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Corporate precautionary savings: Evidence from the recent financial crisis

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ABSTRACT

This paper examines the effects of the recent financial crisis on corporate cash holdings and saving propensities. We find that on average, firms reduce their cash holdings in the first year of the crisis when the supply of external finance is tightened, and increase their holdings in cash from the third quarter of 2008 when the demand-side effects of the crisis are stronger. More importantly, we find that the positive cash flow sensitivities of cash are significantly stronger during the financial crisis. This effect is more pronounced in financially constrained firms and firms with a high precautionary motive. Our results suggest that firms tended to save more as a precautionary motive during the recent financial crisis.

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1. Introduction

A considerable amount of research has been devoted to corporate cash holdings and their saving propensities (e.g., Almeida, Campello, & Weisbach, 2004; Bates, Kahle, & Stulz, 2009; Han & Qiu, 2007; Opler, Pinkowitz, Stulz, & Williamson, 1999; Riddick & Whited, 2009; Zhang, 2005). Opler et al. (1999) point out that one of the benefits of holding liquid assets is to use them to finance activities and investments when other sources of funding are unavailable or too costly (precautionary motive). The precautionary motive for cash holdings predicts that firms hold cash as a buffer against adverse cash flow shocks. Consistent with this perspective, Opler et al. (1999) find that firms with risky cash flows and poor access to external capital hold more cash. Almeida et al. (2004) provide a model for the precautionary demand for cash and find that financially constrained firms invest cash out of their cash flows, whereas unconstrained firms do not. The most recent study, by Bates et al. (2009), finds that the precautionary motive for cash holdings plays

an important role in explaining the increase in cash ratio. In this paper, we provide further evidence of the precautionary motive by studying the effects of the crisis on corporate propensity to save cash out of cash flows.²

The ongoing financial/economic crisis that began in August 2007 has exposed the financial markets and the real economy to large exogenous shocks (Duchin, Ozbas, & Sensory, 2010). As shown in Fig. 1, the LIBOR-OIS spread increased suddenly in August 2007 and returned to its normal level in August 2009.³ The early period of the crisis represents an unexplored negative shock to the supply of external finance for corporations. Given the exogenous nature and the magnitude of the adverse cash flow shocks on the financial markets and the business environment, the recent financial

² Saving propensity and propensity to save cash out of cash flows are used interchangeably in the rest of the paper.

³ The London Interbank Offer Rate (LIBOR) is the rate at which banks are willing to lend to other banks for a specified term. The Overnight Indexed Swap (OIS) is the rate for a derivative contract on the overnight rate, or the Federal Reserve's Fed Funds rate in the U.S. The LIBOR-OIS spread, which is the difference between the London Interbank Offered Rate and the Overnight Indexed Swap Rate, is considered to be a measure of the health of the banking system. It has also been documented by a number of recent papers, such as Greenlaw et al. (2008) and Duchin et al. (2010).

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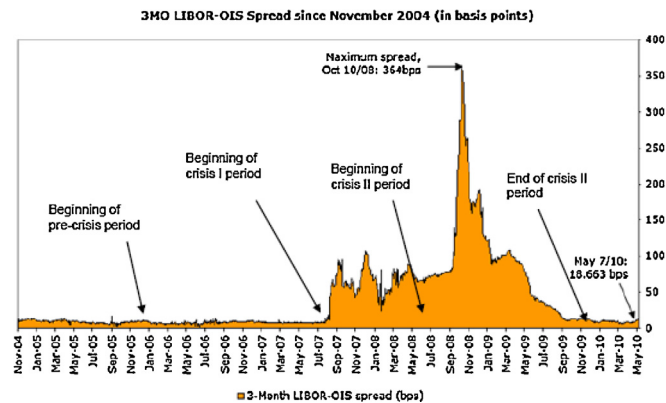


Fig. 1. LIBOR/OIS Spread from November 2004 to May 2010. The 3-month LIBOR-OIS spread from November 2004 to May 2010 in basis points. The data source is: <http://mdm.ca/news/2010/recent-stock-market-volatility.asp>.

crisis provides an excellent natural laboratory in which to examine whether the precautionary motive plays an important role in financial crises.

To empirically test the issue, we divide the sample into three periods shown in Fig. 1: *Pre-crisis* (July 2006–June 2007), *Crisis I* (July 2007–June 2008), and *Crisis II* (July 2008–June 2009). We isolate this second crisis period because the demand-side effects of the crisis strengthened in the later period. Using a difference-in-means approach to compare the quarterly change in cash across the three periods, we find that firms reduce their cash holdings by a significant 0.40% of book assets per quarter in *Crisis I* relative to *Pre-crisis*, and increase their cash holdings in *Crisis II* by 1.11% relative to *Crisis I* and 0.71% relative to *Pre-crisis*. Using firm fixed panel regressions, we find that for each dollar of additional cash flow, firms save around \$0.05 more cash in *Crisis I* relative to *Pre-crisis*. The difference in the saving propensities between *Crisis I* and *Pre-crisis* is significant at the 1% level. In *Crisis II*, firms save around \$0.06 more cash relative to *Crisis I* and about \$0.10 relative to *Pre-crisis* for each dollar of additional cash flow. This implies that firms save less during the first crisis period due to the severe liquidity supply shock and start to save more during the second crisis period due to the increase in liquidity demand. However, firms' saving propensities increase in both crisis periods.

The precautionary demand for cash predicts that the adverse cash flow shock should have greater effects on the saving behavior of financially constrained firms and firms with a higher precautionary savings motive (e.g., Almeida et al., 2004; McLean, 2011; Riddick & Whited, 2009). Almeida et al. (2004) find that for each dollar of additional cash flow, a constrained firm saves around \$0.05–\$0.06, whereas unconstrained firms do nothing. McLean (2011) finds that \$1 of issuance results in \$0.60 of cash savings over the most recent decade compared with \$0.23 during the 1970s, and points out that this increase is caused by an increase in the precautionary motive. We empirically test whether the precautionary savings demand for cash still holds during the current financial crisis. Following previous studies (e.g., Almeida et al., 2004; Fazzari, Hubbard, & Petersen, 1988; Hahn & Lee, 2009; Wang, 2002), we consider four measures of financial constraint: payout ratio, the Whited and Wu (2006) index, firm size, and the Kaplan and Zingales (1997) index at the end of the last fiscal quarter ending before July 2006, the beginning of our sample period. We find significantly positive cash flow sensitivity of cash in financially constrained firms during the crisis while insignificant cash flow sensitivity of cash in unconstrained firms. This suggests that constrained firms save more out of their cash flows during the crisis, where unconstrained firms do nothing. In light of the model of Almeida et al. (2004), our evidence of

the positive cash flow sensitivity of cash in financially constrained firms supports the precautionary motive.

Finally, using direct proxies for precautionary motive, we sort the sample into firms with high and low precautionary motives. We find that only firms with a high precautionary motive exhibit significantly stronger positive saving propensities, whereas firms with low precautionary motive do nothing during the financial crises. A set of robustness tests demonstrate that it is unlikely that our main results are either endogenously driven by the specification, measures, or mechanical factors. Overall, these results suggest that firms save more as a precaution during the financial crisis. This effect is more pronounced in constrained firms and firms with a high precautionary motive.

This paper contributes to the cash savings and precautionary savings motive literature (e.g., Almeida et al., 2004; Bates et al., 2009; Opler et al., 1999, etc.). These previous studies provide evidence that the precautionary motive for holding cash is excessively strong when asymmetric information or agency costs make it difficult for firms to raise capital from external sources. Our findings extend this literature by showing that the propensity to save out of cash flow during the financial crisis is higher, especially during *Crisis I* and for constrained firms or firms with a precautionary savings motive, because firms no longer have easy access to capital markets and have fewer growth opportunities and riskier cash flows. These results are consistent with the view that firms hold liquid assets to ensure that they can continue to invest when their cash flows are too low, relative to investment, and when outside funds are expensive.

Papers closely related to ours include Duchin et al. (2010), Ivashina and Scharfstein (2010), Bliss, Cheng, and Denis (2013), and Garcia-Appendini and Montoriol-Garriga (2013). All of these studies explore the change in cash reserves during the two crisis episodes, but do not explore cash flow sensitivities to cash. Duchin et al. (2010) examine the effect of the financial crisis on corporate investment and find that corporate investment declines especially for firms that have low cash reserves, although they touch on the issue of cash holdings. Ivashina and Scharfstein (2010) find that new lending (the supply of credit) declines substantially during the financial crisis across all types of loan. Different from our paper on cash saving propensities during the crisis period, Bliss et al. (2013) document significant reductions in both dividends and share repurchases during the 2008–2009 financial crisis and these reduction are more likely in firms more susceptible to the negative consequences of a credit supply shock such as firms with higher leverage, more valuable growth options, and lower cash balance. Garcia-Appendini and Montoriol-Garriga (2013) analyze how shocks to the banking sector and more broadly to financial markets affect the intra-firm provision of trade credit, which is considered an additional source of liquidity. We examine the change in cash holdings and saving propensities across financially constrained firms and firms with a precautionary savings motive and find a higher propensity for saving out of cash flow during the crisis.

The following section of the paper discusses the existing theoretical and empirical literature and develops the hypotheses. Section 3 introduces our data and our general empirical specification. Section 4 presents our results, and Section 5 concludes.

2. Literature review and hypotheses development

Firms have various motives to hold cash: (1) the agency motive, (2) the tax motive, (3) the fixed transaction cost motive, and (4) the precautionary savings motive (e.g., Almeida et al., 2004; Dittmar & Mahr-Smith, 2007; Foley, Fritz Hartzell, Titman, & Twite, 2007; Han & Qiu, 2007; Keynes, 1936; Opler et al., 1999). Over a longer

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