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THERE SHOULD BE NO CAP ON THE AMOUNT OF SUBORDINATED DEBT: WILLIAM POOLE IS RIGHT!

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Abstract

Market discipline in the context of regulatory supervision of banks could be achieved by mandating banks to issue a minimum amount of subordinated debt to the public. Recent studies, however, argue that increased levels of subordinated debt may lead to increased risk-taking by banks, thus undermining the disciplinary function of such debt instruments. These studies, then, call for imposing an upper limit on the amount of subordinated debt that can be held. So, should there be such an upper limit? This paper lays out and analyzes a model that addresses this question. The analysis reveals that subordinated debt as an instrument of market discipline is only useful under relatively large amounts of debt. This finding furnishes theoretical support for a recent proposal by William Poole (former chief executive of the Federal Reserve Bank of St. Louis) on how subordinated debt can be made to serve as a 'disciplinary device.'

Key words

Subordinated Debt; Market Discipline; Bank Supervision; Risk Exposure

INTRODUCTION

In the context of regulatory supervision of banks, the Basel Accord II, established in 2001 emphasizes three major pillars: minimum capital requirements; regulatory supervisory review; and rules for disclosure (market/investor discipline). The disclosure-pillar stresses the need for banks to more frequently divulge information regarding their risk exposure and capital adequacy to investors in order to foster transparency and better market discipline. As such, it is recommended that larger banks issue subordinated debt, which has a lower priority claim than the more senior debt on bank assets. This incentivizes creditors to more closely monitor the risk-exposure of banks. Thus, the incentives of subordinated debt holders and the incentives of regulators become aligned. This rationale for mandating banks to issue a minimum amount of debt has found voice in what is a large chorus of researchers

(Benston et al, 1986; Shadow Financial Regulatory Committee, 2000; Evanoff & Wall, 2000; Lang & Robertson, 2002).

The above-described rationale has, however, been recently questioned. For instance, the tendency of bank managers to disclose favorable information as well as the tendency of the government to bail out troubled larger banks ("too big to fail") may distort the information content of subordinated bond prices and hamper the supervisory role of such debt. In addition, it is argued that subordinated creditors, unlike unsecured depositors, may gain significantly under favorable conditions (that is, on the upside of risk).This makes increased risk-taking by banks a desirable condition for subordinated debt holders. As a result, the incentives of creditors and those of regulators are thrown out of sync. In fact, Gorton and Santomero (1990) and Bigus and Prigge (2005) find evidence that subordinated bond prices rise with the level of bank risk. Therefore, they maintain that it may be worthwhile for regulators to impose a limit on the amount of subordinated debt issued by banks (in addition to requiring the issue of a minimum amount of subordinated debt). It is worth noting here than Niu (2008) theoretically establishes an upper limit that is not "too large."

So, should there be such an upper limit? This paper analyzes a standard-type, simple model (Brigus & Prigge, 2005) that captures the connections between the size of subordinated debt and risk-taking by bank to address this question. The analysis reveals that subordinated debt as an instrument of market discipline is only useful under relatively large amounts of debt. This finding, lends theoretical legs to Poole's (Moore, 2009) recent proposal requiring banks to hold at least 10% of their liabilities in the form of subordinated debt (with no cap on this debt), which has been argued to be a rather large proportion (Roblaragh, 2009).

The rest of the paper is organized as follows: Section 2 lays out the Model and conducts a careful examination of the links between the size of subordinated debt and risk–taking by banks. Section 3 concludes the paper.

A MODEL AND AN ANALYSIS OF SUBORDINATED DEBT AND BANK RISK

Bigus and Prigge (2005) – henceforth, B&G - compute the default risk of subordinated debt when the bank has low risk, DR_{Sub}^{s} , and when the bank is taking higher risk, DR_{Sub}^{r}, by drawing in standard-fashion on two cumulative asymmetric positively skewed density functions; G_s (for safe) and G_r (for risky), as depicted in Fig.1.

If the difference in default risk (DR_{Sub}^{s} - DR_{Sub}^{r}) is positive then subordinated debt holders benefit from risk taking by the bank.

$$DR_{Sub}^{r} - DR_{Sub}^{s} = \int_{D_{Dep}}^{D_{Dep}+D_{Sub}} [G_r(z) - G_s(z)]\, dz = \int_{\underline{v}}^{D_{Dep}+D_{Sub}} [G_r(z) - G_s(z)]\, dz - \int_{\underline{v}}^{D_{Dep}} [G_r(z) - G_s(z)]\, dz \quad (1)$$

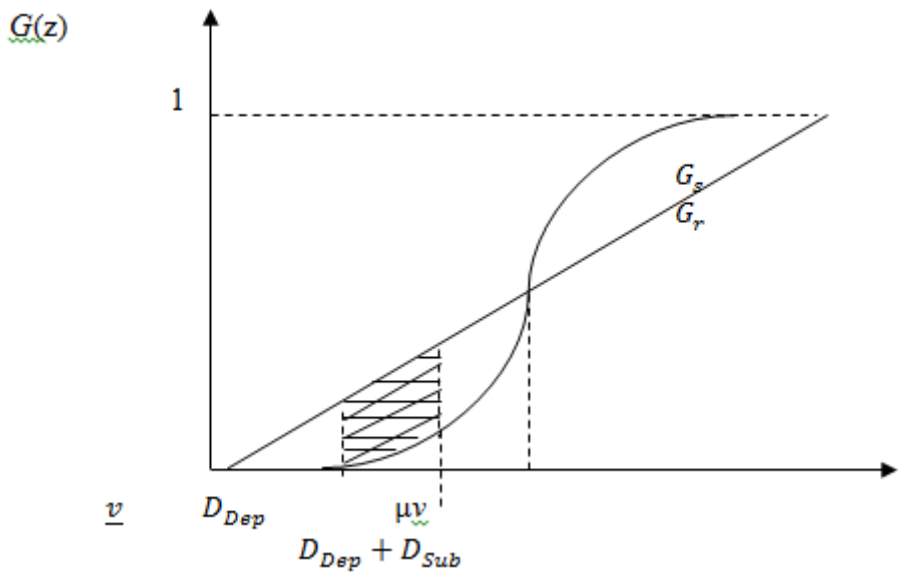

FIG 1. HIGH RISK (G_r) VS LOW RISK (G_s) CUMULATIVE ASYMMETRIC DENSITY FUNCTIONS

Where $\underline{v}$ is the lower bound of the bank's asset value$v$, while D_{Dep} and D_{Sub} represent the claim on the bank assets by depositors and subordinated debt-holders respectively. To estimate the above default risk difference, B&G construct two discrete, positively skewed density functions representing bank asset values under the two different scenarios; when bank risk is low and when it is relatively high.

TABLE 1. DISCRETE ASYMMETRIC DENSITY FUNCTIONS (LOW AND HIGH RISK)

Value of Bank assets	$v-2d$	$v-d$	v	$v+d$
Pr. of Asset Value (low risk)	p_1	p_2	p_3	p_4
Pr. of Asset Value (high risk)	p_1+2p^*	p_2-3p^*	p_3	p_4+p^*

p^* represents the degree of higher risk compared to the low risk density function while d is the standard deviation of bank asset values representing the risk level.

The degree of increased risk is represented by the probability value p^*while d is the standard deviation of the bank's asset values, representing the general risk level. Here, two different cases are considered: Case 1 where deposits are small and Case 2 where deposits are large. In Case 1, where the following condition holds:

$$v-2d < D_{Dep} \leq v-d \tag{2}$$

the difference in default risk is estimated as follows:

$$DR^s_{Sub} - DR^r_{Sub} = -2p^* D_{Sub} + 3p^*[D_{Sub} + D_{Dep} - (v-d)] \tag{3}$$

when $D_{Dep} \leq v - d < D_{Dep} + D_{Sub} \leq v$

It is argued that this default risk difference could be positive (there are benefits to debt-holders if the bank takes more risk) in case the following three conditions are met:

$$D_{Sub} > 3\left(v - d - D_{Dep}\right)$$

$$D_{Dep} > v - d - \frac{D_{Sub}}{3}$$

$$d > v - D_{Dep} - \frac{D_{Sub}}{3}$$

(4)

The above conditions imply that if deposits, subordinated debt, and the bank's risk are "large enough", then debt-holders may have risk incentives. However, in what follows, we show that the above statement is not correct and there seem to be no benefits to debt-holders (from increased risk-taking by the bank) under this Case 1, where deposits are small.

The above three conditions are interchangeable so we will focus on the first one. Consider the bank's asset value $v = D_{Dep} + D_{Sub} + E$ where E stands for stockholders equity. Therefore, replacing $v - D_{Dep}$ with $D_{Sub} + E$ in the above condition yields the following:

$$D_{Sub} > 3\left(v - d - D_{Dep}\right) > 3(D_{Sub} + E - d)$$

(5)

Therefore, the default risk difference could be positive only if:

$$D_{Sub} < \frac{3}{2}(d - E)$$

(6)

This condition may not hold in most cases. Given the recent emphasis that bank regulators have placed on capital adequacy requirements under Basel I and II, shareholders' equity E is likely to be large enough to absorb any possible loss resulting from increased risk d. Also, given that ample stockholders' equity is established, there is a lot at stake for shareholders (in terms of potential losses), leading bank-managers to take on less risk. Given that the expression on the right-hand side of (6) is negative, the only scenario where debt holders may benefit from risk taking is when $D_{Sub}$is negative, which of course is not plausible. Therefore, the difference in default risk (DR^{s}_{Sub} - DR^{r}_{Sub}) is unlikely to be positive under Case 1 (small amount of deposits). Hence, we contend that subordinated bond prices (and yields) do offer accurate signals to regulators under this condition; while bank-managers may have the incentive to increase risk in order to defray some of the increased cost of subordinated debt, debt holders may resist such an attempt leading to lower bond prices as the bank's risk rises. Therefore, the capital adequacy

requirements stipulated by the Basel accord, though costly, yield additional, important benefits.

Now, we turn to the discussion of Case 2 offered by B&G, where the amount of deposits is large, that is, when the following condition holds:

$$v - d < D_{Dep} \leq v \tag{7}$$

Here the difference in default risk is computed as follows:

$$DR^{s}_{Sub} - DR^{r}_{Sub} = p^{*}D_{Sub} \tag{8}$$

The difference is positive, suggesting that benefits exist for bond holders under conditions of increased risk. In this case, as the bank's risk increases, bond prices (and yields) rise (fall). This in turn, gives distorted information to regulators on the financial condition of the bank. Therefore, we contend that the use of subordinated debt as an instrument of market discipline is useful only under relatively large amounts of debt, which is supportive of Poole's proposal mentioned earlier. This implies having no cap on the amount of subordinated, which runs counter to the received wisdom.

CONCLUDING REMARKS

This paper analyzes a simple, standard-type model for capturing the relationship between the size of subordinated debt and risk-taking by banks, as in Bigus and Prigge (2005), and argues that the possible increase in a bank's risk as a result of subordinated debt issuance may be associated with conflicting incentives of bank-managers and creditors. That is, when small amounts of subordinated debt are issued, the increased cost of debt may not be significant enough to encourage bank managers to invest in riskier assets in order to defray this incremental cost. However, under this condition, since risk incentives do exist for subordinated debt holders, bond prices (and yields) may be higher (lower) when the bank's risk increases, giving distorted information to regulators.

On the other hand, when large amounts of subordinated debt are issued, the analysis uncovers that subordinated debt holders would not benefit from increased risk. As a result, subordinated bond prices (and yields) would still offer accurate signals to regulators on the financial condition of the bank. Therefore, the use of subordinated debt as an instrument of market discipline may only be useful under relatively large amounts of debt, implying that there, in fact, ought not to be a ceiling on the size of a bank's subordinated debt.

The discussion thus far has focused on the size dimension of subordinated debt, in terms of its implications for risk-taking on the part of banks. One avenue for future work is to examine the interest-rates dimension, in terms of the effectiveness of capping interest rates on subordinated debt.

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