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Liquidity crisis, relationship lending and corporate finance

Michaël Dewally [a,1], Yingying Shao [b,c,*]

[a] Towson University, College of Business and Economics, 8000 York Road, Suite 316E, Baltimore, MD 21252, United States
[b] Towson University, College of Business and Economics, 8000 York Road, Suite 316F, Baltimore, MD 21252, United States
[c] Research Affiliate, University of Arkansas, Fayetteville, AR 72701, United States

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A B S T R A C T

This paper investigates the consequences of the liquidity shocks in wholesale funding markets during the 2007–2009 financial crisis on bank lending and corporate financing. We show that banks that relied more heavily on wholesale funding contracted lending more severely than banks that relied more on insured deposits. We then examine the effects of loan contraction on the financial positions of publicly traded firms. We find that both during and after the crisis, the change in leverage of bank-dependent firms is less than that of firms with access to public debt markets. In addition, bank-dependent firms rely more on cash than net equity issuance to finance operations. We also find that firms with established bank lending relationships weather the crisis better. Such firms are able to attain higher levels of leverage during the crisis, add to their cash holdings, secure new bank credit, and achieve higher profitability as a result.

1. Introduction

The 2007–2009 crisis occurred at a time when banks were exposed to high levels of liquidity risk (Afonso et al., 2011; Cornett et al., 2011). Since the early 1990s, competition from geographic deregulation and sharp increases in household leverage caused bank asset growth to outpace insured deposit growth so that many commercial banks relied increasingly on wholesale funding as alternative sources of financing.[2] Although wholesale funding expanded banks' funding base and potentially increased market discipline (Goodfriend and King, 1998; Calomiris, 1999), it also exposed them to sudden runs (Gorton and Metrick, 2012; Rajan, 2006; Huang and Ratnovski, 2011), which led to financial instability and sharp contractions in lending as banks fought for survival (Ivashina and Scharfstein, 2010).

The objective of this study is to examine how the 2007–2009 crisis, initiated by a liquidity dry-up in the short term wholesale funding markets, transferred into liquidity constraints for firms with heavy reliance on the availability of bank credit. In particular, we are interested in how corporate borrowers reacted after the virtual disappearance of liquidity as commercial bank credit became generally unavailable (Cornett et al., 2011). From corporate borrowers' perspective, not only did the liquidity crisis have a profound impact on the perception of the strength of capital markets but it also created uncertainty about the ease of future access to capital, which impinged the fiscal health of many corporations. In a survey of CEOs, Campello et al. (2010) find that the lack of liquidity creates fear and uncertainty, which result in reduced tech spending, employment, and capital spending. Firms also use available cash reserves, draw on lines of credit for fear that banks would restrict access in the future, and liquidate assets to fund ongoing operations. Moreover, firms alter their capital policies by stopping share repurchase programs, curtailing capital expenditures, curbing dividend payments, calling in all available liquidity before it disappears, and enacting other cash saving decisions (Kahle and Stulz, 2013).

The paper first examines the impact of the shocks in wholesale funding markets on the supply of bank credit during the 2007–2009 crisis. We conjecture that the liquidity shocks to the short-term wholesale funding markets impose liquidity constraints to banks, leading them to cut their lending and ultimately lead to changes in the capital structure of corporations. We then concentrate on the consequences of the shocks to loan supply on corporate borrowers. In particular, we examine the heterogeneity of firms' financial structure response to the impaired loan supply. The contraction of bank lending during the 2007–2009 crisis is an exogenous shock to corporate borrowers because the reduction in lending is caused by banks' liquidity constraints, not by concurrent changes in demand for credit. Moreover, the exogenous

* Corresponding author at: Towson University, College of Business and Economics, 8000 York Road, Suite 316F, Baltimore, MD 21252, United States. Tel.: +1 (410) 704 3839.

E-mail addresses: mdewally@towson.edu (M. Dewally), yshao@towson.edu (Y. Shao).

[1] Tel.: +1 (410) 704 4902.

[2] Typical wholesale funding includes commercial paper, repos, interbank loans, Federal Home Loan Bank advances, and large-denomination certificates of deposit.

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shocks are bank-specific rather than shocks to total credit supply which includes publically-traded and private debt.

The literature on bank lending has suggested the critical role of information production in loan processing and has related bank lending behavior to the transparency of borrowers. On the one hand, the theory of capital market segmentation argues that banks' advantages in information acquisition contribute to segmented capital markets where only banks are more willing to provide loans to small or less transparent firms compared to other creditors. This capital market segmentation theory implies that the adverse effect of contraction in loan supply will be more severe for bank-dependent firms that primarily rely on bank credit and lack access to public debt markets or private non-bank debt (Leary, 2009). On the other hand, the theory of relationship lending suggests that continuing relationships facilitates lenders' information acquisition hence should benefit borrowers with more credit availability and reduced lending costs (Boot and Thakor, 1994, Greenbaum et al., 1989, Ramakrishnan and Thakor, 1984). This benefit from relationships therefore should be able to offset the adverse effect of contractions in loan supply and make it less severe for firms with established lending relationships.

We surmise that the impaired credit supply affects firms differently depending on their reliance on bank credit and their relationships with bank lenders. The effects should be stronger for firms that primarily rely on bank credit and weaker for firms with established lending relationships. When faced with an impaired loan supply, bank-dependent firms will have to use internal funds or external equity to avoid capital constraints while firms with lending relationships may still benefit from access to external debt. The capital substitutions necessary for bank-dependent firms would lead to relatively lower leverage. On the contrary, firms with access to public debt market can easily substitute toward non-bank credit in response to reduced bank credit supply. Firms with established lending relationships would also not experience a constraint on leverage similar to that of bank-dependent firms.

In examining the impact of the shocks in wholesale funding markets on the supply of bank credit during the 2007–2009 crisis, we find that the use of wholesale funding exposes banks to liquidity shock, which adversely affects banks' lending. During the crisis, the sudden liquidity dry-ups in the wholesale funding markets lead to a larger reduction in lending for banks that rely heavily on wholesale funding, compared to banks with more retail deposits funding. Our findings are consistent with the study of Ivashina and Scharfstein (2010) that documents a smaller decline in lending in the syndicated loan markets from banks with more deposit financing than banks with less deposit financing during the crisis.

We document a significant difference in firms' financial structure response to the contraction of loan supply. First, we confirm that firms increase their leverage during the crisis. We also find that firms reliant on bank credit are not able to increase leverage as much as other firms during the crisis and that this situation persists in the post-crisis period. In contrast, firms with established lending relationships are able to increase leverage significantly more than firms without such relationships. We further document that this ability is directly related to a higher likelihood a receiving new loans during the crisis period, especially if the relationship was established with a prestigious lender.

In examining the consequences of the strength of the financing constraints across our bank-dependent and relationship samples, we find that bank-dependent firms use cash as a capital substitute to impaired loan supply and end up holding a significantly lower level of cash during and after the crisis. Meanwhile, firms with established lending relationships show increased cash holdings during and after the crisis, and are able to issue significantly more net equity compared to other firms. We follow up these results by documenting that firms with established lending relationships outperformed their peers both during and after the crisis, and that the source of this performance is these firms' continued access to bank capital.

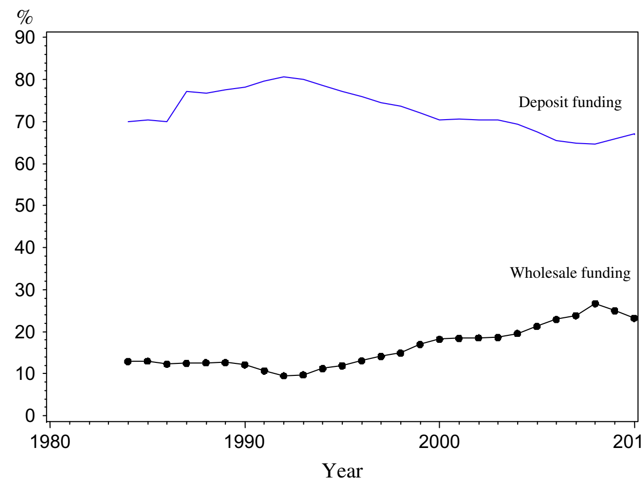

Fig. 1. Use of wholesale funding vs. retail deposit funds by US commercial banks. Data are from the Call reports. The solid line shows the average percentage of deposit funding in total assets. The dotted line shows the average percentage of wholesale funding in total assets.

Our study contributes to two strands of literature: the literature on the funding strategy of banks and the literature on the determinants of firms' financial policy. First, while a number of studies have studied the implications of wholesale funding strategy to banks' risk and stability, few studies have empirically investigated the effects in the real sector. This study provides additional evidence that the fluctuations in wholesale funding market can spread to the real sector through its impact on credit supply. Second, our study complements the studies on capital market segmentation and relationship lending by illustrating how differently shocks to bank credit supply can affect firms' financial structure, depending on their relationship with banks. In spite of the large volume of existing studies on the 2007–2009 crisis, our study is only one of few to link the shocks in wholesale funding markets to corporate financial structure.

The reminder of the paper is organized as follows. Section 2 provides background on the wholesale funding activities among U.S. banks and develops the empirical hypotheses. Section 3 discusses empirical methodology and Section 4 describes the data. Section 5 presents the results and Section 6 concludes.

2. Shocks to wholesale funding, bank lending, and impact on capital structure

Banks have been increasingly using wholesale funding as an alternative funding source for decades. Fig. 1 presents the increasing reliance of banks on wholesale funding from 1984 to 2010, using the data from the regulatory Report of Condition and Income data ("Call report") of nearly the entire universe of U.S. commercial banks.[3] The chart shows that banks' use of wholesale funding, measured as the mean ratio of non-core funding to total assets, has started to increase in the early 1990s due to deregulation and changes in the yield curve and deposit markets (Becker, 2007) and has been gradually increasing until the recent 2007–2009 crisis, when the liquidity shocks in the short-term funding markets lead to a significant drop in the use of wholesale funding. Correspondingly, the use of core deposits, measured as the mean ratio between total core deposits and total assets, has been continuously decreasing over the years.

[3] Though some data exist back to 1976, the reporting standards do not stabilize until 1984.