Jeremy C. Stein

Commentary

In his very interesting paper, Jean-Charles Rochet argues that instead of spending so much time on refining Pillar 1 (risk-based capital), the Basel Committee should seriously think about Pillars 2 (supervisory action) and 3 (market discipline). I certainly agree with the broad theme of Rochet's paper, which I would interpret as saying that one can get too lost in the details of implementing risk-based capital standards and that it is useful to step back and ask, what fundamental economic problem are we trying to solve, and how can we best deploy all the tools at our disposal together? These tools include not only capital requirements, but also market-based information as well as supervision and early intervention.

Rather than going through the details of Rochet's model, I will try to illustrate some of his ideas using an alternative—and much homelier—model. My model is also designed to highlight one critical variable not emphasized in Rochet's analysis, namely, the cost to banks of holding equity capital. I want to demonstrate that the cost of bank equity has an important impact on how one thinks about the optimality of using other policy tools, such as risk-based (as opposed to flat) capital requirements. I also want to suggest that, in addition to focusing on the three pillars, policymakers might want to devote more attention to thinking about ways to reduce the cost of equity for banks.

The model proceeds as follows. Imagine that bank *i* can invest in a loan of type *i* at time 0. With a probability 1/2, the loan yields a gross return of $(1 + v_i) + 2R_i$ at time 2, and with a probability 1/2, the loan yields $(1 - v_i)$ at time 2. Thus, the loan has an expected return of R_i, and a "volatility" of v_i. Let $R_i = bv_i$, so that riskier loans have higher expected returns to the bank that makes them.

As an alternative to bank lending, the loan can also be made in the bond market, where the market discount rate is zero. However, in this case, the time-2 payoff on the loan is only $(1 + v_i)$ in good state, instead of $(1 + v_i) - 2R_i$. In other words, bond market borrowing is always zero net present value, while the bank can create an expected surplus of R_i by virtue of its monitoring efforts. Note that since $R_i = bv_i$, the relative appeal of bank lending compared with bond market lending is greater for riskier borrowers—one can think of these borrowers as firms for whom monitoring is most valuable.

To create a role for capital regulation, I assume that there are externalities associated with banks getting into trouble. A simple way to do so is to assume that bank managers do not attach any private costs to bank defaults, but that each bank default has a social cost of *X*. Finally, I assume that banks have two ways of raising funds. They can borrow, in which case they have to offer their investors an expected return of zero. Alternatively, they can finance themselves with equity, but equity has a cost of *k*. For the time being, this added cost represents an unspecified deviation from the Modigliani-Miller capital structure irrelevance benchmark; I will discuss its

Jeremy C. Stein is a professor of economics at Harvard University and a research associate at the National Bureau of Economic Research.

possible origins shortly. And as will become clear momentarily, it is precisely this cost of bank equity that makes the regulatory problem a nontrivial one.

Let us first ask what happens in a world with no regulation of any sort. Absent regulation, every bank holds zero equity capital—that is, debt finance is strictly preferred because it is viewed as cheaper—and makes all loans. The good news in this scenario is that all gains from intermediation are realized. The bad news is that society bears an expected default cost of $X/2$ per loan.

Now consider some possible regulatory approaches. First, one might try a regime of "flat," or non-risk-based, capital requirements. This corresponds to forcing banks to hold some fixed amount of equity v against all loans, irrespective of their risk. The benefit of this approach is that it eliminates the possibility of default for the less risky loans, those for which $v_i < v$. The downside, however, is that the bank's cost of capital for all loans is now vk. This results in disintermediation—loans leaving the banking sector for the bond market—and hence a loss of the monitoring-related surplus if $R_i = bv_i < vk$. In other words, flat capital requirements distort cross-sectional pricing and discourage banks from making safe loans where they might otherwise create value.

These types of problems make clear the appeal of risk-based capital requirements. In this context, risk-based requirements amount to forcing a bank to hold v_i against loan type i. The obvious advantage is that this eliminates all defaults, and can do so with less distortion of pricing and hence less disintermediation because the capital charge for low-risk loans can be reduced. At the same time, going from flat to risk-based capital requirements is not without its costs. As Rochet emphasizes, these costs arise from the real-world complexities associated with implementing a risk-based system, along with its potential vulnerabilities to lobbying and political pressure.

Taking these political-economy considerations into account, which regime—flat or risk-based—is better? Observe that the answer will depend crucially on the cost of bank equity k. For high values of k, the distortions in loan pricing associated with a flat-capital regime are severe, so it is better to go with risk-based capital despite the political-economy costs. In contrast, for low values of k, it makes sense to stick with the simpler and less politically vulnerable flat-capital requirement.[1]

Said a bit differently, the complex risk-based capital approach envisioned in the Basel II proposals can make sense only if one believes that k is relatively high—that is, that there is a significant violation of the Modigliani-Miller conditions that makes bank equity costly. This observation leads to two questions. First, what are the primitive frictions that make bank equity so expensive? And second, are there any steps that policymakers can take to help reduce the cost of bank equity, thereby mitigating the distortions associated with capital regulation?

With respect to the first question, it is easy enough to enumerate the usual suspects that are thought to make equity finance more expensive than debt finance: 1) tax disadvantages; 2) free-cash-flow-type agency problems, whereby investors discount the value of a bank when management has too much slack and might be tempted to make bad investments; 3) asymmetric information, which can make raising new equity difficult; and 4) market inefficiencies, which can lead to (real or perceived) transient undervaluations, and again discourage new equity issues.

Of course, it is harder to get a good handle on the relative importance of each of these frictions for banks. But this may be a very useful area for further study because if we had a better understanding of exactly why bank equity is thought to be so costly, we might be able to take steps to bring the cost down. And again, with a lower cost of bank equity, capital regulation can be made more efficient, and potentially simpler.

Let me offer a couple of examples. First, and most directly, if it is the case that taxes play an important role in pushing up the cost of bank equity, it follows that one might want to increase scope for tax-favored instruments to count toward capital requirements. I will not try to get into the specifics of how this could be implemented, but it is worth noting that the tax angle provides an alternative motivation—distinct from market discipline—for the types of subordinated debt proposals that Rochet discusses.

My second example is motivated by the free-cash-flow agency problem. If the primitive friction is that investors do not like a bank having a lot of capital just sitting around on the balance sheet, why not employ some sort of *conditional capital arrangement* that only channels the equity to the bank in those states where it is needed to avert default? Specifically, suppose a bank has 100 in loans today; these loans will be worth either 90 or 110 next period, with a probability 1/2 of either outcome. One way for the bank to avoid default would be to finance itself with 90 of debt and 10 of equity. But this approach leaves the bank with 20 of free cash in the good state. If investors worry that this excess slack in good times will lead to waste, they will discount the bank's stock.

An alternative—in the spirit of a recent proposal by Mark Flannery—would be for the bank to raise 90 in debt, 5 in equity, and 5 with a "reverse convertible debenture." The reverse convertible would be structured as follows. It would have a face value of 10, and in the good state, it would remain as a 10 debt claim, so the bank's total debt obligation would be 100. In the bad state, it would convert into a prespecified number of shares, so the bank's total debt obligation would remain at 90. (Note that in this extremely simple example, any shares would turn out to be worthless in the bad state.)

From a regulator's perspective, the bank should be viewed as just as well capitalized as before, since it is still guaranteed not to default in either state. Thus, the reverse convertible should "count" as regulatory capital. At the same time, the free-cash-flow problem is attenuated, because after paying off its debt, the bank now has less slack in the good state (10, rather than 20).[2] This is just a specific example of a general corporate risk management principle: capital structure and derivatives should be used to match net inflows with investment opportunities on a state-by-state basis, so that to the extent possible, firms never have too little or too much cash on hand at any point in time (see Froot, Scharfstein, and Stein [1993]).

Of course, this reverse convertible idea raises a host of practical questions concerning, for example, the specifics of security design, which are beyond the scope of this brief comment.[3] However, my goal is not to make the case for a particular new financial instrument, but simply to suggest that further creative thinking along these lines is likely to be valuable.

Endnotes

1. As Rochet points out, for any given value of k, one can improve the terms of the trade-off by relying on market-based signals and prompt corrective action. In the context of the model, suppose that at some interim time 1, one can observe a market signal that suggests that the bad state is coming. Moreover, if the bank is liquidated promptly, instead of waiting until time 2, one can recover $(1 - hv_i)$, where $h < 1$. This has the benefit that capital charges can be lowered in either the flat or risk-based regime.

2. If accounting concerns, such as a desire to have a high return on equity, also drive bank managers' reluctance to carry too much equity on the balance sheet, the reverse convertible may also be helpful on that dimension, to the extent that return on equity is now calculated based on balance-sheet equity of 5, rather than 10.

3. See Flannery (2002) for a detailed discussion of many of these issues.

References

Flannery, M. J. 2002. "No Pain, No Gain? Effecting Market Discipline via Reverse Convertible Debentures." Unpublished paper, University of Florida.

Froot, K. A., D. S. Scharfstein, and J. C. Stein. 1993. "Risk Management: Coordinating Corporate Investment and Financing Policies." Journal of Finance 48, no. 5 (December): 1629-58.