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The impact of Treasury supply on financial sector lending and stability ☆

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ABSTRACT

We present a theory in which the key driver of short-term debt issued by the financial sector is the portfolio demand for safe and liquid assets by the nonfinancial sector. This demand drives a premium on safe and liquid assets that the financial sector exploits by owning risky and illiquid assets and writing safe and liquid claims against them. The central prediction of the theory is that safe and liquid government debt should crowd out financial sector lending financed by short-term debt. We verify this prediction with US data from 1875 to 2014. We take a series of approaches to rule out standard crowding out via real interest rates and to address potential endogeneity concerns.

1. Introduction

The financial sector holds long-term risky and illiquid assets that are predominantly funded by short-term debt. Based on data from 1875 to 2014, we report that on average the ratio of financial sector short-term debt to gross domestic product (GDP) is 0.58. Financing from long-term debt and equity funding is small, averaging 0.08 relative to GDP. These funds are used mainly to fund long-term investments that average 0.52 relative to GDP, with

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the remainder invested in Treasury bonds, reserves, and currency. Theoretical models show that this funding structure is fragile and associated with financial crises (Diamond and Dybvig, 1983). Empirical work has shown that high bank credit growth, which is largely funded by short-term debt, increases the likelihood of a financial crisis (Schularick and Taylor, 2012).[1]

Why does short-term debt fund so much of bank lending? The theoretical literature offers several distinct (but not mutually exclusive) explanations. The agency view of short-term debt, modeled in Calomiris and Kahn (1991) and Diamond and Rajan (2000), is that short-term debt serves as a device to ensure that bank management takes efficient actions, i.e., actions that maximize bank value. A second view of short-term debt highlights the insurance offered by the government on deposit financing. In this view, articulated prominently by Admati and Hellwig (2013), banks issue short-term debt to take advantage of mispriced deposit insurance and implicit bailout guarantees. A third view of short-term debt emphasizes the special role of banks in creating liquidity. In this view, modeled in Diamond and Dybvig (1983), Gorton and Pennacchi (1990), and Dang, Gorton, and Holmstrom (2009), the financial intermediary sector plays an important role in transforming illiquid long-term assets into liquid short-term liabilities that offer non-pecuniary services to the nonfinancial sector. This paper provides evidence in favor of this third view of banking and short-term debt. We show that investors have a large demand for safe and liquid investments and that short-term bank debt satisfies this demand. Investors' demand translates into low yields on short-term debt that is safe and liquid. The financial sector supplies such debt by holding positions in other assets (loans, securities, etc.) that are funded by short-term debt.

To arrive at these results, we exploit variation in the supply of government securities. In Krishnamurthy and Vissing-Jorgensen (2012), we show that Treasury securities are money-like in several respects. We establish this by showing that reductions in the supply of Treasuries lower the yield on Treasuries relative to corporate securities that are less liquid and more risky than Treasuries. This is true even controlling for the default component of the corporate securities. That is, Treasury securities carry a moneyness premium, and this premium is declining in the total supply of Treasuries. If financial sector short-term debt is due to demand for safety and liquidity, then Treasury supply should crowd out financial sector short-term debt via effects on the equilibrium prices of safety and liquidity.

Section 2 presents a simple model of banking, in which banks own loans and securities and fund these with equity and short-term bank debt. The key assumption of the model is that short-term bank debt and Treasury securities offer non-pecuniary services to households, so that the yield on these assets are lower than that of loans. The theory predicts that increases in Treasury supply will crowd out financial sector lending funded by short-term debt. This is because the reduction in the yield spreads between risky and illiquid loans and safe and liquid assets brought about by an increase in Treasury supply makes it less profitable for banks to take in deposits to invest in riskier, less liquid loans. Prior theoretical work, in particular by Holmstrom and Tirole (1998, 2011), also draws the connection between the government supply of liquid securities and the private supply of such securities. Holmstrom and Tirole (2011) show that when a shortage exists of government supplied liquid assets, a liquidity premium arises which induces the private sector to invest in projects that generate liquid assets.

To test this prediction, we construct the aggregate balance sheet of the US financial sector and the supply of US government securities from 1875 to 2014. We define government supply as the supply of unbacked Treasury issues plus metal-backed Treasury supply, minus foreign official holdings of Treasury securities. By unbacked Treasury bonds we refer to Treasury securities (of all maturities) plus Treasury-issued currency (which accounts for the pre-Federal Reserve period, when the Treasury issued currency), and by metal-backed supply we mean Treasury issues of gold and silver coins and gold and silver certificates. We subtract foreign official holdings of government securities from this sum as we are interested in the privately held supply of US government issues. We study the relation between government supply and the US financial sector's net supply of short-term debt. The latter is the total of all short-term debt issued by the financial sector net of the financial sector's holdings of government securities and short-term assets. This net short-term debt measure by construction equals the amount of long-term lending to the private (i.e., nongovernment) sector financed by short-term debt. We show that the financial sector's net short-term debt supply (relative to GDP) is strongly negatively correlated with the government supply (relative to GDP). This result, together with the result in Krishnamurthy and Vissing-Jorgensen (2012) on the impact of Treasury supply on yield spreads between risky and illiquid assets and Treasuries (representing safe and liquid assets), suggests that financial sector short-term debt is special in the same way that government-supplied securities are and that the financial sector issues short-term debt in part to satisfy the special demand for safe and liquid debt. The picture that emerges from the data is that of a financial sector that is active in transforming risky and illiquid loans into liquid and low-risk liabilities, profiting from the spread between these securities.

An obvious concern with our crowding-out result (the negative relation between financial sector net short-term debt and government supply) is that it might not be driven by safety and liquidity effects but instead by the standard mechanism taught in macroeconomics textbooks in which government supply crowds out private capital formation by raising real interest rates. We show that this is unlikely by including measures of the real interest rate and the capital stock in our regressions and demonstrating that the crowding-out of net short-term debt by government supply is robust to including these control variables. Moreover, our model of safety and liquidity-induced crowding-out has the unique prediction that the ratio of bank

[1] These ideas linking credit and debt to financial crises go back at least to Fisher (1933).