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Late on a Sunday night in September of 2008 the third largest investment bank in the US, Lehman Brothers filed for bankruptcy. The filing followed failed efforts to find a buyer for the company, an equity investor, or to convince the Federal Reserve to extend credit. The immediate cause was a “run” by private creditors who felt that Lehman no longer had adequate collateral to support rolling over their short-term loans. Similarly, the Federal Reserve argued that it could not legally assist Lehman because the value of the company’s assets did not provide sufficient protection for Fed loans.

Economist Lawrence Ball challenges the Fed’s position. In his book *The Fed and Lehman Brothers*, Ball argues that Lehman did have sufficient collateral to support Federal Reserve lending in an amount that would have prevented bankruptcy and that, by choosing to let Lehman fail, the Fed exacerbated the financial crisis and economic downturn that had been going on for the prior year or so.

According to Section 13(3) of the Federal Reserve code, the Fed can, “in unusual and exigent circumstances” lend freely against good collateral at a penalty rate. Unlike the situations of Bear Stearns a few months earlier, or insurer AIG a few days later, in the Lehman case the Fed determined that there was no legal basis to provide financing. Basically, the Fed’s position was that Lehman was insolvent. Insolvency may be defined in different ways, but the basic idea is that cash flow from assets is inadequate to meet debt obligations as they become due. A simple criterion for insolvency is that the market value of assets is less than the book value of debt, in symbols:

Insolvency Criterion: $MV(\text{Assets}) < BV(\text{Debt})$

Using Ball’s numbers, Lehman was very close to being insolvent on this criterion. The stated value of assets in the most recent accounting report (August 31, 2008) was \$600 billion. Total liabilities were \$572 billion, leaving equity of \$28 billion. However, it was widely believed that the true market value of assets was less than \$600 billion. Ball reports a range of estimates made by Lehman lenders and potential buyers, with the median estimate of fair value of \$568 billion. This would put the value of equity at negative \$4 billion, and the company would be insolvent. However, Ball argues that these valuations were based on stressed market conditions

at the time and that “fundamental” values were surely higher. Ball also challenges the validity of Criterion 1. Ball notes that \$115 billion of Lehman liabilities had maturities greater than one year and therefore were not subject to near term runoff. He proposes a second rule for adequacy of collateral to support short-term finance. This rule is that the market value of assets must exceed the book value of short-term debt:

Collateral Adequacy Rule: $MV(\text{Assets}) > BV(\text{Total Debt}) - BV(\text{Long-term Debt})$

On this basis Lehman had “excess” collateral of \$111 billion ($\$568 - (\$572 - \$115)$). Ball believes that the Fed and Treasury dropped the ball (pardon the pun) in the Lehman case, perhaps to set an example, and by doing so sharply worsened the crisis and associated economic downturn. The Fed’s primary role is to act as lender of last resort in a crisis environment and this they failed to do.

Had the Fed stepped in to stop the bleeding, Ball believes, the subsequent economic downturn would not have been as severe. He thinks it is very important to set the record straight that the Fed failed to perform its critical mission of lender of last resort.

I think it is uncertain whether Lehman was insolvent or not in the summer of 2008, but surely they were pretty close to it. The reason for that is that the company followed an extremely risky strategy of holding a highly leveraged portfolio including long-term and/or illiquid securities funded by volatile wholesale short-term funding. Although it may be true that it took a fairly serious negative event to trigger it (a “ten-year storm”), Lehman was a ticking time bomb.

We would hope that the lesson people take from this and other 2008 debacles is that the basic business plan was flawed. Lehman was highly exposed to a modern day “run” – a refusal by lenders to roll over short-term collateralized loans. That does not appear to be Ball’s primary takeaway. His main point is that the Fed should act in extreme circumstances to provide liquidity and enable gradual wind-downs of troubled financial companies (provided they are big enough to warrant concern).

Ball’s chief worry is that events subsequent to the crisis have **reduced** the Fed’s ability to step in as lender of last resort in a crisis. In particular, the Dodd Frank Act requires the Treasury to

agree with the Fed to provide assistance and eliminates the authority to structure tailored deals for specific situations (like those extended to Bear Stearns, Fannie Mae, Freddie Mac, AIG, etc.).

How to stop a run?

Certainly one way to stop a run is for the Fed to back stop everyone's liabilities. Mervyn King (former Governor of the Bank of England) proposes a variant of the current model wherein the Central Bank is obligated to lend against good collateral (be the "pawnbroker for all seasons"). In his proposal, the Central Bank designates the percentage of funding that it will provide against each class of a bank's pledgable assets. By adding up the percentage of funding multiplied by asset value across all assets, you get the maximum amount of Central Bank lending available to the bank (this is the Effective Liquid Assets or ELA). The bank is then responsible for ensuring that the aggregate of "runnable" liabilities (deposits plus short-term borrowings) is smaller than the ELA. This would generally require greater reliance on long-term financing than is the case today. In this regime, a run still could occur in which private lenders back away, but this would not lead to a crisis since the Central Bank would step in to provide liquidity.

Economist John Cochran proposes to eliminate the risk of runs in a very different way. He proposes a "narrow bank" concept in which any institution that accepts insured deposits is constrained to invest only in very low risk assets, like Treasury securities or bank reserves. The funding for risky assets would be entirely equity or long-term debt, not insured deposits or short-term borrowings. Cochran's solution would surely prevent runs. Some argue that the volume of financial intermediation might be subdued with negative consequences for economic growth. Perhaps, but the flip side is that the likelihood of massive financial market disruption and its sizable negative consequences for growth would also be sharply reduced.

Whatever the merits, there is little evidence of support for the Cochran proposal. If we continue down the current path, perhaps the King proposal deserves consideration. In order to establish the ELA for a given bank, the Fed would estimate values for all the asset classes that could serve as collateral for a Fed loan. How would it set these values? Generally, lenders are willing to lend a certain percentage of the current market value of an asset. The more liquid the asset, the greater is the lending percentage (one minus the lending percentage is called the "haircut"). For

cash, the lending percentage is 100% (and the haircut is 0%). For illiquid assets like commercial real estate, the haircut might be 50% or more. In a financial crisis, asset prices tend to decline. If the ELA amounts are established by applying pre-specified haircuts against **current** asset values, then the ELA will be declining in a crisis and there would be no assurance that Fed lending would stop a run. On the other hand, if the ELA is based on pre-specified haircuts against **book** asset values, then there is no assurance that the Fed loans will be properly secured.

I think financial regulators should aim to be counter-cyclical, not pro-cyclical. However, much of the current regulatory structure is pro-cyclical. One example is deposit insurance premiums that are often waived in good times (because the insurance fund is flush) and increased in bad times (when banks are suffering losses). Other examples include market value accounting and loan loss provision rules. In order to ensure that King's proposal is not pro-cyclical, the ELA should be based on book asset values. In order to ensure that Fed loans are properly secured, the haircuts should reflect stress or "worst case" economic scenarios. I suspect that rigorous application of these principles, had they been in place ten years ago, would have significantly constrained or curtailed the Lehman business and portfolio strategy.