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How do banks respond to increased funding uncertainty? ☆

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ABSTRACT

The 2007–9 financial crisis began with increased uncertainty over funding conditions in money markets. We show that funding uncertainty can explain diverse elements of commercial banks' behavior during the crisis, including: (i) reductions in lending volumes, balance sheets, and profitability; (ii) more intense competition for retail deposits (including deposits turning into a “loss leader”); (iii) stronger lending cuts by more highly extended banks with a smaller deposit base; (iv) weaker pass-through from changes in the central bank's policy rate to market interest rates; and (v) a binding “zero lower bound” as well as a rationale for unconventional monetary policy.

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1. Introduction

The financial crisis began in August 2007 with an extended period of turmoil in money markets. Interbank rates such as Libor disconnected from central banks' policy rates and remained unusually high and volatile for an extended period (Taylor and Williams, 2009). Volumes of interbank lending, too, fell sharply and became more volatile (Afonso et al., 2011; Kuo et al., 2013). Both effects were

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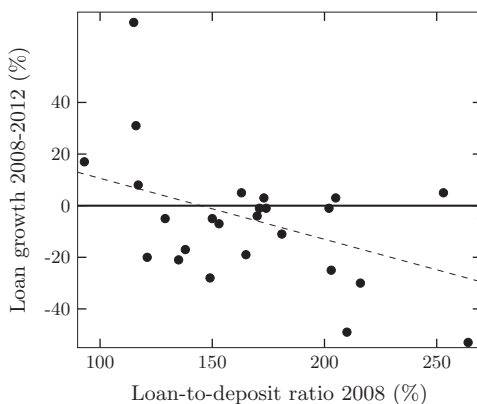


Fig. 1. Loan-to-deposit ratios and loan growth in European banking systems. Source: ECB (2013).

most pronounced for unsecured (i.e., uncollateralized) term loans between banks with maturities of 3 months or more. Similar effects were felt in wider wholesale funding markets, such as the markets for repos and commercial paper (Adrian and Shin, 2010). Commonly cited reasons for the turmoil are counterparty risk and an increased demand for liquidity (Acharya and Skeie, 2011).

Regarding the behavior of commercial banks during the crisis, there is significant evidence that customer lending in many countries declined (Campbell et al., 2010; Santos, 2010), and that banks became less profitable (Bank of England, 2008; ECB, 2013). Two important related effects have recently been documented. First, banks with better access to deposits have tended to cut lending by less (Cornett et al., 2011; Ivashina and Scharfstein, 2010; Iyer et al., 2013). Second, the ECB (2013) data summarized in Fig. 1 suggests that more extended banking systems, as measured by high loan-to-deposit ratios, experienced stronger drops in bank lending.

Central banks responded to the turmoil by aggressively cutting policy rates, moving close to the “zero lower bound” in many countries. Commentators expressed surprise at the apparently small impact that these rate cuts had on market interest rates. Moreover, central banks used unconventional tools such as asset purchases and quantitative easing in an effort to normalize money market conditions.

This paper develops a theory of the link between increased money market uncertainty, commercial bank behavior, and monetary policy which can explain and rationalize these empirical observations. We consider a partial-equilibrium model of a payoff-maximizing commercial bank. The bank extends retail loans and funds itself with retail deposits, equity capital, and via the money market.¹ The key feature is uncertainty over money market funding conditions.

We highlight two examples within our general setup. In the first, a risk-neutral bank faces uncertain aggregate liquidity in money markets where lenders are concerned about counterparty risk. This creates convex wholesale borrowing costs: Its (expected) wholesale funding rate increases in the amount borrowed, and also increases in the degree of liquidity uncertainty. In the second, the bank has finite tolerance for risk, (e.g., because of delegation to risk-averse managers), and faces stochastic money market rates. It can borrow any amount at a constant rate, but raising its interbank market exposure increases its risk-adjusted funding rate.

In line with the empirical findings, we show that a bank responds to higher funding uncertainty by lending less—together with a substitution effect by which it increases its use of deposit finance and raises additional equity capital from investors. Equilibrium market interest rates for loans and deposits both increase. Higher uncertainty also reduces bank profitability, measured, e.g., by return on

¹ Our main interest is in banks that are net borrowers in the wholesale market; this corresponds to loan-to-deposit ratios at least modestly above 100%. Fig. 1 shows that this condition applied to most European banking systems.

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