



The use of bank lines of credit in corporate liquidity management: A review of empirical evidence

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ABSTRACT

This paper reviews empirical evidence on the use of bank lines of credit as a source of corporate liquidity. Traditional explanation for lines of credit is that they provide insurance against liquidity shocks, in much the same as way hoarding cash does. However, recent empirical research suggests that access to lines of credit is contingent on the credit quality of the borrower as well as the financial condition of the lender. These findings suggest that lines of credit are an imperfect substitute for cash as a source of corporate liquidity.

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1. Introduction

Firms need liquidity to honor their contractual obligations and undertake valuable investment projects when they arise (Keynes, 1936). While large public corporations can raise liquidity from capital markets when they need it, most firms have high transaction and asymmetric information costs of accessing capital markets and thus need to reserve some form of liquidity.

Until recently, empirical research on corporate liquidity management (see e.g., Opler et al., 1999; Almeida et al., 2004; Faulkender and Wang, 2006) exclusively focused on cash as a source of liquidity in the presence of capital market frictions. The well-known result from this literature is that firms with external financing constraints save more cash out of their cash flows, especially if investment opportunities are likely to arise when cash flows are low (Acharya et al., 2007).

While holding cash provides financial flexibility, managers might be tempted to use their firm's cash reserves opportunistically and at the expense of the firm's shareholders rather than preserving cash holdings until the arrival of valuable projects. For

example, Dittmar and Mahrt-Smith (2007) and Harford et al. (2008) find evidence that entrenched managers are more likely to build excess cash balances, but spend excess cash quickly. Also, Harford (1999) finds that cash-rich firms are more likely to make acquisitions and their acquisitions are more likely to be value decreasing. Similarly, Kalcheva and Lins (2007) find that when country-level external shareholder protection is weak, firm values are lower when controlling managers hold more cash.

Theory suggests that bank lines of credit, also known as loan commitments or revolving credit facilities, are more efficient liquidity buffers than cash holdings (see e.g., Holmstrom and Tirole, 1998). Banks can commit to provide liquidity to informationally problematic borrowers at a future date while capital markets cannot because banks have special screening and monitoring abilities that capital market investors do not have (Diamond, 1984, 1991; Ramakrishnan and Thakor, 1984; Fama, 1985; Boyd and Prescott, 1986) and synergies in lending and deposit taking provide banks with a natural hedge that reduces the cost of supplying liquidity when corporate sector's liquidity demand rises (Kashyap et al., 2002; Gatev and Strahan, 2006).

From a firm's perspective, there are at least three potential advantages of bank lines of credit relative to cash. First, lines of credit entail commitments to provide firms with liquidity only when valuable investment projects arise, which helps overcome

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Fig. 1. Average cash/(assets-cash) for industrial US public firms (1996–2009). Source: Compustat.

managerial agency problems associated with holding cash. Second, in most cases, cash earns less than the debt used to fund it. Third, while firms deduct interest payments on credit lines from taxable income, they pay taxes on interest earned on cash that they hold.

Despite the prediction that firms should mainly use bank lines of credit for their future liquidity needs, public firms hold significant amounts of cash on their balance sheets and their cash holdings were increasing until very recently, as shown in Fig. 1.¹ One potential explanation for this is very risky firms' inability to obtain credit from banks. However, according to Sufi (2009) and Demiroglu et al. (2009), 87% of public firms and 64% of large private firms have access to lines of credit. Moreover, even among firms that have access to lines of credit, on average, cash holdings exceed the size of the firm's line of credit. To resolve this puzzle, it is helpful to understand the limitations on the use of bank lines of credit as a source of liquidity, whether bank lines of credit are viable liquidity substitutes for cash holdings as suggested by theory, and how firms decide whether to use cash or bank lines of credit. Our goal in this paper is to review empirical studies that attempt to answer these questions. We also summarize empirical evidence on firms' liquidity choices during the recent credit crisis. We conclude by discussing directions for future research.

2. Theoretical background

The first step in modeling a firm's liquidity choice is to identify the source of liquidity demand. In a frictionless world, firms do not need liquidity because they can obtain external financing for valuable projects when they arise. However, if transaction costs, asymmetric information, or incentive problems raise the cost of external financing, it might be valuable for the firm to reserve some form of liquidity for their future financing needs. Holding liquidity insures the firm against the states of the world in which internally generated funds are not sufficient to fund contractual obligations and positive net present value (NPV) projects. This insurance idea is behind the most models of cash savings (e.g., Almeida et al., 2004; Acharya et al., 2007) and credit lines (e.g., Boot et al., 1987; Holmstrom and Tirole, 1998).

For example, Almeida et al. (2004) model a firm's liquidity demand and argue that the firm saves cash out of cash flows (i.e.,

reserves liquidity) only if it anticipates being financially constrained in the future. As a result, reserving cash allows for intertemporal transfer of the firm's cash flows and helps the firm absorb cash flow shocks. The optimal amount of cash savings in their model depends on the tradeoff between the cost of reducing investment to save cash now and benefits of more investment in the future. Acharya et al. (2007) refine this idea by arguing that financially constrained firms will save cash out of their cash flows if they expect profitable projects to arise when the firm has low cash flows. In other words, in the presence of external financing frictions, constrained firms transfer liquidity from high cash flow states with low investment opportunities to low cash flow states with high investment opportunities in order to optimize investment. These models suggest that, from a valuation perspective, cash is not simply negative debt (and thus for valuation purposes, subtracting cash in excess operating requirements from total debt to determine leverage may not be appropriate). Put differently, transaction and information costs imply that combinations of cash and debt that result in the same amount of net debt have potentially different valuation implications. In addition, these models do not consider bank lines of credit as an alternative source of liquidity although firms emphasize in their annual reports the importance of bank-provided liquidity.

Theories on credit lines are based on a similar insurance idea. For example, Boot et al. (1987) have a three-period model with moral hazard. In the first period, the entrepreneur chooses a costly effort level that positively affects the payoff from his project and in the second period he raises liquidity from the spot market to fund the project. His initial effort level is unobservable to creditors in the spot market. In this set up, the likelihood of an interest rate shock in the spot market in the second period reduces the expected return on the entrepreneur's project and thus the entrepreneur selects a below optimal effort level initially. A credit commitment with a lower fixed interest rate provides the entrepreneur an interest rate protection, which ensures that he puts in optimal (or at least more efficient) effort initially. Lenders break even in this model by receiving an upfront fee. Overall, the fixed rate credit commitment in Boot et al. (1987) serves as interest rate insurance.

Holmstrom and Tirole (1998) have a similar model, but in their model there is a liquidity shock in place of an interest rate shock. They use a dynamic entrepreneurial model of moral hazard in which the entrepreneur does not choose the optimal effort level unless he is given a minimum share in the project's final payoffs. In this set up, liquidity shocks could force the entrepreneur terminate

¹ Bates et al. (2009) show that cash-to-assets ratio of publicly traded US firms monotonically increased from 1980 to 2006. However, Lins et al. (2010) argue that the increase in cash is mainly due to operational needs and does not reflect increases in firms' liquidity reserves.

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