

# A MENU OF OPTIONS

*A Richmond Fed economist says that giving financial institutions limited choice about how they are regulated may produce a more stable and efficient banking system* BY ANDREW FOERSTER

Let's say a stranger comes to you and wants to borrow a significant amount of money. If you're reasonable, you'll sit back and assess the interest rate that you may charge, the time you'll let the loan go before repayment, and then you'll think about the chance that the stranger won't repay the loan. You may be extremely careful in determining whether the risk of not being repaid is worth the benefit of some additional interest in the future. Now imagine that the money you are considering lending is money that you yourself have borrowed from a second stranger. How will your decision be affected?

You may be a little less concerned if you are loaning out someone else's money. If your loan is repaid, then you keep the interest and pay back your own creditor. If the loan fails, you go tell your creditor you've lost the money. You keep the money if you win, and leave someone else with the bill if you lose. This situation is an example of what economists call moral hazard: You have incentives to take risks because you can pass the bill if things don't go your way.

Borrowing from and lending to strangers is what banks do every day. Depositors lend banks their money by placing it in savings and checking accounts, and banks put all of their deposits together and then make loans to individuals or businesses that are looking for extra cash. And since bank deposits are generally guaranteed up to \$100,000 by the Federal Deposit Insurance Corporation (FDIC) — meaning that depositors don't think about bank risk because they'll get their money back — banks can have an incentive to favor high-risk, high-reward loans.



One of the roles of the Federal Reserve System is to regulate banks and ensure they are behaving in a manner that is not too risky. The Fed shares this duty with several other institutions at both the federal and state level. These regulators have a responsibility to the public of preventing banks from making overly risky loans because of moral hazard, protecting the money of depositors, and encouraging banks to only make loans for projects that have a high probability of success.

The cost to society of having risky banks fail because of bad loans is potentially very high. During the 1980s, for example, savings and loan banks, burdened with loan portfolios ruined by high inflation, turned to making excessively risky loans, attempting to recover. Many of these risky loans

backfired, and the result was a massive number of failures and large government bailouts.

In a perfect world, regulators would be able to easily monitor banks' loan portfolios, somehow understanding the risk of each and every loan and therefore the risk of the entire portfolio. Reality, however, is more complicated. Occasionally, a bank may have some unexpected shock to its portfolio — such as a sudden change in the risk of a loan — and the bank knows about the shock but the regulator does not. This discrepancy in information between regulators and banks is an example of what economists call hidden information.

For an external inspector like the Fed, monitoring hidden information and managing moral hazard is of central importance. Research by economists at Federal

Reserve banks and universities looking at various ways regulators can handle hidden information and try to control moral hazard has led to consensus on broad issues, but occasional disagreement over details. Ned Prescott, an economist at the Richmond Fed, has two proposals to manage these two problems. First, he advocates giving banks limited choices as to how they are regulated, with the idea they will self-select options that help regulators monitor hidden information. Second, he argues for close examination of high returns as a way of managing moral hazard.

### **A Wide Degree of Uncertainty**

The economics literature differs in the details regarding prescriptions for regulating banks. In practice, regulation relies heavily on capital requirements, which limit the amount of leverage, or deposit financing, a bank can engage in.

So what is the optimal capital structure for banks? Economists do not agree on any one theory of capital structure for general firms. When considering a specific industry such as banking, the disagreement grows. With regard to general firms, a celebrated paper by Nobel Laureates Franco Modigliani and Merton Miller from the 1950s, "The Cost of Capital, Corporation Finance, and the Theory of Investment," argued that in a perfect economy, a firm's capital structure did not matter. They found that investments funded by borrowing or equity were equivalent because firm value depended only on the future stream of income from the investment, not on how the firm financed the investment.

In showing what did not matter, Modigliani and Miller helped point financial economists toward what did matter — departures from the model's perfect economy. A variety of departures such as taxes, bankruptcy costs, and agency costs have been developed.

One specific departure from Modigliani and Miller, and one considered highly relevant for bank regulation, is the work of Michael

Jensen and William Meckling, who use contract theory to discuss firm behavior. In their 1976 paper "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," they identified the equity owners as the decisionmakers of firms. The managers of banks would, they concluded, act in the best interests of the equity owners of the firm and not necessarily the debt holders. Specifically, the equity holders only care about the positive side of the risk — they hope to make a profit on their investment and do not care if the bank loses the debt holders' money.

Equity holders, though, do care about losing their own money, so the way to control risk-taking incentives is to keep debt financing down. This is the logic behind capital requirements. Banks are highly leveraged firms — a large part of their funding comes from deposits, which are essentially a form of debt financing. The greater a bank's capital — its equity as a fraction of assets — the more equity holders have to lose.

In recent decades, globalization has put banks from different countries in competition with one another, so the financial community must strive for not only ideal capital regulation in the United States, but also ideal capital regulation in the entire world.

With this push toward global banking competition in mind, the United States entered into the international Basel Accord in 1988, which set general standards for capital regulation of banks in all agreeing countries. The standards set by Basel I, however, were fairly primitive, as capital requirements only depended on the types of assets a bank held. Each bank, with little regard to its loan portfolio's risk, had a set percentage of its assets that it had to hold as equity. The assessed risk on each loan in a bank's portfolio depended on broadly based categories — such as commercial versus government loans — that generally told little about the risk of each loan.

The deficiencies of the Basel Accord led to a follow-up agreement, Basel II, which is currently under consideration in the United States.

Basel II is designed to change capital regulation mainly for large, internationally active banks. The new standards focus on three broad pillars: identifying and controlling risk, supervisory review, and market supervision. More sophisticated than that of Basel I, the capital regulation of Basel II relies heavily on a bank's self-assessment. Using their internal models of risk, each bank will report to the regulator their estimates of several figures, including risk and losses given default, for each loan. This assessment then determines the capital requirements that the bank has to meet given its overall risk.

The issue of regulation therefore returns to one of hidden information between the regulator and the bank. Even if the regulator has some information, the bank will always have more. What then has Basel II solved? In order for the system to work as planned, incentives must be provided to make banks report risk accurately. Clearly, nobody understands a bank's risk better than the bank, so self-assessment will be better than anything an outsider could produce.

### **New Proposals from a Fed Economist**

Ned Prescott, an economist in the field of banking regulation theory at the Richmond Fed, advocates several novel approaches to regulating banks under Basel II. After doing his dissertation at the University of Chicago on contract theory and sharecroppers in less developed countries, Prescott looked for other ways to use the widely applicable tools of contract theory.

He turned to researching bank regulation, a change that came naturally, he notes, because "contract theory models were well designed to address bank regulation issues." Specifically, contract theory, originally developed to handle insurance problems created by moral hazard and hidden information, could look at deposit insurance in the banking industry. "A lot of bank regulation deals with perverse incentives caused by deposit insurance, so contract theory is a natural fit for study-

ing bank regulation,” Prescott says.

Prescott’s research agenda fits nicely with critical elements of Basel II. He sees the new accord as a step forward in bank regulation, but only if implemented properly. To be successful, it must address banks’ incentives to conceal private information about risk. “What incentive does a bank have to report the true risks of its assets?” he asks. “Without adequate supervision and appropriate penalties, the answer is, ‘Not much.’”

With this need for supervision in mind, Prescott focuses his research on ways bank regulators can manage the problems of moral hazard and hidden information. Traditionally, regulators use inspections and sanctions to ensure that banks meet capital requirements. Using these traditional tools in flexible ways, Prescott finds, can lead to a more efficient bank regulation structure and better results from the banking sector.

But how does the regulator achieve this efficient structure and ensure that banks follow the rules when it cannot perfectly monitor banks? In other words, since regulators have limited resources, what is the best way to allocate those resources in regulating banks? Prescott’s theories challenge the traditional way that banking regulation is performed. He feels that his proposals to discourage banks’ risk-taking are cost efficient and will not inhibit the actions of safe banks.

Prescott thinks one way to regulate banks easily is by giving banks choices from a menu of capital requirements and inspection intensity. Banks that look similar from the outside might face a trade-off along the following lines: the higher the capital requirement, the less intense the inspection. The striking result, Prescott says, is that regulators will end up inspecting the relatively safe banks that have lower capital requirements.

Isn’t this counterintuitive? Shouldn’t regulators inspect risky banks, not safe ones? Not exactly, says Prescott, noting, “The reason for this seemingly counterintuitive result is that inspections *prevent* risky banks

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from declaring that they are safe banks.” Banks wish to avoid penalties, which they incur if inspections find that they did not hold enough capital for their risks. Banks that do not want to be penalized during inspections will accept tougher capital regulations; banks that wish to have eased capital restriction accept the possibility of getting an inspection.

The reason the regulator doesn’t inspect risky banks is that those banks have admitted to being risky by accepting higher capital requirements. “[With proper penalties] no one wants to claim to be riskier than they actually are, [so] inspecting a bank that claims it is the highest risk is unnecessary,” Prescott asserts. “This bank has agreed to hold more capital, and that is all the regulators desire.” In the end, banks are not hiding any information, as they self-report the right amount of capital they should hold.

The advantage of this capital requirement and inspecting structure is that banks choose their own capital level from several options in a way that reveals their true risk level. Prescott’s ideas for a menu of contracts extend from the original “precommitment approach,” advocated by Paul Kupiec and James O’Brien of the Fed’s Board of Governors. Under the precommitment approach, banks would set their own capital requirements, much like under Basel II, and then incur fines if they ended up not holding enough to cover any losses they received. This basic self-selection extends to a menu of contracts by offering specific options rather than letting banks set arbitrary capital levels.

### Free to Choose

This idea of using a menu of contracts is not relevant only to banking regulation — insurance companies use it all the time. For example, most auto insurers let you choose your coverage from several packages. You assess your risk, and choose a package with deductibles, coverage, and payments that fit your risk most appropriately. Since the situation is similar in banking, it makes sense for the regulators of banks to give similar options to the banks under their supervision.

Prescott’s personal experience contains another example of a menu of contracts in regulatory environments. He recalls a trip to Mexico, where each individual going through customs had to choose a line: green or red. People in the green line had a low probability of being searched, but violations carried hefty fines. Those in the red line were automatically searched, but lower fines accompanied violations. Since officials clearly stated the nature of each line, travelers could choose the option that fit them best. In a similar manner, Prescott believes, banks should be able to choose from a menu the option that fits best.

Despite the political or legal barriers, Prescott points to practices that mimic the menu of contracts approach. “Some practices use menus of contracts implicitly,” he says. For example, the internal models approach to banking regulation — presently used for a portion of a bank’s portfolio — requires banks to estimate their own value-at-risk, which is a statistic estimating potential losses. Based upon this statistic, banks must set a certain level of capital. Since their internal models determine their capital requirement, banks can alter those internal models to yield preferred results. Specifically, a bank can make its estimates risky or safe in order to influence the exact amount of its capital requirement. But the bank is penalized if losses on the portfolio exceed the capital they hold.

Prescott also studies the presence of moral hazard, which encourages banks to make risky loans, particularly when

they are poorly capitalized or in bad economic condition. Over time, banks that submit to this temptation will typically have more variation in their returns than those banks that have relatively safe and steady loan portfolios. Risky banks understand that some of their loans have a significant chance of failing, but hope to reap significant gains from those which are repaid.

The savings and loan banks of the 1980s provide a good example as to what happens when banks gamble. The inflation of the early 1980s significantly decreased the values of loan portfolios of many of these savings and loan banks, putting them on the path to financial ruin. In an attempt to break even, these banks made more and more risky loans, hoping that having a few succeed would bring in enough profit to keep the bank alive. If these risky loans did not pay off, the bank would still be insolvent, or no worse off than before making the loans.

This strategy of “gambling for resurrection” stands in contrast to sound banks, which did not need to make the extremely risky loans to stay afloat. These safer banks could continue making lower-risk, “safe and prudent” loans because they did not face a financial crisis.

Banks that make unusually high returns, therefore, may be in financial trouble and gambling for resurrection. The risky gambling may pay off and

produce high returns, but sends a clear signal that a bank is excessively risky. One way to discourage this risk, Prescott argues, is to use regulatory contracts that include fines when banks generate extremely high returns, because it discourages high risk-taking strategies.

In “Bank Capital Regulation with and without State-Contingent Penalties,” with co-author David Marshall of the Chicago Fed, Prescott admits, “the particular form taken by the optimal fine schedule is somewhat unusual.” In a subsequent paper “State-Contingent Bank Regulation with Unobserved Actions and Unobserved Characteristics,” the same authors admit that the contracts that they advocate “often require fines on high returns, an approach that could encounter political and even legal obstacles.”

Others have raised concerns as well. John Boyd of the University of Minnesota, in published comments on Prescott and Marshall’s work, worries about the proposed fines’ effects on innovation. He notes, “It would be extremely difficult for regulators to distinguish between large profits due to risk-seeking and those due to financial innovation.” Pointing to several risky innovations in the 1990s that turned out to be successful, he worries, “there would be social costs to any tax scheme which penalized such marvelous innovations.”

Responding to the criticisms that their proposed fine system would face implementation barriers and stymie innovation, Prescott and Marshall suggest using inspections rather than fines. That is, instead of fining banks that produce extra-high returns, regulators could trigger inspections to determine if the returns resulted from financial innovation or inappropriate risk. In this way, the high returns act as a sort of “red flag” signal to regulators.

These banking regulation proposals would help reduce the risk that banks take, a good result for society. Risky banks that fail can lead to large payments from the FDIC to depositors, which costs the government money. In addition, risky banks make loans to businesses or individuals that are not deserving of the loan because of low probability of repayment. In other words, risky banks help fund inefficient projects. The loans made to the undeserving groups could be made to companies or people with better plans for using the funds.

Prescott hopes to expand his research in the future to consider the third pillar of Basel II, which focuses on market supervision. He is looking into how regulators can use market data to help create better regulatory environments, allowing banks to do business while encouraging safe practices. **RF**

## READINGS

Boyd, John. “Bank Capital Regulation with and without State-Contingent Penalties: A Comment.” *Carnegie-Rochester Conference Series on Public Policy*, June 2001, vol. 54, no. 1, pp. 185-189.

Jensen, Michael C., and William H. Meckling. “Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure.” *Journal of Financial Economics*, October 1976, vol. 3, no. 4, pp. 305-360.

Kupiec, Paul H., and James M. O’Brien. “The Pre-Commitment Approach: Using Incentives to Set Market Risk Capital Requirements.” Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series Paper no. 1997-14, March 1997.

Marshall, David A., and Edward Simpson Prescott. “State-Contingent Bank Regulation with Unobserved Actions and Unobserved Characteristics.” Federal Reserve Bank

of Richmond Working Paper no. 04-02, February 2004.

—. “Bank Capital Regulation with and without State-Contingent Penalties.” *Carnegie-Rochester Conference Series on Public Policy*, June 2001, vol. 54, no. 1, pp. 139-184.

Modigliani, Franco, and Merton H. Miller. “The Cost of Capital, Corporation Finance, and the Theory of Investment.” *American Economic Review*, June 1958, vol. 48, no. 3, pp. 261-297.

Prescott, Edward Simpson. “Auditing and Bank Capital Regulation.” Federal Reserve Bank of Richmond *Economic Quarterly*, Fall 2004, vol. 90, no. 4, pp. 47-63.

—. “The Pre-Commitment Approach in a Model of Regulatory Banking Capital.” Federal Reserve Bank of Richmond *Economic Quarterly*, Winter 1997, vol. 83, no. 1, pp. 23-50.

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