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Do subordinated debt holders discipline bank risk-taking? Evidence from risk management decisions

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ABSTRACT

I test the market discipline of bank risk hypothesis by examining whether banks choose risk management policies that account for the risk preferences of subordinated debt holders. Using around 500,000 quarterly observations on the population of U.S. insured commercial banks over the 1995–2009 period, I document that the ratio of subordinated debt affects bank risk management decisions consistent with the market discipline hypothesis only when subordinated debt is held by the parent holding company. In particular, the subordinated debt ratio increases the likelihood and the extent of interest rate derivatives use for risk management purposes at bank holding company (BHC)-affiliated banks, where subordinated debt holders have a better access to information needed for monitoring and control rights provided by equity ownership. At non-affiliated banks, a higher subordinated debt ratio leads to risk management decisions consistent with moral hazard behavior. The analysis also shows that the too-big-to-fail protection prevents market discipline even at BHC-affiliated banks.

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1. Introduction

Market discipline refers to a mechanism through which the holders of uninsured bank claims, such as subordinated debt holders and uninsured depositors, can prevent banks from adopting a moral hazard behavior.¹ Before the break out of the financial

crisis, market discipline had been considered over a decade as a necessary complement to government bank regulation and supervision aiming at achieving the objective of safety and soundness of the banking system (Meyer, 1999). Several studies suggest that banks become mandated to issue subordinated debt on a regular basis in order to enhance the effectiveness of market discipline (e.g., Evanoff et al., 2007; Niu, 2008). The recent financial crisis has, however, battered the belief in the effectiveness of markets to discipline bank risk, as many voices pointed to the failure of market mechanisms in preventing banks from taking excessive risks.

While the charming power of market discipline has faded away in favor of more government regulation of banks, some areas of market discipline deserve further investigation before a final verdict on its effectiveness can be made. In particular, the capability of market participants to influence bank risk choices – market influence – has not received due attention in the banking literature. Though, Bliss and Flannery (2002) and Ashcraft (2008) are exceptions. Their results lead nevertheless to conflicting

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¹ Market discipline has two distinct components: market monitoring and market influence (Bliss and Flannery, 2002). Market monitoring refers to the hypothesis that investors are able to detect changes in a bank's risk condition and incorporate them into security prices. Market influence refers to the ability of investors and regulators to change the risk-taking behavior of banks. Empirical research was directed mostly towards investigating the ability of market participants to accurately assess the financial condition of banks and bank holding companies – market monitoring. Investors' ability to detect higher risk banks and to require higher yield spreads on subordinated bonds was examined in empirical settings where yield spread levels are regressed on accounting and market risk measures. The results of studies based on recent periods data most often point to the existence of an effective monitoring by subordinated debt holders (Flannery and Sorescu, 1996; Morgan and Stiroh, 2001; Jagtiani et al., 2002; Sironi, 2003; Covitz et al., 2004; Goyal, 2005). In contrast, earlier studies using data through the end of the eighties failed to find a significant association between subordinated debt yield spreads and bank risk (e.g., Avery et al., 1988; Gorton and Santomero, 1990). The explicit too-big-to-fail policy pursued until the beginning of the 1990s is seen as a factor that prevented bondholders' from

monitoring bank risk effectively. The effect of the too-big-to-fail policy on bondholders' incentives is supposed to have attenuated after the passage of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) in 1991.

conclusions. Bliss and Flannery (2002) find no evidence that following a change in yield spreads, managers respond with changes in balance sheet allocations, and conclude that markets do not influence bank risk-taking behavior. Ashcraft (2008) examines the effect of the presence of subordinated debt in a bank's capital structure on its behavior. Specifically, he investigates the effect of subordinated debt on a bank's probability of financial distress and failure in the future. His findings point to the existence of a disciplinary role of subordinated debt holders as long as they can impose real constraints on bank behavior.

In addition, while the lack of market discipline has been pointed out as one of the main reasons for the excessive risks taken by banks in the pre-crisis years, others argue that market participants cannot be effective in curbing banks' excessive risk-taking in the presence of implicit guarantees, such as the too-big-to-fail guarantee.² Specifically, the creditors of systemically important banks lack the incentives to effectively monitor risk-taking since they believe that the government cannot let their institutions fail. The current debate on reforming bank regulation puts a special emphasis on too-big-to-fail banks. One of the arguments put forward is that too-big-to-fail banks are immune to market discipline.³ It is therefore of interest to examine whether the disciplinary role of market participants such as subordinated debt holders is hindered at too-big-to-fail banks.

This paper contributes to the bank market discipline literature by investigating whether the presence of subordinated debt among liabilities influences a bank's risk management decisions, while accounting for the potential effect of the too-big-to-fail protection. To my knowledge, this is the first study that tests for bank market discipline through the channel of risk management. The study builds upon the idea that if subordinated debt holders' preferences are accounted for in the risk choices of banks, this should be reflected in banks' risk management decisions. Given their pay-off structure, subordinated debt holders are interested in keeping the bank's default risk at low levels. Therefore, if they are effective in assessing a bank's risk of default and in incorporating it in its security prices, they will impose higher funding costs on banks operating with a higher risk of default. Subordinated debt holders can also discipline banks operating with a high default risk by imposing more restrictive covenants and by refusing to roll over debt in the future.

One way for bank managers and owners to avoid the costs associated with a high risk of default is to hedge the bank's risks.⁴ The corporate risk management literature suggests that one of the motives that induce corporations to hedge is the reduction of their expected bankruptcy costs (Smith and Stulz, 1985; Mayers and Smith, 1982).⁵ Hedging reduces the variability of cash flow and firm value and, therefore, lowers the expected costs of bankruptcy.

² The too-big-to-fail policy is illustrated by the government measures taken in the wake of the panic that shook financial markets after the collapse of Lehman Brothers in September 2008. At that time, Governments promised to prevent the failure of any systemically important financial institution. The promises were followed by a financial support for the major banks.

³ The other argument is that the too-big-to-fail guarantee may be unaffordable by governments as they do not necessarily have sufficient resources to back failing banks.

⁴ A bank operating with a higher default risk imposes higher costs to its shareholders, as it is more likely to violate its debt covenants or miss coupon and/or principal payments. These violations cause costs since they can trigger financial penalties, accelerated debt repayment, the refusal to roll over debt by investors, and less flexibility in selecting its investment and financing strategies. Another source of cost comes from the likelihood of foregoing positive NPV investments because of the high costs of external funds of firms in financial distress (Froot et al., 1993).

⁵ Other motives for hedging by corporations suggested in the finance literature include the convexity of tax codes (Smith and Stulz, 1985), avoiding the costs associated with underinvestment (Froot et al., 1993), increasing the debt capacity (Leland,

Stulz (1996) suggests that companies should hedge their risk so that financial distress is made highly unlikely. Purnanandam (2008) shows theoretically and empirically that firms facing higher costs in the event of financial distress have more hedging incentives. Purnanandam (2007) finds that banks facing a higher likelihood of financial distress manage their interest rate risk more. Risk management is therefore one of the tools used by banks willing to reduce their risk of default. A bank's incentives to reduce its risk of default are higher in the presence of subordinated debt holders willing and capable of imposing higher costs on institutions operating with a high default risk. Thus, the presence of subordinated debt can potentially induce bank managers and owners to hedge more their risks in order to keep a bank's risk of default and the related costs at low levels.

Whether the presence of subordinated debt does in fact matter for the risk management decisions of banks is an empirical issue that I address in this paper. I examine how banks that have (more) subordinated debt among their liabilities hedge their interest rate risk using derivatives compared to those that have no (or less) subordinated debt. Specifically, I use a regression analysis where a bank's likelihood or extent of interest rate derivatives use for risk management purposes is regressed on its ratio of subordinated debt to total liabilities. In order to account for the potential endogeneity of the subordinated debt ratio, I conduct the analysis in a two-stage framework. In the first-stage estimation, the subordinated debt ratio is determined by a set of variables, including instruments selected carefully. In the second stage regression, the risk management model is estimated using the predicted value of the subordinated debt ratio as the main explanatory variable. The analysis also accounts explicitly for the potential effect of the too-big-to-fail protection on the relation between the subordinated debt ratio and risk management decisions. I include two control variables to capture the potential effect of the too-big-to-fail protection: a dummy variable for large banks (TBTF) and an interaction variable between TBTF and the predicted subordinated ratio. I conduct the analysis on quarterly observations on the population of FDIC-insured commercial banks over the 1995–2009 (quarter 2) period, or around 500,000 observations.

I focus on interest rate derivatives for two main reasons. First, interest rate risk is one of the most important sources of bank risk. Banks face a high degree of interest rate risk due to the maturity mismatch between their assets and liabilities. Flannery and James (1984) document that the market returns of bank stocks are sensitive to the maturity gap between assets and liabilities. Second, Diamond's (1984) model suggests that banks acting as delegated monitors should take only risks where they have a monitoring comparative advantage. Only those risks are a source of profit for banks. Since monitoring cannot influence the level of interest rates, bearing interest rate risk only increases a bank's likelihood of default without generating any incentive benefits.⁶ Thus, it is optimal for banks attempting to reduce their default risk to remove interest rate risk through the use of derivatives.⁷

1998; Graham and Rogers, 2002), and managerial risk aversion (Smith and Stulz, 1985; Tufano, 1996).

⁶ Brewer et al. (2000) test Diamond's (1984) theoretical prediction and find results suggesting that interest rate derivatives allow commercial banks to lessen their systematic exposures to changes in interest rate rates, thereby enhancing their ability to perform their intermediation function more effectively. It is, however, worth noticing that some banks, especially those attempting to improve their financial performance by altering their business mix and moving away from traditional lending activities, speculate on interest rate changes to generate revenues.

⁷ Several studies suggest that interest rate derivatives are the largest used type of derivatives by banks. As of year-end 1996, Sinkey and Carter (2000) find that 65.6% of all derivatives contracts reported by U.S. insured banks are interest rate

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