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Bank loans for private and public firms in a liquidity crunch

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ABSTRACT

Bank reliance on short-term funding has increased over time. While an effective source of financing in good times, the 2007 financial crisis has exposed the vulnerability of banks and ultimately firms to such a liability structure. We show that banks dependent on wholesale funding contracted their lending the greatest during the crisis. Our results suggest, however, that in the financial crisis vulnerable banks passed the liquidity shock only to public firms and not to private firms. Loans to private firms were affected through a different channel, largely through higher retained shares by lead arrangers. Consistent with standard models of financial intermediation with information asymmetry, vulnerable banks increased their monitoring of informationally opaque firms for which the potential for informational rents is the highest.

1. Introduction

The 2007 financial crisis intensified the debate on bank lending behavior. Substantial write-downs in 2008 by U.S. banks raised questions of whether lending would continue at impaired banks. While the theoretical literature provides a framework in which shocks to banks' financial conditions can affect the performance of their borrowers, and hence the real economy (Bernanke and Blinder, 1988), empirical studies face a challenge in tracing the channels through which these shocks affect the supply of credit. The question arises as to whether the decrease in lending due to a common shock is driven by the ability of banks to supply credit or the willingness of borrowers to demand credit. In addition, do credit cuts driven by banks affect different types of borrowers in the same way? What is the role of information asymmetry about the quality of borrowers and lenders in times of crises?

In this paper we use matched bank-firm panel data to isolate what appears to be a shift in loan supply across banks from a shift in loan demand across firms. We investigate loan origination of Canadian banks that faced an exogenous adverse shock in short-term wholesale funding markets, emanating from the United States. The hypotheses we take to the data are based on standard models of financial intermediation under information asymmetry. Consistent with panic-based bank run models, a decline in the supply of uninsured wholesale funding can result in a reduction in the supply of credit, holding all else equal. The recent financial crisis revealed the instability of wholesale borrowing as a source of bank funding; funding that evaporated quickly in times of uncertainty and exposed well-capitalized profitable banks to a liquidity crunch.[1]

Further, we hypothesize that the lending cut by vulnerable banks are not passed equally across corporate borrowers. Banks, as information monopolists, are found to extract higher returns in downturns when the cost of information asymmetry is highest (see (Santos and Winton, 2008)). Therefore, if banks have to cut back on new lending, they would do less so to private firms than to public firms as the former are more informationally opaque and the potential returns are higher.

Finally, we analyze the impact of a liquidity shock on lead arrangers' loan shares. The retained share of the lead arranger in a syndicate may increase, consistent with securing information rents and/or due to concerns about syndicate moral hazard (Bharath

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[1] Huang and Ratnovski (2011) in a theoretical model show that with a noisy public signal (e.g., signals such as market prices and credit ratings), wholesale financiers who are uninformed about bank-specific fundamentals can choose to liquidate a bank based solely on a negative but possibly very imprecise public signal.

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et al., 2011; Sufi, 2007). Lenders in the syndicate may force wholesale funding dependent lead arrangers to retain higher loan shares in order to commit them into monitoring borrowers' quality despite their exposure to the shock.

Canadian banks are a well-suited laboratory to analyze whether banks that relied more on wholesale funding prior to the crisis changed their lending behavior during the crisis. Canadian financial institutions were in good health and had robust corporate balance sheets (Ratnovski and Huang, 2009). Furthermore, the Canadian banking system has historically been less reliant on wholesale funding than the U.S. system, suggesting that it should have been less vulnerable to a liquidity shock in the short-term wholesale funding market. Notably, Canadian banks emerged as "world class lenders" post-crisis.[2] If Canadian banks curtailed lending during the crisis, it would not have been because of their write-downs but because of a US-transmitted liquidity shock.

We rely on data from the Canadian syndicated loan market during the period 1990–2009 complemented with bank and firm balance sheet characteristics. We employ a difference-in-differences approach in which we compare the loan amounts for public and private firms before and after the onset of the crisis for banks with different pre-crisis exposures to wholesale funding, controlling for loan, bank, and firm characteristics. To control for time-invariant variation in loans across firms and banks we include bank and firm fixed effects. Consistent with our interest in supply effects, our analysis focuses on the early period of the crisis in order to avoid demand-side effects documented post-2008.

We observe that newly issued syndicated loans in Canada started to fall in 2007:Q3. Total syndicated lending dropped from \$192 billion in 2007 to \$142 and \$91 billion in 2008 and 2009, perspectively. In addition, wholesale funding of Canadian banks decreased during the crisis – the ratio of repo funding to total funding dropped from 12.4% pre-crisis to 8.7% post-crisis. Similarly, bank and non-bank deposits that comprise the majority of wholesale funding dropped from 42.3% pre-crisis to 38.4% during the crisis. This paper links the decline in lending and wholesale funding through a supply side effect.

The importance of banks being exposed to wholesale funding on loan reduction is significant. An increase in pre-crisis wholesale funding from the 25th to the 75th percentile is associated with an 11% drop in loan amounts for public firms in the crisis period (2007–2008). Loan amounts to private firms, however, are not sensitive to banks' pre-crisis exposure to wholesale funding, suggesting that banks choose to pass the funding shock only to public firms.

Using the early stage of the crisis our findings are consistent with supply effects. Our results, however, could also be due to lower demand for credit. Although a decline in credit demand can explain the overall drop in lending during the crisis, it is more challenging to explain the negative relationship between wholesale funding and lending to public firms during the crisis. A plausible explanation is that this pattern is due to non-random sorting between banks with high pre-crisis reliance on wholesale funding and firms with stronger decreases in demand for loans during the crisis. If the demand for loan financing fell more during the crisis for these firms, our findings would be the result of a shock to demand rather than to supply.

We conduct cross-sectional analysis based on industry-level measures of dependence on external finance, which are commonly argued to be exogenous to individual firms (Rajan and Zingales, 1998). We find that the relationship between loans and wholesale funding during the crisis holds for the group of firms whose demand for external financing was not likely affected, enforcing our interpretation of a causal supply effect. We complement this analysis with a test in which we exclude the oil and gas industry given that it is strongly export-oriented and hence the most vulnerable to a U.S. economic downturn. The results confirm that when we exclude this industry from the analysis, the relationship between loan amount and wholesale funding remains qualitatively similar. Finally, we explore the possibility that Canadian public firms substitute loans with bond financing during the crisis. Although we find a strong negative correlation between bonds and loans in the period 2010–2014, the link between bonds and loans is non-existent over our sample period.

Next, we find compelling evidence that lead arrangers' pre-crisis wholesale funding exposures affect their relative retained shares for certain loans. Lead arrangers exposed to the shock through high reliance on wholesale funding may increase their share in opaque loans to private firms to extract informational rents in times of crisis or to mitigate asymmetric information problems related to elevated syndicate or borrower moral hazard. We find that lead arrangers that relied on wholesale funding increased their retained shares in the loan during the crisis by nearly 7%. However, lead arrangers did not increase their share in loans to public firms, providing support to our hypothesis that lead banks are likely driven by stronger asymmetric information problems and possible informational rent extraction in private firms during the crisis.[3]

Our paper is related to the recent literature on credit supply during the financial crisis. Ivashina and Scharfstein (2010a), Gozzi and Goetz (2010) find that U.S. banks with greater exposure to short-term funding cut syndicated lending more aggressively than banks that relied on insured deposits. Cornett et al. (2011) confirm the above result and also add that loan growth is positively correlated with growth in liquid assets, which reduces banks' capacity to provide new loans. Acharya and Mora (2015) find that banks exposed to the liquidity shock through draw-downs of commitments and credit lines have lower loan growth despite scrambling for deposits by raising rates. Our paper extends this literature in several ways. First, we confirm the previously stated results in the literature that higher pre-crisis reliance on wholesale funding leads to banks cutting back on new origination. Using Canadian data allows us to understand how a liquidity crisis can be transmitted through the dry-up (or its perception) of an apparently integrated wholesale funding market to a banking system that was in sound financial condition. This result highlights the severity of liquidity dry-ups.

Second, we show that the crisis did not affect all borrowers in the same way. Vulnerable banks chose to decrease lending to public firms only, while there was no change for private firms. Our results confirm theories on information asymmetry – banks choose to decrease lending to public borrowers which have alternative access to funding and will not incur as high information rents to banks as private borrowers. These heterogeneous lending cuts can have implications for the policy design of liquidity lending facilities during times of stress.

[2] The Financial Times (14 September, 2010) reports that: "the five biggest banks – Royal Bank of Canada, Toronto-Dominion, Bank of Nova Scotia, Canadian Imperial Bank of Commerce and Bank of Montreal – have survived the crisis in better shape than most of their US and European counterparts. None required any direct injection of capital from taxpayers, and all maintained their dividends. Royal and TD are among a handful of banks around the world that still carry a Moody's triple A credit rating. Their capital buffers remain well above regulatory thresholds, with tier one capital ratios ranging from 11.7% at Scotiabank to 14.2% at CIBC."

[3] This is also consistent with Houston and James (1996) who document how public firms with many lenders are less prone to a hold-up problem than public firms with few lenders.