

1 Introduction

One of the most insidious risks to banks individually and systemically is liquidity risk. A bank may be well capitalized, have good cash flow, and even be profitable. But a sudden draw on liabilities caused either by the withdrawal from a single large client or a systemic withdrawal by many smaller clients can render a bank insolvent regardless of these other factors. The Great Depression is a quintessential example of systemic liquidity events as the volume of money collapsed and banks did not have enough cash to meet demand. This paper will investigate the problem of liquidity risk including a brief review of current methods for measuring and mitigating liquidity risk. Additionally, we make two recommendations for advancing understanding and monitoring of liquidity risk.

2 Description of the Problem

Fundamentally, the problem of liquidity risk is the maturity mismatch between assets and liabilities at a bank. Banks make loans with maturities of duration averaging over two years [2]. Demand deposits can be pulled at any time, and bank's typically have a substantial amount of its liabilities in demand deposits. A liquidity event sparked by economic downturns or idiosyncratic bank performance may result in the bank not having enough cash on hand to meet demands. In this case, a bank has a number of options.

First, a bank may seek alternate sources of funding. Typically this involves pledging some of its assets as collateral. This funding can be private but is more frequently provided by regulatory bodies. For example, high quality loans can be pledged to the Federal Home Loan Bank (FHLB). The amount of liquidity that the FHLB can provide is reported to the Federal Reserve as part of Regulatory reporting.

Second, a bank may try to sell some of its assets. There is often a secondary market for bundles of loans. The most liquid is the market for mortgages. In fact, most banks sell most of their mortgage portfolio even without an immediate liquidity need. However, the fact that these secondary markets often dry up just as liquidity is needed the most makes this a risky strategy. Often the assets will be sold at a steep discount.

Third, a bank may try to sell itself to a stronger bank. Such a course is usually chosen as a last resort as the option often involves significant hardships to stakeholders. Wachovia stock dropped by a factor of ten from 2006-2008 before being acquired by Wells Fargo [3].

3 Regulatory approaches to mitigating liquidity risk

Regulators have varying sets of concerns in dealing with liquidity risk. The Federal Reserve is concerned with the safety of financial markets as a whole and is concerned with liquidity risk as it pertains to systemic risk. However, as the lender of last resort, the Federal Reserve can provide liquidity to any market that requires it. Hence its view of a financial institution's risk is holistic with substantial weight placed on credit and market capital. The Federal Reserve requires large banks to hold 10% of deposits in cash. The FDIC guarantees deposits up to \$250,000 and hence has liquidity risk in a prominent position. In the wake of the 2007-2008 recession, Basel III [5] requires an additional "liquidity coverage ratio" (LCR) to be calculated. This liquidity ratio contains two portions: the denominator is the bank's estimate of the net cash outflows for the upcoming month. The numerator contains the bank's investment in "high quality liquid assets" (HQLA). This ratio is required to be greater than one.

HQLAs are defined as assets that have low risk, low volatility, ease of valuation, and low correlation with risky assets. Further, the assets must be listed on an exchange and have a tendency to be considered a "high quality" asset in times of stress. A treasury bill is an excellent example of an HQLA.

The US implementation of the LCR splits HQLA into three buckets: level 1, level 2A, and level 2B [6]. Levels 2A and 2B require haircuts and constraints on how much they can contribute to the HQLA numerator. These rules apply to banks with over 250 billion in assets.

4 Industry approaches to mitigating liquidity risk

Most banks make use of qualitative and top down "holistic" approaches to liquidity risk. For instance, banks usually have a detailed contingency funding plan (CFP). This plan describes courses of action to respond to a liquidity event. The "capital" required to support this risk is held at the top of the house (usually in the finance department) and is applied as a blanket cost to all areas of the bank.

Banks have historically behaved in a manner suggesting lack of concern for liquidity risk. Competitive pressures force banks to convert excess low-earning liquid assets into illiquid assets. It is unlikely that this perceived lack of concern is actual. In the authors' experience senior management is very concerned with liquidity risk but has little choice but to accept this risk. In this sense liquidity is a classic prisoner's dilemma. It may be beneficial for everyone to hold more liquidity, but the incentive exists for everyone to hold less given that everyone else holds more.

5 Author's proposals

5.1 Criteria

The criteria for a successful measurement and management of liquidity risk is as follows:

- The measurement must be transparent
- The measurement must be intuitive to banking professionals
- The measurement must be comparable with other major risks (like credit, market, or operational)
- The management and modeling of liquidity risk should be applied to the same framework as other major risks (like credit, market, or operational)
- The measurement should lead to sensible and value adding business results

The first two criteria are self explanatory. Transparency and intuitiveness are a boon for regulators and stockholders; and in the case of large complex financial organizations likely a benefit to management as well. The third criteria is a corollary of the first two: liquidity risk should be managed in a similar framework as well-established risk management tools. The fourth applies mainly to economic capital modeling. The economic capital required to support liquidity risk should be able to be integrated into an economic capital model. Finally, the fifth criteria requires that the management of liquidity risk not be simply a regulatory or academic exercise but add tangible value and align incentives within a banking organization.

It is clear that current practices fall short of meeting the five criteria. Liquidity risk is held away from the other risks which does not allow for ease of integration or in aligning incentives. It acts as a burden to banks since it is an additional layer of regulatory capital. There is no subsequent improvement in monitoring or allocating liquidity risk since the capital is applied equally to every asset at the bank.

The regulatory rule on the LCR is a step in the right direction: it provides banks with a high level incentive to originate liquid loans.

5.2 Proposal 1

Liquidity risk should be managed using a bottom up approach similar to risk grades for “probability of default” (PD) and “loss given default” (LGD). These dual risk grades provide a quick and effective means of communicating the credit risk in a loan. Liquidity risk should be given a risk grade as well. A high quality

loan (say, a conforming mortgage) might be given a liquidity grade of one. A loan that is pledge-able to the FHLB may be assigned a liquidity grade of two or three. A loan with a plethora of non-standard features (say, a variable maturity or a floating rate tied to an esoteric benchmark) might command a grade of six or seven. Using a three pronged risk grade approach would provide a far more holistic view of the risk in a loan and would provide an immediate incentive to price and originate liquid assets starting at the loan officer level.

5.3 Proposal 2

The “capital” that is assigned to liquidity risk should have an intuitive dollar amount attached. An example of how to model liquidity risk in order to apply an intuitive dollar figure can be given by the example of Wachovia.

- Macro-economic stress: When Wachovia first started having financial problems, they were not the only bank to suffer. The 2008 downturn was in full effect and all banks were experiencing heavy losses
- Asset losses: Wachovia reported a nearly 9 billion dollar loss in Q2 2008 [4].
- Public panic: Depositors started pulling deposits, especially larger clients who had deposit balances exceeding the \$100,000 FDIC insurance that was available at the time. Wachovia lost 5 billion deposits in a single day [1].
- Idiosyncratic factors: While Wachovia was not the only bank to experience large losses, it was the only large commercial bank to become insolvent.

The modeling can thus be summarized distinctly as follows: asset losses exceeding expectations leads to increased public distrust. This may lead to deposits being pulled. In order to raise cash to meet obligations, the bank must then sell assets (often in a period where low quality assets such as a distressed bank’s portfolio are in low demand). Assets sold at a heavy discount result in more losses, which triggers a second round of panic; and so forth. Wachovia at the time of acquisition reported a 33 billion dollar loss [3]. The cycle is self-perpetuating and can lead to losses far exceeding any standard credit model’s economic capital allocation. The probability of these extremely large losses may be quite small since there have been only a handful of catastrophic banking failures in the last century.

Recent research has included liquidity risk in the computation of credit economic capital [7].

References

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