bankruptcy and resultant inability to honor its obligations as a lender under committed credit lines. Firms that lost access to a credit line committed by Lehman Brothers experienced abnormal stock returns of −3%, on average, on the day of and day after Lehman's bankruptcy filing, amounting to roughly $5.7 billion in aggregate, risk-adjusted losses. These losses were significantly larger for firms that were more financially constrained, firms with less cash, firms for whom Lehman was a lead-bank, and firms that lost access to larger amounts of committed credit. During the four quarters immediately following Lehman's collapse, firms that lost access to a credit line cut their investment spending significantly while simultaneously hoarding more cash than comparable firms. Overall, these findings indicate that firms that lost access to a credit line incurred economically significant costs and real-side consequences as a result of Lehman's default on its loan commitments.

1. Introduction

The question of how and why firms manage their liquidity has become increasingly important to corporate finance research and practice. Until recently, empirical research on corporate liquidity has focused exclusively on cash holdings as a source of liquidity when firms face capital market frictions. However, a growing body of empirical literature suggests that bank credit lines have become an essential facet of corporate liquidity management.[1]

A line of credit, sometimes called a loan commitment or revolving credit facility, is a contractual agreement in which a lender (usually a bank) promises to loan amounts requested by a borrower at predetermined terms, up to a predetermined limit, and during a predetermined time period.[2] Much of the extant theoretical and empirical research on bank credit lines in corporate finance is predicated on the notion that, like cash holdings, lines of credit serve as a form of insurance against states in which internal cash flows are insufficient to fund profitable investment opportunities or meet contractual obligations. Theory suggests that firms' demand for this

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[1] For example, Sufi (2009) finds that 85% of U.S. public firms have access to credit lines, while Lins et al. (2010), in their survey of public and private firms from 29 countries, find that the median firm has a line of credit equal to 15% of assets.

[2] Unlike capital market investors, banks have unique screening and monitoring abilities that mitigate information asymmetry problems. Banks can thus commit to provide liquidity to informationally problematic borrowers whereas capital market investors cannot (Boyd and Prescott, 1986; Diamond, 1984, 1991; Fama, 1985; Ramakrishnan and Thakor, 1984).

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liquidity insurance is driven by the presence of market frictions, such as information asymmetry and incentive problems, which make raising external capital in the spot market inefficient in some states of the world.

This notion of liquidity insurance underpins the theoretical models of credit lines in Boot et al. (1987), Berkovitch and Greenbaum (1991), Martin and Santomero (1997), Holmstrom and Tirole (1998), Shockley and Thakor (1997) and Thakor (2005) and models of cash holdings in Kim et al. (1998), Almeida et al. (2004, 2011) and Acharya et al. (2007). Cash holdings and credit lines are thus conventionally viewed as substitute sources of liquidity, an idea that has received considerable support from surveys of corporate executives by Campello et al. (2010, 2011). However, as argued by Demiroglu and James (2011) and Lins et al. (2010), credit lines and cash are not perfect substitutes. Whereas the liquidity insurance from cash holdings is available in virtually all states of the world, access to credit lines is contingent on both the financial condition of the borrower and the lender. In particular, a lending bank typically has the right to deny a borrower's request for funds if the borrower violates a loan covenant (Demiroglu and James, 2011; Ivashina and Scharfstein, 2010; Sufi, 2009). Alternatively, a bank may simply refuse to honor its obligations to provide committed credit due to its own insolvency (Demiroglu and James, 2011; Ivashina and Scharfstein, 2010).

The state-contingent nature of credit line access and the concomitant implications for corporate liquidity management is a topic that has received relatively scant attention in the extant literature. With the exception of Acharya et al. (2013),[3] existing theories ignore this feature of credit lines altogether. However, a recent empirical study by Ivashina and Scharfstein (2010) suggests that the contingent nature of bank credit lines factored prominently into firms' liquidity management decisions during the recent financial crisis of 2008–2009. Specifically, Ivashina and Scharfstein (2010) document a de facto "run" on banks by corporate borrowers during the peak of the crisis (fourth quarter of 2008) whereby firms drew heavily, *en masse*, on their existing lines of credit. These authors present anecdotal accounts of firms disclosing explicitly that they had no immediate need for the drawn funds, with some firms expressing concerns over banks' future ability and willingness to honor their commitments under existing credit lines.[4]

Since hoarding funds drawn under a credit line is not costless, the anecdotal evidence for the "draw now, just in case" phenomenon presented by Ivashina and Scharfstein (2010) indirectly suggests that firms foresaw significant costs stemming from the prospect of losing access to their credit lines during the financial crisis. However, no direct empirical evidence on the existence or magnitude of such costs has been documented in the literature. This study fills this void by asking and empirically testing the following research questions: (i) What are the consequences and associated costs, if any, of losing access to a line of credit during a banking crisis? (ii) Are such costs/consequences driven by the availability of other sources of liquidity (e.g., cash holdings or profits), the firm's investment opportunity set, financial constraints, or the nature and strength of the firm's relationship with the lending bank? (iii) How and to what extent does a negative shock to committed credit affect real-side corporate decisions, such as investment or cash savings policies? These research questions have important implications for our understanding of the relevant tradeoffs in the choice between credit lines and cash in corporate liquidity management, and new insights into these questions have the potential to inform future theoretical and empirical research, corporate finance in practice, and public policy pertaining to the costs and benefits of government intervention into failing banks. In this paper, I use the collapse of Lehman Brothers in September 2008 and the bank's resultant inability to fund its borrowers' requests for funds under committed lines of credit as a natural experiment to address these questions.

On September 15, 2008, Lehman Brothers, then the world's fourth largest investment bank by assets, filed for Chapter 11 bankruptcy protection. Historically, large distressed financial institutions have avoided bankruptcy through government rescues or by being acquired by other financial institutions, often with facilitation from the federal government. However, Lehman Brothers was allowed to fail. Lehman was best known for traditional investment banking services, such as securities underwriting and M&A advising, but the bank also had a significant presence as a lender in the syndicated loan market.[5] After declaring bankruptcy, Lehman ceased honoring its commitments to borrowers under its syndicated credit lines. Although Barclays agreed to purchase Lehman's North American investment banking assets the day after the bankruptcy filing, Lehman's loan commitments were not included in the deal and therefore remained unfunded as a part of the bankruptcy estate.[6] Lehman's collapse thus provides a unique natural experiment to examine the costs of lost credit line access and the corresponding implications for corporate liquidity management.

Using Thomson's Dealscan database on syndicated loans and SEC filings, I identify 73 non-financial, non-utility firms that had an active credit line committed by Lehman Brothers at the time of the bank's collapse. I conduct an event study of these firm's abnormal stock returns during the days surrounding Lehman's bankruptcy announcement. This empirical strategy is motivated by the rationale that any material costs stemming from the loss of credit line access should be imputed into stock prices, thus resulting in significant stock price declines. Lehman's complete collapse and resultant bankruptcy filing is well suited for this purpose because it was sudden and, to a large extent, unexpected by market participants,[7] thus providing an identifiable and relatively short event period for the

[3] In the model of Acharya et al. (2013), liquidity shocks to the corporate sector induce firms to draw on existing credit lines. The banking sector may be unable to fully fund drawdowns if a large enough fraction of firms is hit by the same shock. Thus, the banking sector's ability to meet the aggregate liquidity needs of the corporate sector is a function of the extent to which firms are subject to correlated liquidity shocks, and thus correlated exposure to liquidity shocks across firms creates a cost to credit lines.

[4] As discussed by Ivashina and Scharfstein (2010), drawing on a credit line in the current period in anticipation that the lender will be insolvent in a future period (and therefore unable to fund future drawdowns) is a viable strategy for a firm that wishes to preserve liquidity because credit line agreements do not permit a lender to force early repayment due to changes in the lender's financial condition. Hence, a borrower can draw down a credit line before its bank becomes insolvent. As long as the borrower continues to meet its obligations under the loan contract (interest payments, covenants, etc.), the borrower has the right to hoard the borrowed funds until the loan matures.

[5] According to Thomson Reuters Loan Pricing Corporation (LPC), in 2007 Lehman Brothers acted as lead arranger for $46 billion of syndicated loans to U.S. firms and had the 8th largest market share among all lead arrangers.

[6] See "Exhibit A: Asset Purchase Agreement Among Lehman Brothers Holding Inc., Lehman Brothers Inc., LB 745 LLC, and Barclays Capital Inc.," docket #280, *In re Lehman Brothers Holdings Inc.*, 08-13555, U.S. Bankruptcy Court, Southern District of New York.

[7] The market's surprise at Lehman's bankruptcy is evidenced by the fact that the stock market experienced one of its worst single day losses in history on the day of Lehman's bankruptcy filing, indicating that a large probability of failure had not been priced.