Two Heads Are Better Than One: The Neglected Usefulness of Market Information for Bank Supervision and Regulation

In a previous blog entry, I reviewed the evidence that bank supervisors' CAMELS (capital adequacy, asset quality, management, earnings, liquidity, and sensitivity to market risk) ratings reflect information about banks, including "soft" information that arises from knowledge that comes from examinations. In that blog, I summarized evidence that CAMELS ratings are useful for forecasting bank earnings and bank failure risk. But that evidence does not imply that examiners and supervisors always possess and make use of all the relevant information about banks' performance and stability. Markets are the quintessential aggregators of public information for publicly traded firms, including bank holding companies, which mainly reflect the operations of their bank subsidiaries. It turns out that market information contained in stock prices is particularly useful for gauging the likely future performance of banks, and their risk of failure, and unfortunately, this information is largely ignored by the current supervisory and regulatory processes that govern banks in the United States and elsewhere.

The KMV debt ratings model purchased many years ago by Moody's adopts basic finance theory to make use of observed stock market prices to gauge the economic value of the debt issuer's ratio of equity to assets and the volatility of asset values, which together are used to measure the firm's "distance to default"—an estimate of the likelihood that a debt issuer will default on its debts in the future. This distance-to-default measure serves as the basis for a bond rating (such as Baa1). The KMV model provided uniquely useful early warnings of the failure risks of Enron and WorldCom. This sort of information now is routinely used to gauge credit risk and debt ratings in the market, not just by Moody's Analytics, but also by many others who rate firms' credit quality.

Many economists, especially since the financial crisis of 2007–2009, have noted the usefulness of market information in forecasting bank performance and failure risk. While this has always been a theme in the academic banking literature, the 2007–2009 crisis experience provided strong corroborating evidence. Some banks that appeared well capitalized by regulatory accounting measures (which are based on the book value of equity relative to assets, or the book value of equity relative to "risk-weighted" assets) became distressed in 2008. Distress took the form of their inability to roll over their uninsured short-term debt and other obligations. The information contained in those distressed bank holding companies' stock prices—information

about their declining “economic” capital adequacy, and information about their activities’ relative riskiness—gave early warnings of their impending problems. But because the focus of regulation and supervision was on book values of capital, those early warnings were ignored by policy makers in the months leading up to the September 2008 crisis.

If supervisors and regulators had been tracking market information, in addition to other factors, they would have been more aggressive in requiring banks to replace their lost economic equity capital in the months prior to September 2008. If they had done so, the crisis likely could have been averted or minimized. That is the sense in which “two heads are better than one.” Supervisors (the “first head”) have access to information that markets do not have, which informs their supervision of banks. For example, if supervisors see problems in the cash flows of some line of business, or a rising loan delinquency problem, they can require the bank to reduce risk and increase capital to ensure that it can weather the storm. But supervisors may be missing important and useful information contained in market prices (the “second head”), which could inform timely actions to ensure banks are managing risk sufficiently and maintaining adequate capital to avoid failure.

Richard Herring and I (2013)[1] point out that the financial crisis of 2007–2009 did not happen overnight, and the collapse of many of the largest financial institutions in the fall of 2008 would not have come as a big surprise to anyone who was observing market measures of financial institutions’ declining health. We also show that whenever a major financial institution crossed a floor of about 2–3 percent of its economic value of equity capital relative to its economic value of assets, that institution experienced a crisis that caused it either to fail (e.g., as in the case of Bear Stearns in March 2008) or to be assisted by the government (e.g., as in the case of Citigroup in October 2008).

The deterioration in this economic value of equity to assets (the “economic equity ratio” for short) occurred over a long period of time. For example, Citigroup’s economic equity ratio was 14 percent in April 2006. It fell steadily from then to January 2008, when it was 6 percent. By June 2008, it was under 5 percent. By November 2008, it was 1 percent. Supervisors focusing on book value measures of equity, however, did not see the warning sign from this decline or understand the urgency of the problem (the shrinking distance to default of many large financial institutions) in the spring and summer of 2008 because their focus was on accounting measures of capital adequacy. As late as December 2008, Citigroup’s risk-based book equity ratio was nearly 12 percent, even though its economic equity ratio had fallen to 1 percent in November 2008.

Book equity ratios can provide incorrect measures of economic equity ratios for two reasons. First, and most importantly, book equity measures the difference between the value of tangible assets, such as loans or bonds, and the tangible liabilities of the bank, such as deposits. But banks are service companies, not balance sheets, and the economic value of a bank is based on all its cash flows, not just those associated with tangible assets and liabilities. Intangible assets capture the present value of fee-based income streams, and intangible liabilities capture the present value of expenses other than debt, such as leases or employee compensation. Both are reflected in market values. The shocks of 2007–2009 were associated with major changes that turned positive net intangible assets negative (Calomiris and Nissim 2014). Book equity ratios did not measure those changes. Second, accounting treatment of tangible assets can sometimes incorrectly value those assets, so that their true economic value can be less than the value recorded on the banks’ books. Huizinga and Laeven (2012) show that this was another

[1] See https://onlinelibrary.wiley.com/doi/abs/10.1111/jacf.12015

contributor to the difference between economic value and book value of equity during the 2007–2009 crisis.

Not all banks saw the extreme decline in their economic equity ratios that Citigroup, Bank of America, Bear Stearns, American International Group, Lehman Brothers, Merrill Lynch, and Morgan Stanley experienced. The 90-day moving averages of the economic equity ratios of banks that avoided distress—JP Morgan, Wells Fargo, The Bank of New York Mellon Corporation, State Street, Goldman Sachs, and many other institutions—never fell below 4 percent during the 2007–2009 period. In contrast, the 90-day moving averages of the economic equity ratios of the distressed institutions all fell below 3 percent. Similar patterns were visible in Europe. The distressed institutions that received substantial government assistance— Lloyds, Royal Bank of Scotland, UBS, ING, Fortis, and Dexia—all saw the 90-day moving averages of their economic equity ratios falling to below 2 percent.

While there are many opinions about what weight to attach to various government or private sector actions in precipitating the risk taking that led some financial institutions to experience large losses leading up to the crisis (see Calomiris and Haber 2014, chapters 7 and 8 for a discussion), none of those causes would have been sufficient to produce a collapse of the financial institutions that failed during the crisis had they not lost so much of their economic equity capital. Despite those losses, if the losses of equity capital that these institutions experienced from 2007 through mid-2008 had been replaced in a timely fashion, those institutions never would have suffered the economic distress we all witnessed.

In that sense, the most important policy error of the crisis was the failure of regulators and supervisors to require banks to replace lost capital quickly enough, especially in the spring and summer of 2008. The market for raising equity was wide open and much equity capital was raised from September 2007 to September 2008, but for banks that became distressed, the amount of capital raised was not nearly enough.

Applying This Analysis to the Largest U.S. Banks Today

What does market information tell us about the absolute and relative strength of the largest four U.S. bank holding companies today, and how different are the implications of those market opinions from the information contained in accounting measures, such as those same bank holding companies' (BHC) tier one capital ratios?

The first fact to note is that the ranking of the four BHCs in terms of their capital ratios is not the same if one uses book value measures as it is if one uses market value measures. JP Morgan Chase (JPM) has the lowest capital ratio of the four based on the so-called tier 1 book leverage measure at 6.9 percent, based on its fall 2020 quarter accounting. The other three largest BHCs displayed tier 1 book ratios of 7.1 percent (for Citigroup, C), 7.4 percent (for Bank of America, BOA), and 8.0 percent (for Wells Fargo, WF). But, as of October 2020, the economic equity ratio for JPM, at 8.9 percent, was the highest of the four. The comparable economic equity ratios for the others were: 7.7 percent (BOA), 5.6 percent (WF), and 5.0 percent (C).[2]

[2] For the sake of simplicity, this analysis abstracts from other loss-absorbing elements of capital, such as perpetual preferred stock, that can be included in tier 1 capital measures, and which are useful contributors to reducing bank default risk. Taking those into account would complicate, without fundamentally altering, the conclusions of this analysis.

What do these economic equity ratios tell us about the absolute resiliency of these banks? To gauge that, one also needs an additional piece of information: the perceived riskiness of the activities of each bank that could result in losses of equity. A standard measure of that risk is the "beta" of each BHC's stock price, which measures the covariance of a bank's stock price with the overall market. Using data from March through October 2020, the estimated betas of the four BHCs, in ascending order, are 1.3 (JPM), 1.4 (WF and BOA), and 1.9 (C). That implies that the BHC with the highest economic equity ratio (JPM) also has the economic equity ratio that is least sensitive to a market downturn (as could happen during a recession), whereas the BHC with the lowest economic equity ratio (C) has the economic equity ratio with the greatest sensitivity to a market downturn.

To be specific, using these data for the October 2020 economic equity ratios and the estimated betas, for Citigroup, a 25 percent cumulative market downturn would produce a decline in its economic equity ratio that would put it in the danger zone (below 3 percent), but for the other three BHCs, such a cumulative market decline would not cause their economic equity ratios to fall below 3 percent. This calculation is akin to a stress test based on market criteria, and closely parallels a more sophisticated stress test model developed at New York University's Stern School, which is known as the SRISK (systemic risk) model, because it captures the vulnerability of a bank's economic equity ratio to a systemic shock.[3]

Potential Policy Uses of Market Information in Supervision and Regulation

Economists have highlighted two categories of ways to improve supervisory and regulatory practice by incorporating market information relevant for gauging the risk of bank failure into supervisory practices: (1) make direct supervisory use of market information when measuring equity capital and risk, and (2) create new regulatory requirements, including one known as a contingent convertible debt (or CoCos) requirement that would automatically incentivize banks to respond to market-measured deterioration in their capital adequacy. The first of these would constitute a supervisory use of market information, where market information informs discretionary actions by supervisors. The second would go further by incorporating market information into the prudential capital regulation of banks.

If supervisors tracked the economic equity ratio and used it as a basis for requiring bank holding companies to raise new equity from the market (as their supervisory discretion allows them to do in principle), then supervisors could force banks to keep their economic equity ratios high enough to avoid a crisis. Specifically, they could incorporate these measures into their overall assessments of BHC and bank health and their conversations with bank managers, adding the economic equity ratio measure to their list of key early warning indicators. They could also use their supervisory discretion to respond to worryingly low levels of the economic equity ratio. For example, they might instruct BHCs for which a 25 percent downturn is likely to place them in the danger zone to increase their economic equity ratios by issuing new equity.

Why hasn't this approach to maintaining capital adequacy been adopted by supervisors in the United States or elsewhere? Some critics of the usefulness of the economic equity ratio question whether market values capture true economic values. In fact, during the last crisis, market value changes did an excellent job forecasting persistent economic value loss at financial institutions. But even if market value changes are an imperfect indicator of underlying

[3] See https://vlab.stern.nyu.edu/welcome/srisk for more details.

long-term economic value, they are still the most relevant measure to focus on for crisis prevention. If the market comes to believe that a large financial institution is insolvent, or nearly insolvent, then the market will also refuse to roll over its uninsured debts and obligations, and that institution soon will find itself in financial distress. In other words, market opinions are reliable signals of market crises, which is reason enough to pay attention to them.

Some economists have argued that supervisors are not powerful enough to use market information reliably to discipline banks (Shadow Financial Regulatory Committee, 2000). Banks often exercise an influential voice in debates about supervision and regulation and may successfully resist discretionary actions that would raise their capital requirements. When my coauthors and I were studying the United Kingdom's (U.K.) experience in setting bank-specific capital requirements prior to 2008 (Aiyar et al., 2014), we interviewed U.K. supervisors to ask why the largest banks had received lower minimum capital ratio requirements than other banks. Part of the answer, we were told, was that these banks would complain to the government if their capital ratios were raised, and their political clout meant that such complaints were sometimes successful in limiting supervisory discretion. This may be an isolated example, and I don't mean to suggest otherwise, but it is this sort of evidence that makes economists like the members of the Shadow Financial Regulatory Committee wary of relying alone on supervisory discretion to discipline large banks.

Still another answer may be that, as a matter of culture and training, supervisory agencies tend not to trust market measures. After all, economic research (for example, Behn et al., 2016) also has found that market-determined spreads on loans are the most accurate measures of risk weights (i.e., those that best forecast loan losses), but here, too, supervisors (including the Basel Committee) have consistently chosen to ignore loan spread information when setting loan risk weights for capital ratio regulation.

Partly in recognition of the political and cultural impediments to the supervisory use of market information, Herring and I (2013) build on similar proposals by others, such as Flannery (2005), to argue that it would be useful to codify a regulatory response to an inadequate economic equity ratio. They propose that large bank holding companies be required to maintain a minimum ratio of convertible debt (CoCos) that automatically converts into equity on a dilutive basis when the long-term moving average of the bank holding company's economic equity ratio falls to about 9 percent (a floor that is far above the insolvency threshold of roughly 2–3 percent). This would provide a powerful incentive for bank managers (a thermostat of sorts) to keep their economic equity ratios high, which would force them to replace lost capital in a way that avoid a repeat of the crisis of 2007–2009.

Of course, if politics and culture are impediments to greater reliance on market information, it is not surprising that proposals to make use of market information have not been enacted. To many economists, the failure to build market discipline into regulation has been a disappointing example of a failure to learn. While empirical studies show that supervisors are right to value their existing frameworks, including measures such as CAMELS ratings, evidence from the crisis of 2007–2009 also shows that those frameworks don't always provide reliable information about bank weakness in a timely fashion.

Can economists convince policy makers of the benefits of incorporating more market information into the supervisory and regulatory process? My own conversations with politicians, regulators, and supervisors over the past decade give me reason for hope, although economists still have a way to go making the case. In my view, the most useful thing we economists can do is to remind policy makers of what happened during the crisis of 2007–2009. After all, none of

us wants to see a repeat of the crisis experience, where reliance on book value measures of capital provided an unreliable and overstated measure of the economic value of capital in the wake of large, systemic bank losses of economic equity.

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