More on Taxing Risk

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Introduction

The title of this workshop is: "Lessons from the Recent Crisis for Monetary Policy and Financial Regulation." I suspect that I'm on this conference program because I am a monetary policymaker. Nonetheless, my remarks will focus on the lessons of the crisis for financial regulation. In doing so, I'm continuing an institutional tradition. My predecessor, Gary Stern, and my current head of supervision, Ron Feldman, literally wrote the book on how to deal with "Too Big to Fail" in 2004. Long before that, while working at the Minneapolis Fed, John Kareken and Neil Wallace sounded the alarm about the moral hazard generated by deposit insurance. This institutional history makes it especially important that I emphasize that any views I share today are my own, and not necessarily those of others in the Federal Reserve System.

My own thinking about financial regulation begins with what I see as the inevitability of collective mistakes. In the mid-2000s, we—as American investors, home owners, and bank lenders—collectively bet that house prices would not fall by 30 percent in most major metropolitan areas in three years. We were wrong. This mismatch between our expectations and our realizations was the ultimate source of the financial crisis of 2007-09.

My view is that no law can completely eliminate the kinds of collective investor and regulator mistakes that lead to financial crises. These mistakes have taken place periodically for centuries. They will certainly do so again. And once these crises happen, there are strong economic forces that lead policymakers—for the best of reasons—to bail out financial firms. In other words, no legislation can completely eliminate bailouts.

My theme today is that, even though they are inevitable, the likelihood and the magnitude of financial crises and bailouts can be limited by taxes on financial institutions. I arrive at this conclusion about the usefulness of taxes by thinking through an analogy that I'll develop at some length. I will argue

that, knowing bailouts are inevitable, financial institutions fail to internalize all the risks that their investment decisions impose on society. Economists would say that bailouts thereby create a risk "externality." There is nearly a century of economic thought about how to deal with externalities of various sorts—and the usual answer is through taxation. Taxes are a good response because they create incentives for firms to internalize the costs that would otherwise be external.

I will emphasize the desirable incentive effects of taxes. Much of the dialog about taxes on financial institutions emphasizes revenue collection goals. I will argue that correcting incentives and generating revenue are largely separate objectives. The United States could design a tax system with the right incentives and collect $5 billion per year from financial institutions. On the other hand, Canada could design a tax system with the right incentives and collect no revenue from financial institutions. Countries could well differ on their revenue collection objectives. But all should be interested in getting incentives in place to deter excessive risk-taking by financial institutions.

Many policymakers are advocating taxation as a key instrument of financial regulation. Sweden has implemented a bank tax. The United Kingdom, France, and Germany seem likely to follow. In the United States, the Obama administration has recommended the adoption of a levy on large financial institutions. The International Monetary Fund recently released a staff report that recommends a global tax on the financial sector.

In its June 27, 2010 communiqué, the G-20 agreed that countries should finance the response to financial crises through policies that accomplish five goals:

1. Protect taxpayers
2. Reduce the risks from the financial sector
3. Protect the flow of credit in good times and bad
4. Take into account individual countries' circumstances and options

5. Help promote a level playing field.

The G-20 made no specific recommendation about how to achieve these goals. But I hope to convince you that taxation is the best way to meet all five objectives.

My remarks today will overlap with those that I gave in Minneapolis on May 10.[1] I build on the previous speech in two ways. First, I spend more time explaining the advantages of taxes over other regulatory responses. Second, while I discuss my preferred ideal tax system, I also describe some essential features for any desirable tax system.

Inevitability of Bailouts

I began by saying that bailouts of financial institutions are certain to occur in financial crises. Why do I say this? There are many forces at play, but I believe that the strongest has to do with the very nature of financial intermediation. Investors in financial institutions always want the ability to pull their funds out quickly. For this reason, financial institutions' liabilities often take the form of short-term debt and deposits. But short-term financing instruments are intrinsically prone to self-fulfilling crises of confidence commonly referred to as "runs."

Imagine that Bank X needs $100 billion of one-day loans to survive. This means that for a given lender to be willing to make a $1 billion, one-day loan to Bank X, that lender has to believe that Bank X will get another $99 billion in one-day loans. Then, Bank X may fail simply because every possible lender believes correctly that no lender is willing to lend to Bank X. Such a crisis of confidence can occur regardless of the true condition of Bank X.

[1] Kocherlakota, Narayana R. 2010. "Taxing Risk." Comments at the Economic Club of Minnesota (May 10): Minneapolis, Minn. Online at http://www.minneapolisfed.org/news_events/pres/nrk05-10-10.pdf and http://www.c-spanvideo.org/program/ie/223884.

This story is hardly a new one. It's exactly why we have deposit insurance: to prevent runs by reassuring short-term bank depositors that their money is safe. But the story has huge consequences for how governments operate. In a financial crisis, there is a tremendous sense of uncertainty. There are some truly insolvent financial firms out there—but no one knows for sure which ones are insolvent and which are sound. And during a crisis, the panic in the air means that any institution—even one with solid fundamentals—may be subjected to a run if its investors lose confidence in its solvency.

In such an atmosphere, contagion effects become extremely powerful. Even a slight loss by one short-term creditor can lead all short-term lenders to rush to the safety of Treasury bills. Such flight would endanger the survival of key financial institutions, even if they are fundamentally sound. Governments cannot risk systemic collapse, and so during times of crisis, they end up providing debt guarantees for financial institutions. Thus, policymakers inevitably resort to bailouts even when they have explicitly resolved, in the strongest possible terms, to let firms fail.

Many observers have emphasized the need for better resolution mechanisms as part of financial regulatory reform. Different people mean different things by this, but most want to impose losses on debt holders. I'm not opposed to faster and better resolution of bankruptcies. But I do not believe that better resolution mechanisms will end bailouts. Indeed, I'm led to make a prediction. No matter what mechanisms we legislate now to impose losses on creditors, Congress, or some agency acting on Congress' behalf, will block those mechanisms when we next face a financial crisis. And Congress will do so for a very good reason: to forestall a run on the key players in the financial system and thereby prevent system-wide collapse.

Investment Inefficiencies

So, that's my first point: Bailouts are inevitable during financial crises. Let me move to the second: Anticipation of bailouts creates inefficiency in the allocation of real investment. Here's what I mean. Financial institutions make investments that are, by their very nature, risky—that is, their returns are not certain. They finance these investments, at least in part, using debt and deposits.

Now, imagine for a moment that we live in a world without bailouts, so that the government does not provide debt guarantees or deposit insurance. In such a world, if a financial institution decided to increase the risk level of its investment portfolio, its debt holders and depositors would face a greater risk of loss. By way of compensation for that greater risk, they'd demand a higher yield. As a result, in the absence of government guarantees, financial institutions would find it more costly to obtain debt financing for highly risky investments than for less risky ones. This effect, on the margin, would curb a firm's appetite for risk. It would have an especially powerful effect on highly leveraged financial institutions, because high debt-to-asset levels mean higher risk of being unable to fulfill debt obligations.

But now return to the real world, with deposit insurance and debt guarantees, and the inevitability of government bailouts. Even if they only kick in during financial crises, these guarantees change the natural market relationship between risk and cost. Depositors and debt holders are now partially insulated from increases in investment risk, and so they do not demand a sufficiently high yield from riskier firms. Financial institutions take on too much risk, because they are no longer deterred from doing so by the high cost of debt finance. And this missing deterrence is especially relevant for firms that are highly leveraged, because they should be paying out especially high yields on their debts.

In this way, the expectation of bailouts leads to too much capital being allocated toward overly risky ventures. These misallocations of capital don't create the collective mistakes in predictions that

generate financial crises. But the misallocations do mean that society loses a lot from those mistakes—a lot more than is efficient.

Regulatory Responses

There are a number of regulatory responses that would help mitigate the misallocation problem just described. In its June 27 communiqué, the G-20 put special emphasis on enhancing capital and liquidity requirements. Both would deter risk-taking by financial institutions. However, it is important to understand and consider the costs that they impose on an economy.

Let me talk first about capital. High capital requirements are designed to reduce the amount of debt issued by a financial institution. With less debt, there are fewer failing firms that policymakers must bail out during financial crises. With lowered needs for government debt guarantees, there is less inefficiency. Consider the extreme situation of a financial institution that is financed only by equity, and not by debt or deposits. Such an institution would never get any bailouts from the government, and so would not engage in excessive risk-taking.

However, financial economists have long recognized that debt has important benefits. Outside investors are typically not as well-informed about firm attributes as decision makers inside a firm. In this context, debt—and the associated threat of bankruptcy—helps discipline firm insiders. For example, one essential feature of equity is that a firm can vary its dividend payments to investors. But this very flexibility allows managers and other firm insiders more freedom to divert firm income to themselves and away from outside investors. Having to repay debt imposes much sharper constraints on managers—a discipline that both equity holders and debt holders value. As a result, firms that use a mix

of debt and equity should be able to raise more outside funds for a given investment opportunity than firms that use equity alone.

The above argument applies to all kinds of debt. (In passing, the argument depends on the firm's debt only being guaranteed *during financial crises*. Perfectly guaranteed debt holders, such as depositors, will impose no discipline on managers.) However, short-term debt is especially relevant. Suppose outside investors learn that a firm's managerial team has been making poor choices. In this context, equity holders and long-term debt holders cannot retrieve their investments without finding some other firm outsider to buy them. In contrast, short-term debt holders and depositors have the ability to withdraw their entire investment from the firm without using sales.

To sum up: It is true that debt—especially short-term debt—increases the size of government transfers that a given firm will potentially receive during a financial panic. From that point of view, restrictions on debt issuance are attractive. At the same time, debt—especially short-term debt—helps align the incentives of managerial insiders and investing outsiders. Tougher capital standards will undercut this alignment, and inhibit economic growth.

Another potentially useful regulatory response emphasized in the G-20 communiqué is to require financial institutions to hold more liquid assets. Again, such a requirement would help reduce the need for government bailouts. Consider an extreme example. Suppose all financial institutions were required to hold cash equal in value to their deposits. There would be no need for deposit insurance, as depositors would always be sure that they could obtain their funds.

Such a regulation would obviously be inefficient, though. While it is certainly true that bank depositors have the right to retrieve their deposits within seconds, they rarely exercise that right. The typical dollar stays in a bank for many months before being withdrawn. This timing means that banks can safely invest deposits in longer-term, higher-yield investments. Indeed, many economists have

identified this so-called “maturity transformation” of demandable deposits into long-term investments as being the defining feature of banks.

So there are benefits and costs associated with liquidity requirements, just as there are with capital requirements. Banks with more liquid asset holdings are certainly better protected against the possibility of runs, but they’re also performing less of the maturity transformation that improves capital allocation and economic efficiency. The right liquidity requirement for a given bank will depend critically on the nature of its investment opportunities, the fluctuations in the inflows and outflows of its deposits, and its ability to access short-term debt funding.

Along with capital and liquidity requirements, financial regulators have a host of other approaches at their disposal to curb excessive risk-taking. With this portfolio of possible instruments, it is important to find the right combination of regulations for financial firms. However, as we have discussed for capital and liquidity requirements, all regulations have private costs as well as social benefits. Because of these private costs, regulators cannot find the optimal mix of regulatory requirements for a firm without solving that firm’s cost minimization problem with respect to capital, liquidity and many other variables.

Taxes

Is there a different government response to excessive risk-taking that would allow regulators to avoid solving the cost minimization problems of financial firms? In what follows, I offer an analogy from a completely different arena of public policy that can help us think through this key question.

Consider a factory that creates air pollution as a byproduct of operation. When the firm that owns the factory chooses to produce more output, it incurs various *private* costs: more raw materials,

more labor, and so on. But the production increase also generates more pollution that will be absorbed by the surrounding community. The pollution is a *social* cost of production not paid for, or "internalized," by the firm that generates it. Economists refer to such costs as "externalities."

This same distinction between private and social costs applies to financial institutions that enjoy debt guarantees. Such guarantees imply that some portion of the risk produced by a firm's investment decisions is absorbed by taxpayers. In making decisions about what to invest in, the firm ignores that portion of risk. It is a social cost of the project that the private firm does not internalize. Just like the pollution, the risk borne by taxpayers is an externality—what I will call a "risk externality."

This analogy is useful because economists know a lot about how to deal with externalities. We can exploit their years of research to address the problem of financial regulation when government bailouts are inevitable. In particular, that long history of thought says that the best way to correct externalities is by providing the right kinds of incentives through appropriate taxes.

Let me be more specific. Again, let's think about the firm with a polluting factory. Many of its choices affect the amount of pollution generated, including the amount of time that the firm runs the factory during the workweek, the sorts of antipollution technology employed, and the kind of energy used to run the factory. Now, the government could regulate the firm's pollution levels by controlling each and every one of these choices. However, to do so, the government has to choose how to trade off these three (and other) factors against one another.

Its trade-off decisions will be influenced by both pollution considerations and cost factors. If antipollution technology is cheap, the government may simply require the firm to invest in that. But if antipollution technology is expensive, the government may require the firm to buy clean energy instead. Making these trade-offs requires a tremendous amount of firm-specific information and firm-specific

cost minimization analysis. To put it mildly, historical evidence suggests that governments are not very good at such micromanagement of factory-level operation; that's why we have private markets.

The solution to this difficulty is to regulate the *amount* of pollution generated by the firm, rather than *how* the firm creates it. The central problem here is that pollution has a social cost that the firm does not internalize when choosing its level of production. From society's point of view, the firm will generate excessive pollution. However, the firm *will* create the socially efficient level of pollution if it is required to pay for—or internalize—its full social cost.

More concretely, suppose that the firm is told, before choosing its level of production, that the government will measure the amount of pollution that the firm generates and charge the firm a tax that is exactly equal to the social cost of that quantity of pollution. This policy generates a tax *schedule* that translates the amount of pollution generated into an amount paid by the firm. If the firm knows that it faces this tax schedule, its costs of production will include the social cost of pollution, along with the costs of labor, materials, energy, and the like. In this way, what was external to the firm becomes internal. As a result, the firm will choose the socially efficient level of pollution. Just as importantly, it will automatically choose to create that pollution—and the factory's more beneficial outputs—in a cost-minimizing fashion. Governments do not need to solve the firm's cost-minimization problem.

Lessons for Financial Regulation

These lessons about pollution regulation translate directly into lessons for financial regulation. As in the pollution case, a financial institution should be taxed for the amount of risk it creates that is borne by taxpayers. Once the firm faces the correct tax, it will choose to produce that risk with a cost-minimizing mix of capital, liquidity, incentive compensation and other factors. As in the pollution case, using taxes

to discourage excessive risk saves the government from actually trying to solve the cost-minimization problem of financial firms.

This reasoning suggests the following idealized policy. The firm is told that the government will estimate the expected, discounted value of bailouts that the financial institution (or any of its stakeholders) will receive in the future. I say "expected" because the amount of the bailout is uncertain (and indeed is likely to be zero much of the time). I say "discounted" because the bailout may be received next year or in 30 years, and we need to discount accordingly. Getting the right discount rate is important. The bailouts will be large when the stock market and the economy are doing poorly. In the language of finance, the bailouts have a negative beta. It follows that the appropriate discount rate should be less—and possibly substantially less—than the rate of return on Treasuries.

Clearly, this estimate will depend on many firm choices and attributes, including its leverage ratio, the maturity structure of its liabilities, the risk characteristics of its investment portfolio, its incentive compensation schemes, and its involvement in the payment system. For example, the expected bailout will be higher for firms with highly risky investments than for firms with less risky portfolios.

Having done this calculation, the government then charges the firm a tax that is exactly equal to the expected discounted value of the firm's bailouts. Just as in the pollution example, this measurement-plus-taxation policy confronts the firm with a tax schedule that translates its choices into a cost paid by the firm. The tax amount exactly equals the extra cost borne by the taxpayers because of bailouts, appropriately adjusted for risk and the time value of money. Knowing that it faces this tax schedule, the firm no longer has an incentive to undertake inefficiently risky investments. Its investment choices will be socially efficient. It is useful to tax a financial institution producing a risk externality, just

as it is useful to tax a firm generating a pollution externality. The purpose of the tax in both instances is to ensure that the targeted firm pays the full costs—private and social—of its production decisions.

My proposed tax creates the right kinds of incentives for risk-taking. As I mentioned in the introduction, these incentives are distinct from revenue objectives. The risk tax will raise some amount of revenue. Governments wishing to collect more revenue from the financial sector can impose an additional one-time levy on financial institutions that is not risk-based. Other governments may want to collect less revenue from the financial sector. In that case, they can transfer back some of the risk tax collections. These transfers need to be structured so that they do not undo the incentives in the risk tax itself. For example, they could simply be spread evenly across all financial institutions.

A risk tax does require bank supervisors to calculate the expected present value of future bailout payments. These calculations are likely to be complex in a number of ways. Moreover, the calculations could well be controversial. Financial institutions that follow highly risky strategies get especially high profits when those strategies are working. Thus, supervisors would be required to levy high risk taxes on exactly those institutions that appear to be extremely successful. To address these issues of complexity and controversy, it would be of great value to develop an objective way—with the use of market information— to compute the required tax.

Here's what I have in mind. Suppose that, for every relevant financial institution, the government issues a "rescue bond." The rescue bond pays a variable coupon equal to 1/1,000 of the transfers made from the taxpayer to the institution or its stakeholders. (I pick 1/1,000 out of the air; any fixed fraction will do.) Much of the time, this coupon will be zero, because bailouts aren't necessary and so the firm will not receive transfers. However, just like the institution's stakeholders, the owners of the rescue bond will occasionally receive a large payment. In a well-functioning market, the price of this bond is exactly equal to the 1/1,000 of the expected discounted value of the transfers to the firm and its

stakeholders. Thus, the government should charge the financial firm a tax equal to 1,000 times the price of the bond. Note that the "rescue" bond is only a measurement device. In particular, it is not part of the financial firm's rescue.

Notice that this approach could be used for a wide variety of financial institutions, including nonbanks. In principle, the government need not figure out in advance exactly which are systemically important and which are not. Instead, it could simply issue a rescue bond for every institution. Then the market itself could reveal how systemically important each institution is through the price of its rescue bonds. Of course, markets are not always perfect. It may not always be appropriate to rely only on market measures to compute the appropriate taxes. However, even in these cases, the prices of rescue bonds would contain valuable information that should be an important input into the supervisory process.

General Rules for Implementation

In describing the above tax system, I've glossed over a variety of political and administrative realities. In this sense, I would have to say that my tax system should be viewed as an ideal. Nonetheless, like all economic ideals, I believe that it suggests general rules that can be used to discipline the construction of any tax on financial institution risk.

The first rule is that a useful tax on risk must take into account the existence of deposit insurance. Deposit insurance means that deposit rates of return are independent of the underlying risk in bank assets. Like any debt guarantee, it incentivizes excessive risk-taking by financial institutions. A good tax must undo these incentives.

In many countries, banks pay risk-based deposit insurance premia. If levied on top of an explicit risk tax, these premia create the possibility of inefficient double taxation. However, it is straightforward to design a tax system that avoids this possibility. First, calculate the overall tax on risk for the financial institution (based on its assets, liabilities and other attributes). Then, deduct whatever premium the bank is paying to the deposit insurer.

Alternatively, it may be desirable to simply re-label what I'm terming a "bank tax" or "risk tax" as a "systemic insurance premium." It could then be collected by a regulatory agency, as opposed to the Treasury.

The second rule is that risk taxes must always be collected. Many of the proposals for taxes on financial institutions (and the actual law in Sweden) put a cap on tax collections. Once that cap is reached, banks will no longer face taxes for taking on extra risk and will again have an incentive to engage in excessively risky investments.

As I indicated earlier, it's important to keep revenue objectives separate from incentive correction. Some governments may find it desirable to stop collecting revenues from the financial sector after some point in time. They can readily do so while preserving the incentives of the risk tax system. My point is that those incentives must always be kept in place.

The third rule is that any tax on risk must incorporate market information. The goal of a tax on risk is to force financial institutions to internalize the costs that their investing decisions impose on taxpayers by virtue of government debt guarantees. These costs are forward-looking valuations of future risky cash flows. It is impossible to have accurate measures of the costs without market information about both the quantity and the price of risk embedded in these cash flows.

Rescue bonds provide one highly precise but perhaps impractical way to use market information. A cruder, possibly more practical approach would be to use measures from the ratings agencies. Moody's and Standard & Poor's each provide two distinct ratings for the debt of various financial institutions. One rating considers the financial institutions as they are, and the other considers the institutions in an imaginary world without government support. The difference between the two is termed "ratings uplift" and it can be substantial. In principle, a regulator can translate these uplifts into differences in debt yields, and thereby into measures of implicit government subsidies.

Conclusions

Let me close with some final thoughts about capital. As I stated earlier, the June 27 G-20 communiqué emphasizes the role of capital requirements in forging a new regulatory structure. The communiqué suggests that banks be required to hold enough capital "to withstand … stresses of a magnitude that they experienced during the recent financial crisis" without government support. This response strikes me as being problematic in a couple of ways.

First, good financial regulations should take into account the probability and timing of various possible outcomes. The recent crisis is generally agreed to be the biggest of its kind since 1929. Should financial institutions be required to protect themselves fully against shocks that take place just once in eighty years? This kind of extreme risk aversion in regulatory design seems likely to create an undue drag on economic growth.

Paradoxically, the G-20's capital requirement proposal also strikes me as too weak. The magnitude of our recent financial crisis was created in part by the investment decisions of leading global financial institutions. These institutions have the ability to generate even bigger shocks and their

creditors would be likely to receive even more substantial government transfers in that event. Good regulation should deter them from creating the potential for adverse shocks bigger than those we have observed historically. The proposed capital standard does not.

Thus, capital is at once too strong a tool and too weak a tool. More generally, it seems to me that capital and liquidity requirements are intrinsically backwards-looking. We need forward-looking instruments for what is intrinsically a forward-looking problem. And that's a key reason why taxes, based on market information, will work better.

To wrap up: Bailouts will inevitably happen during financial crises to prevent runs and systemic collapse. We need to structure financial regulation so as to limit the size and frequency of these bailouts. How should we best design such regulations? The social distortion we face is that debt guarantees create a risk externality, because financial institutions do not bear the full costs of their investment choices. Financial regulation should be designed to best control that externality. Capital and liquidity requirements may be helpful, but they are likely to create inefficient drags on growth.

Instead, as is true with any externality, the risk externality can be eliminated with a well-designed tax system. I've suggested some properties for a good tax system. In particular, I believe that any such tax should embed appropriate information from financial markets.