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Liquid-claim production, risk management, and bank capital structure: Why high leverage is optimal for banks ☆

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ABSTRACT

Liquidity production is a central function of banks. High leverage is optimal for banks in a model that has just enough frictions for banks to have a meaningful role in liquid-claim production. The model has a market premium for (socially valuable) safe/liquid debt, but no taxes or other traditional motives to lever up. Because only safe debt commands a liquidity premium, banks with risky assets use risk management to maximize their capacity to include such debt in the capital structure. The model can explain why banks have higher leverage than most operating firms, why risk management is central to banks' operating policies, why bank leverage increased over the last 150 years or so, and why leverage limits for regulated banks impede their ability to compete with unregulated shadow banks.

1. Introduction

Banks maintain capital structures with leverage ratios that are much higher than those of virtually all operating firms that are not in financial distress. Many economists accordingly see high bank leverage as puzzling from a positive-theory viewpoint and as normatively troubling. These reactions arise from viewing bank capital structure through the lens of Modigliani and Miller (1958, MM) augmented by consideration of moral hazard, taxes, and other leverage-related distortions. The MM debt-equity neutrality principle states that, absent frictions and holding operating policy fixed, all capital structures yield identical value. When leverage-related distortions are added to the debt-equity neutrality baseline, the resultant capital structure model has no efficiency-based motive that can explain why banks generally maintain leverage ratios that are so much higher than those of operating firms.

This capital structure model also implies there would be no social costs if regulators mandated severe reductions in bank leverage. Admati and Hellwig (2013) make this point forcefully with an argument that builds on Miller (1995), Pfleiderer (2010), and Admati, DeMarzo, Hellwig, and Pfleiderer (2011). As Myerson (2014, p. 200) notes, the

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MM leverage irrelevance theorem is the foundation of the argument. With debt-equity neutrality as the baseline and only leverage-related distortions given meaningful weight, Admati and Hellwig (2013, p. 191) conclude: "[I]ncreasing equity requirements from 3 percent to 25 percent of banks' total assets would involve only a reshuffling of financial claims in the economy to create a better and safer financial system. There would be no cost to society whatsoever." They also argue that the far lower leverage of virtually all operating firms – especially firms such as Apple that have little or no debt – calls into question the existence of benefits to debt that could justify high bank leverage. Cochrane endorses this view of bank capital structure and notes that the argument favors increasing bank equity requirements to 50% or even 100% of assets (see Wall Street Journal, 2013).[1]

In the MM baseline view, there is no connection between bank leverage and what banks do. Banks are treated as firms that make loans, and they make the same loans irrespective of their debt-equity mix. Importantly, with its central principle that capital structure is irrelevant, this view leaves no room for a connection between bank leverage and the value that banks generate as producers of liquid financial claims. The idea that liquidity production is intrinsic to banking is discussed extensively by, among others, Diamond and Dybvig (1983), Diamond and Rajan (2001), Gorton (2010), Gorton and Pennacchi (1990), and Holmström and Tirole (1998, 2011). If banks' credit-screening technology enables them to make better loans than competitors could and all other MM assumptions hold, banks could adopt all-equity capital structures with no loss in value. However, if banks generate and capture value by producing financial claims to meet the demand for liquidity, those with high-equity capital structures are not competitive with otherwise comparable banks or bank substitutes that have less equity.

In this paper, we show that high leverage is optimal in a model of bank capital structure that has just enough frictions so that banks have a socially valuable role in supplying liquid claims (safe debt) to parties with imperfect access to capital markets. The model excludes taxes, moral hazard and other agency problems, deposit insurance, reaching-for-yield behavior, return-on-equity-based compensation plans, and all other distortionary motives to lever up. We exclude these factors to establish that high bank leverage arises naturally in the absence of distortions in an idealized world in which intermediation is focused on the production of socially valuable liquid claims.

Our stripped-to-the-basics model of banking has three key assumptions: (1) inclusion of an exogenous demand for liquid claims in the spirit of Diamond and Dybvig (1983) and the other pioneering studies referenced above, (2) the existence of costs of intermediation that are a function of bank scale, and (3) the ability of banks to engage in asset-side risk management that involves hedging in a perfect/complete capital market, exactly as in models that yield the MM theorem.

Together, (1) and (2) imply that a liquidity premium – a rate-of-return discount – on safe/liquid debt can obtain because scale-related costs of banking preclude the unfettered arbitrage that would make intermediation irrelevant. The existence of a liquidity premium is a common assumption in models of intermediation, and the available evidence supports this approach. In our model, a premium obtains under some, but not all, conditions. In the most basic case in which banks do not earn a spread on loans, a liquidity premium must obtain so that banks can cover the costs of intermediation. If banks earn a spread on loans and if liquid-claim demand is small relative to the efficient size of the banking sector, then liquidity does not command a premium. In this case, the loan spread covers the costs of intermediation. Although the leverage of any one bank is irrelevant, aggregate bank debt must be large enough to service the aggregate demand for liquid claims. Finally, if liquid-claim demand is sufficiently strong and bank scale is determinate, liquidity is priced at a premium and high leverage is optimal for individual banks and for banks in the aggregate.

Condition (3) is implicitly present in many prior analyses of bank capital structure. It is a previously unrecognized asset-side implication of models that apply the MM theorem to the liability side of bank balance sheets. When market prices embed a liquidity premium, banks in our model generate value by exploiting the hedging opportunities made possible by (3) to construct asset portfolios that support large amounts of safe/liquid debt issued to parties with imperfect access to capital markets.

When a liquidity premium exists, bank capital structure matters: Equity and safe/liquid debt are not equally attractive sources of capital. As Gorton and Pennacchi (1990) emphasize, debt has a strict advantage when it has the informational insensitivity property – immediacy, safety, and ease of valuation – desired by those seeking liquidity. In our model, this liquid-claim property applies only to perfectly safe deposit debt, but the reasoning of Gorton and Pennacchi implies that liquidity benefits can also be priced into relatively safe non-deposit debt, e.g., repos and commercial paper. In any case, our model's emphasis on deposit debt seems reasonable because, as Stein (2014, p. 4) indicates, "banks are almost always and everywhere largely deposit financed." More concretely, as Hanson, Shleifer, Stein, and Vishny (2014) report, deposits averaged 80% of total assets at US commercial banks over 1896–2012.

Capital structure is a sideshow for value creation at operating firms, but it is the star of the show at banks in our model. The risky asset structures of most operating firms are poorly suited to support large-scale issuance of safe/liquid debt. In our model, banks exist because specialization and the associated cost efficiencies give them a comparative advantage over operating firms in arranging asset structures to support large amounts of safe debt and/or in contracting with parties that are willing to pay a premium for safe/liquid claims because they have impaired access to capital markets.

[1] This view has strong support among many other prominent economists. For example, in Financial Times (2010), 17 other well-known economists agree that, with much more equity funding, banks could perform all their socially useful functions and support growth without endangering the financial system. See also Myerson (2014) and Wolf's endorsement of this general view in Financial Times (2013).