

Can subordinated debt constrain banks' risk taking?

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Abstract

This paper presents a model in which requiring banks to issue a proper amount of subordinated debt can constrain their risk taking both before and after debt issuance. The main idea is that the prospect of issuing debt motivates banks to invest in safe assets before debt issuance; holding such assets then constrains their risk taking after debt issuance. The model helps understand the existing empirical findings, and offers a new testable prediction. It also suggests that: (1) regulators should set the amount of subordinated debt within a range; and (2) subordinated debt cannot entirely substitute for equity capital.

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1. Introduction

Many economists believe that requiring banks to issue some amount of subordinated debt can constrain their risk taking. The idea seems intuitive: if creditors charge riskier banks a higher interest rate, banks would think twice before taking excessive risk. This idea is referred to as direct market discipline.¹

Empirical studies, however, seem to have produced conflicting findings. Some researchers examine cross-sectional data. They find that creditors indeed charge riskier banks a higher interest rate, and conclude that subordinated debt can constrain banks' risk taking (see, e.g., Covitz et al., 2004; Morgan and Stiroh, 2001 and Sironi, 2003). Others look at time-series data. They find no change of the banks' risk-taking behavior before and after debt issuances (see

Krishnan et al., 2005).² When does risk reduction occur, then, if subordinated debt can constrain banks' risk taking?

To answer this question, we propose a theoretical model. The model studies how a bank chooses between two types of assets: safe or risky. A safe asset has a higher expected return, but a risky asset provides a higher return when it succeeds. The bank first chooses an asset to invest its existing funds. It then raises some new funds by issuing insured deposits and subordinated debt. After that the bank chooses another asset to invest its new funds. At the time of debt issuance creditors can observe which type of asset the bank has already invested in, but they cannot contract on the bank's future asset choice. The bank pays a flat-rate deposit insurance premium, and defaults when both of its assets fail.

We show that there exists a range of the amount of subordinated debt such that below this range, the bank invests

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¹ When the market prices of bank debts help regulators and other private creditors detect risky banks, subordinated debt constrains the banks' risk taking indirectly. This idea is referred to as indirect market discipline. See Flannery (2001) for an excellent discussion on the various aspects of market discipline.

² Several researchers attempt to directly measure the effect of subordinated debt on banks' risk-taking behavior. The findings are mixed. Bliss and Flannery (2000) find that bond price changes do not reliably influence subsequent bank behavior. Ashcraft (2006) documents that the presence of subordinated debt has a positive effect on the future outcomes of distressed banks.

in two risky assets. This is because a flat-rate deposit insurance scheme provides an incentive for the bank to take excessive risk.

Interestingly, when the amount of subordinated debt is within this range, the bank invests in two safe assets. In other words, subordinated debt constrains the bank's risk taking both before and after debt issuance. The intuition is as follows. Because the creditors cannot charge the bank an interest rate based on its future asset choice, they have to anticipate it. They do so by observing which type of asset the bank has already invested in. A bank holding a safe asset has a higher opportunity cost of taking risk, and hence is more likely to invest in another safe asset after debt issuance. Accordingly, the creditors charge such a bank a low interest rate. This provides the bank with an incentive to invest in a safe asset before debt issuance; holding such an asset motivates the bank to invest in another safe asset after debt issuance.

When the amount of subordinated debt is above this range, the bank again invests in two risky assets. This is because when the amount of debt is too large, even a bank holding a safe asset will invest in a risky asset after debt issuance, because doing so would reduce its expected cost of debt. But at the time of debt issuance rational creditors can anticipate the bank's future asset choice, and charge it a high interest rate. Anticipating this, the bank invests in a risky asset even before debt issuance.

The above analysis suggests that when subordinated debt constrains banks' risk taking, researchers are expected to document three findings. First, banks reduce their risk before they issue debt. Second, creditors charge riskier banks a higher interest rate. And third, banks do not change their risk-taking behavior after they have issued debt. Our model thus suggests that the existing empirical findings are consistent with the idea that subordinated debt can constrain banks' risk taking. It also suggests that future research needs to examine whether banks reduce their risk before they issue debt.

There have been a number of proposals calling for increased use of subordinated debt;³ our model supports these proposals. It further suggests that regulators should set the amount of subordinated debt within a range. In the paper we discuss how the bounds of this range depend on a number of factors. In addition, our model suggests that subordinated debt cannot entirely substitute for equity capital to constrain banks' risk taking.

Our paper is most closely related to Blum (2002). Blum raises an important question: how can a bank credibly commit to choosing a given level of risk after debt issuance? He shows that if the bank cannot commit, then requiring it to issue subordinated debt would aggravate its risk-taking incentives. We propose that the bank can use its existing safe asset as a commitment device.

Our paper is also related to Calomiris and Kahn (1991), Flannery (1994) and Niinimäki (2001). These papers explain how short-term debt can discipline banks. Their rationale is that by giving creditors the right to withdraw their funds at any time, banks are deterred from taking excessive risk. Our paper explains how long-term debt can also discipline banks.⁴

Boot and Schmeits (2000) show that the potential benefits of conglomeration depend on the effectiveness of market discipline. Our paper complements their results by showing that a proper amount of subordinated debt can improve market discipline.

In a continuous-time setting, Decamps et al. (2004) and Rochet (2004) show that subordinated debt can constrain banks' risk taking. They focus on examining the optimal mix of the three pillars of the New Basel Accord. By contrast, our paper helps understand the existing empirical findings and offers a new testable prediction. Our paper also explains why the amount of subordinated debt should be set within a range, and why subordinated debt cannot entirely substitute for equity capital.

The paper proceeds as follows. Section 2 presents the baseline model. Section 3 examines the bank's asset choices. Section 4 checks the robustness of the results, and Section 5 discusses policy implications. Section 6 concludes.

2. The baseline model

2.1. The sequence of events

We consider a representative bank (a banking entrepreneur) that operates in a risk-neutral economy. The risk-free interest rate is normalized to zero. There is a bank regulator in this economy.

The bank can invest in two types of assets: safe or risky. Either type of asset requires an initial investment of \$1. A safe asset yields a return of R_S when it succeeds, and 0 when it fails. The probability of failure is θ_S . A risky asset yields a return of R_R when it succeeds, and 0 when it fails. The probability of failure is θ_R . We assume that

$$\begin{aligned} 0 < \theta_S < \theta_R < 1, \\ 1 < R_S < R_R, \\ 0 < \Delta \equiv (1 - \theta_S)R_S - (1 - \theta_R)R_R, \end{aligned}$$

i.e., neither type of asset is riskless, a risky asset provides a higher return when it succeeds, but a safe asset has a higher expected return.

There are four dates: 0, 1, 2, and 3. At date 0, the bank is endowed with $k \in [0, 1]$ amount of equity capital, and $(1 - k)$ amount of deposits. All the deposits are insured by the government.⁵ We assume that the insurance

⁴ Subordinated debts are usually issued with initial terms to maturity in excess of 10 years (see BCBS, 2003 and Board and Treasury, 2000).

⁵ See Blum (2002) for an analysis of the impact of deposit insurance in a similar model.

³ See BCBS (2003) or Board and Treasury (2000) for a comprehensive review of these proposals.

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