2016 ■ Number 13

ECONOMIC Synopses

Who Exactly Benefits from Too Big To Fail?

Christopher Waller, Research Director

Neel Kashkari, president of the Federal Reserve Bank of Minneapolis, has revived discussion of the Too Big To Fail (TBTF) issue for large U.S. financial institutions. TBTF arises when the government and regulators fear that a bank's failure would cause widespread damage to the financial system. Consequently, when a large bank or highly interconnected bank is on the verge of failure, the government steps in and prevents its collapse. When this happens, howls are heard that the government is "bailing out" equity and bond holders at taxpayer expense and that the proper action is to wipe them out.

Why is having a bank labeled TBTF a problem? First, by being viewed as TBTF, a bank receives an insurance policy against default from taxpayers but does not pay a premium for this insurance. Second, being provided with this insurance creates moral hazard since bank management can undertake riskier activities and reap the higher returns while shifting the risk of default to the taxpayer. Note that the first benefit occurs even if the bank does not change the risk structure of its balance sheet—e.g., even if it does not engage in moral hazard. Thus, it is important to keep in mind that having TBTF status is not just about moral hazard. It is also about the provision of free insurance to the bank by the taxpayer. This latter point is often overlooked in discussions of TBTF.

But, as heretical as it may sound, are the *current* equity holders and bank creditors the true beneficiaries of the bailout? The answer depends on whether or not the TBTF designation for a bank was accounted for in its equity and debt prices at an earlier date. If a bank is declared TBTF unexpectedly *at the moment* it is about to default, then equity and bond holders are bailed out since their asset positions did not price-in this status at the time of purchase.

However, what if the TBTF designation was given *prior to* default? Looking back at the financial crisis, this seems to be the more-relevant case. Ron Feldman and Gary Stern warned about banks having this designation in their 2004 book, *Too Big to Fail: The Hazards of Bank Bailouts*, and the risks it created for the U.S. taxpayer. They point out that the failure of Continental Illinois in 1984, the seventh largest bank in the U.S. at the time, and the government's generous treatment of unsecured creditors brought TBTF front and center into the public policy arena. Feldman and Stern succinctly summarize the TBTF problem: "The roots of the TBTF problem lie in creditors' expectations...and the source of the problem is a lack of credibility" that the government will let them fail. Thus, the problem with TBTF is that a bank is viewed this way long before it actually gets into trouble.

> TBTF status leads to a wealth transfer from new buyers to existing holders of the debt.

It is exactly this timing that makes it difficult to determine who benefits from TBTF. To make this scenario as stark as possible, suppose the government knows that its promises to let bank A fail are not credible. So the government simply announces at date t that bank A is too big to fail and will be bailed out if it is on the verge of default.

What will happen at the time of this announcement? Bank A's equity price will increase to reflect the absence of default risk associated with this new designation. Furthermore, the price of the bank's outstanding debt and its newly issued debt will increase to reflect the elimination of default risk.

So who benefits from this? Well, obviously those holding equity claims on bank A when the TBTF status is announced. They get a capital gain on their shares from the price appreciation. The same is true for those holding bank A debt—the higher price of bank A debt would generate a capital gain to the debt holders at the time of the announcement. This all happens even if the bank does not change the riskiness of its portfolio.[1]

But what about those who buy bank A stocks and bonds *after* the announcement? If financial markets are efficient, then the TBTF status should be fully capitalized into the value of the bank. As a result, a risk-neutral investor would be indifferent between (i) buying the stock at a low price without TBTF protection and (ii) buying the stock at a higher price but with TBTF status. In short, new buyers are paying for the TBTF insurance via higher equity and bond prices. They do not receive a windfall from the TBTF status assigned to bank A.

To illustrate with a simple example, suppose bank A has an outstanding simple discount bond at time t that matures in period $t+1$ with face value of $1. Assume the probability of default is zero in period t but occurs with an exogenous probability $\pi > 0$ in $t+1$. If default occurs, the bond holder gets zero. Since default is purely exogenous, moral hazard does not come into play. In the absence of TBTF status, the time t price of the bond that a risk-neutral investor would pay to acquire the bond is

$$p_t = \left(\frac{1}{1+i}\right)(1-\pi),$$

where i is the discount rate used by all investors. Note that the bond price reflects the probability of default.

Now suppose that, at the beginning of period t, the government announces that bank A is too big to fail. Then the bond price will instantly jump to

$$\hat{p}_t = \left(\frac{1}{1+i}\right) > p_t.$$

So the initial holder of the debt reaps a capital gain of

$$\hat{p}_t - p_t = \frac{\pi}{1+i} > 0$$

from selling his bond after the announcement. However, the new buyer has to pay a higher bond price to get this "insurance" from the government. Thus, the TBTF status leads to a wealth transfer from new buyers to existing holders of the debt. Note that the difference $\hat{p}_t - p_t$ is the fair market price for the insurance (the "premium") that the existing bond holder would be willing to pay to avoid default. So, in short, the government provides the insurance but existing bondholders collect the premium from new buyers of the debt.[2]

A similar exercise can be done with equity pricing as well. Suppose the firm faces a constant and exogenous probability π of failing each period and pays a dividend d if it doesn't fail and 0 otherwise. Using a simple present discounted value formula applied to the dividend stream yields the equity share price

$$e_t = \frac{1-\pi}{i+\pi}d.$$

Once the bank is declared TBTF, default goes to zero and the equity price jumps to[3]

$$\hat{e}_t = \frac{1}{i}d,$$

which yields a capital gain of

$$\hat{e}_t - e_t = \frac{\pi(1+i)}{i(i+\pi)}d.$$

But what about the buyers of bank A equity *after* the announcement? As we can see, they paid a much higher equity price in response. Again, they are paying for the default protection.[4] The equity holders at the time of the announcement are the ones who reap the rewards of the TBTF status.

Now suppose the government chose to let bank A fail after this announcement and wiped out the equity holders and creditors. Well, the initial bondholders would not care. They received the insurance premium and sold the bond. They do not suffer. However, those who bought the bond at price $\hat{p}_t$ "paid" for insurance but did not get the promised payoff. They actually lose.[5] Hence, it is not surprising that they would be upset by the government's action. Who wouldn't be upset after paying for insurance that didn't pay off when it should have?[6]

A similar argument applies to equity holders. The initial stock holders wouldn't care. They reaped their capital gains by selling their shares to new buyers. But a shareholder who bought shares at $\hat{e}_t$ would again argue that they paid for the default protection. They would not be happy if they are told it's "fair" that they should be wiped out ex post. If someone held a share of bank A stock prior to the time of the announcement until the government allowed them to fail, then they would receive no capital gain and would be wiped out appropriately since they paid e_t not $\hat{e}_t$. This seems to be the view of those opposed to bailing out equity holders: that those holding equity at the time of bank A's failure were the same ones holding equity when the TBTF status was announced.

Moral hazard is a separate issue and an important one. But a similar logic applies. Bond holders care only about the default insurance. They do not reap the additional earnings from the riskier portfolio. Suppose the government sold a credit default swap (CDS) to potential buyers of bank A's debt. They would be willing to pay $\hat{p}_t - p_t > 0$ for the CDS and nothing more. Is this enough to compensate the government for taking on this risk? Most likely not, since under moral hazard the risk of default increases, say, to $\bar{\pi} > \pi$. But this is not the new bondholders' problem. It's a problem between the government and the equity owners.

For equity holders, moral hazard would imply bank management undertakes actions such that $\bar{\pi} > \pi$ and $\bar{d} > d$. If markets could properly assess this behavior in pricing bank A's changed risk structure, then the equity price would be

$$\overline{e}_t = \frac{1}{i}\overline{d},$$

which reflects the fact that the shareholders reap the higher dividend stream but the government absorbs the downside risk since $\hat{\pi}$ does not appear. As before, a new buyer of equity is paying for (i) the default protection and (ii) the higher dividend stream arising from moral hazard. So, yes, they receive the benefits of moral hazard in the form of higher dividend payments but they paid for it via the price they paid to acquire the stock. The problem once again is that the government absorbs the downside risk but isn't compensated for it by the equity holders at the time of the announcement. How severe the moral hazard problem is depends on its quantitative importance. And research is only now beginning to explore this.[7]

To summarize, the value of being designated TBTF is capitalized into the price of a firm's equities and its bonds. TBTF provides a windfall capital gain to shareholders and creditors at the time of the designation. But after that, new buyers of equities and debt are paying for that status. Consequently, determining who gets "bailed out" when an institution is TBTF is a more complicated task than it appears.

If the government is unable to commit to letting banks fail or breaking them up is not a serious option, then the best that can be done is compensate taxpayers for the default insurance it provides to large financial institutions. Minneapolis Fed President Kashkari has advocated turning the banks into financial public utilities and regulating them accordingly. An alternative may be to have the government sell CDSs against the debt of large financial institutions. Debt holders would then pay the government directly for this insurance. Having the U.S. government sell insurance is already a common policy: The U.S. government currently sells crop insurance, flood insurance, disability insurance, etc. So it is not unprecedented. While this may not solve the moral hazard problem, it at least compensates taxpayers for providing default insurance. ■

Notes

[1] The same logic applies to stock options of senior management. If the announcement of TBTF causes the equity price to jump high enough, then the strike price is below the market price of the stock, meaning senior executives are "in the money" and get a capital gain from their stock options.

[2] Another way to think about this is to assume the government issues a credit default swap. If it sold the CDS on the market it would receive the premium $\hat{p}_t - p_t$ from the buyer of the CDS. If default does not occur, the taxpayer makes a profit from the CDS; if default does occur, the taxpayer is on the hook for the loss. Now suppose the government gives the CDS to the existing bondholders and lets them sell it. The current bondholders get the premium as a windfall profit without absorbing any risk. Meanwhile, the taxpayer gets zero if no default occurs and is on the hook for $1 if default occurs. The buyer of the CDS is not bailed out—he paid the fair market price for the insurance.

[3] Since bond financing costs are lower, this would allow for a higher dividend payment after TBTF status is announced. Nevertheless, this is priced-in for new buyers of the equity.

[4] Again, senior managers who join bank A after the TBTF designation now face a higher strike price for their stock options, which effectively lowers their executive compensation.

[5] This applies even if the government could credibly remove the TBTF status of bank A.

[6] This line of reasoning also applies to many situations. For example, consider the mortgage interest rate deduction. Many argue that it is a subsidy to homeowners and should be eliminated. However, the deduction has now been capitalized into the price of the house so a new owner would actually take a capital loss if the deduction was removed. Again, new homeowners have paid for the subsidy and get very angry when elimination of the mortgage interest deduction is discussed.

[7] See Javier Bianchi's "Efficient Bailouts" (forthcoming in *American Economic Review*; https://www.minneapolisfed.org/research/wp/wp730.pdf) for an excellent attempt at quantifying the moral hazard problem in banking. Bianchi's main finding is that moral hazard is not quantitatively important if bailouts are systematic as opposed to being focused on a particular bank.

Posted on June 27, 2016