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Capital Structure in Banking

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Capital structure theories seek to explain why businesses choose different mixes of debt and equity to finance their operations. Banking firms represent a special case because of certain unique features in the industry, including a federal safety net and extensive regulation. The financial crisis of the past two years provided another set of special circumstances in which banks needed to raise capital. The preference banks have shown for issuing preferred shares in the private market in favor of government financing can be viewed through the lenses of capital structure theories.

The issue of capital has been fundamental for U.S. banks over the past two years, a period marked by the worst financial crisis since the Great Depression. Bank capital has been under severe stress as a result of massive write-downs of bad assets and losses on real-estate-related lending. Many banks have sought to rebuild capital by raising money in the private markets. At the same time, the federal government has directly injected preferred equity into banks. This *Economic Letter* examines the applicability of capital structure theory to the capital-raising efforts of U.S. banks.

Standard capital structure theory in corporate finance

A seminal paper by Modigliani and Miller (1958) shows that, in perfect capital markets, financing does not matter because the value of the firm is independent of how equity and debt claims are structured. The paper provides powerful insights into the separation of investment and financing decisions. With perfect capital markets, what happens on the left side of the balance sheet that determines firm value is independent of the financing on the right side of the balance sheet. In practice, however, capital markets are imperfect and financing clearly does matter. With these imperfections, or financial frictions, the value of a firm can increase or decrease depending on its financing mix. In principle, a firm will seek to adjust its capital structure to maximize its value.

This *Letter* examines three theories that seek to explain how financial frictions affect capital structure: tradeoff theory, pecking order theory, and free cash flow theory.

Tradeoff theory. Tradeoff theory looks at how businesses balance the pros and cons of different forms of financing. For example, when the tax code allows interest payments to be deductible expenses in computing corporate income tax, a taxpaying corporation that pays an extra dollar of interest receives a

partially offsetting “interest tax shield” in the form of lower taxes paid. Thus, financing with debt instead of equity increases the total after-tax return to investors and therefore increases corporate value, implying that companies should maximize debt financing over equity. However, too much debt raises the probability of financial distress. Tradeoff theory says that firms will borrow to the point that the marginal value of the tax shield equals the expected marginal cost of financial distress, implying moderate debt ratios for nonfinancial businesses.

Pecking order theory. Pecking order theory emphasizes the information asymmetry between managers and outside investors. A company that issues equity may signal that it has positive net-present-value projects, meaning that capital raised by issuing stock can be invested in projects that exceed the company’s hurdle rate of return. But the market may read stock issuance as a signal that the company is overvalued and its share price too high. This leads to an equilibrium in which a company can issue shares, but only at a marked-down price. Thus, companies whose assets are undervalued at the marked-down share price may choose not to issue equity, even if it means giving up potentially profitable projects. By contrast, debt, which is senior to equity, is less exposed to errors in firm valuation, minimizing the information advantage of managers. With debt, bondholders are less concerned about the level of profitability of the borrower, focusing instead on whether the company’s cash flow will be adequate to service its debt obligations. Pecking order theory says that businesses prefer internal capital to external financing. But if external financing is needed, businesses will issue the least risky securities, that is, securities least likely to be marked down by investors because of information asymmetry, working down from senior debt to junior debt, to convertible securities or preferred stock, and finally to equity. Under this theory, a firm’s debt ratio reflects its total requirement for external financing.

Free cash flow theory. Jensen’s (1986) free cash flow theory models the agency cost between firm managers and investors. With agency costs, firm managers are assumed to have incentives to maximize their own welfare at the expense of owners. The problem is how to motivate managers to disgorge cash rather than spending it in ways that benefit them, but don’t meet hurdle rates of return, such as buying corporate jets or expensive office furnishings. The answer can be debt, which forces companies to pay out cash. Thus, while a high debt ratio can raise the possibility of financial distress, it can also add value by inhibiting managers from making unprofitable investments.

Theories of capital in banking

Banks and other depository institutions are specialized businesses whose capital structures are affected by a number of conditions unique to the banking industry, such as government regulation and access to a federal safety net that includes deposit insurance and borrowing through the Federal Reserve discount window. Deposit insurance was created to contain the rapid withdrawals from a bank whose financial condition may be in doubt. As Diamond and Dybvig (1983) point out, deposit contracts that provide liquidity, that is, contracts that permit depositors to withdraw funds on demand, are subject to bank runs. Such runs are especially dangerous for banks that rely on liquid deposits to finance highly illiquid bank loans. With government deposit insurance, depositors have no incentive for a run. Another tool to mitigate bank runs is for the central bank to act as lender of last resort.

Merton (1977) models deposit insurance as a put option, which offers banks the right to put their assets to the deposit insurer at strike prices equal to the face value of the deposits. According to option pricing theory, the value of deposit insurance rises with the asset risk and the strike price. Thus, an insured bank may have incentive to maximize the value of its deposit insurance by taking more risks and employing less capital. Some observers see this moral hazard as an argument in favor of strong bank supervision and capital regulation. If a government safety net lowers the expected cost of financial distress for banks, then, according to tradeoff theory, they would tend to leverage more than nonbanks. Capital regulation may be needed to force them to hold more capital.

Other banking researchers focus on the unique functions of banks, such as credit extension and liquidity creation. According to Diamond and Rajan (2000), a bank's capital structure could affect these functions. Banks create liquidity by offering demand deposits. Since increased uncertainty can subject deposits to rapid withdrawals, outside capital can play a role by reducing deposit volatility and improving a bank's ability to survive. But, by definition, a higher capital level means a reduced need for deposits and hence less liquidity creation.

Capital structure theories can help explain the choices banks made on raising capital during the financial crisis. Under the pecking order theory, when banks have private information about their assets, they would choose to issue debt before equity to minimize the undervaluation problem. But, during the financial crisis, banks needed to raise equity to replenish depleted capital. At that time though, the information asymmetry regarding bank asset portfolios was so severe that equity could generally be issued only at a substantial discount. In that environment, issuing preferred stock may have been a reasonable strategy because it avoided diluting common equity while restoring the balance of equity and debt financing and meeting regulatory capital requirements. Issuing new common equity at a discount would have transferred wealth from existing to new shareholders. And, issuing new debt would have increased the probability of default, with the associated risk of losing control rights. Unlike debt service payments, preferred stock dividends can be suspended without triggering bankruptcy.

Because preferred stock claims are junior to debt claims, investors would demand a higher rate of return. In order to lower dividends, banks could issue convertible preferred stock, which gives holders the right to convert preferred shares into common stock at a prespecified price. In effect, the issuing firm is giving the preferred stockholders a call option on the firm's common stock in return for a lower dividend rate. Before the Treasury Department announced the Capital Purchase Program (CPP) in October 2008, several financial institutions raised capital by issuing preferred or convertible preferred stock.

Government capital programs

Under the voluntary CPP, the Treasury Department agreed to purchase up to \$250 billion in bank perpetual senior preferred shares. These nonvoting shares qualify as Tier 1 capital and pay a cumulative dividend of 5% for the first five years and 9% thereafter. The government also received warrants to purchase issuing-bank common stock totaling 15% of the preferred investment at an exercise price equal to the market price of the bank's common stock at the time of preferred issuance. The banks must also comply with executive compensation regulations. A total of \$134 billion of CPP capital was still invested in banks as of the end of October 2009.

In February, the Treasury Department inaugurated the Capital Assistance Program (CAP) for the banking companies that were found to need additional capital as a result of stress tests administered to 19 large bank holding companies under the Supervisory Capital Assessment Program (SCAP). Ten of the SCAP banks were found to need additional capital to withstand a worse-than-expected economic scenario. However, nine of the ten banking companies were able to raise sufficient capital by issuing common equity and selling assets instead of tapping CAP funding. (The one exception, GMAC, is expected to meet its capital requirement by accessing the Troubled Asset Relief Program's Automotive Industry Financing Program.) Although issuing common equity may seem inconsistent with the pecking order theory, the highly publicized SCAP process may have reduced the information asymmetry between managers and potential investors.

Both CPP and CAP are government programs in which pricing and terms are not shaped by market forces. The standardized terms of these programs do little to differentiate the true cost of capital among the issuers. Moreover, the executive compensation limitations are only possible because of government enforcement. It is difficult to determine the extent to which the CPP program was actually voluntary. Several SCAP banks have redeemed CPP funds after raising private capital, suggesting that these

institutions prefer private to public capital. On the other hand, many smaller banks that do not have access to the capital market, voluntarily chose to apply for CPP capital.

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