

Effective Regulation: Part 5 Ending "Too Big To Fail"

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Effective Regulation: Part 5

Ending “Too Big to Fail”



Global Markets
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Shielding taxpayers with contingent capital

The large increase in the range of institutions that were deemed to be “too big to fail” during the financial crisis, and the resulting expansion in the government-sponsored safety net that emerged, pose significant challenges to reforming the financial system.

Systemic regulation and a new resolution authority are two proposed solutions to these problems. Systemic regulation might reduce the frequency and severity of crises, but it is unlikely that crises can be eliminated entirely. In fact, systemic regulation might actually increase the risk of another crisis by encouraging risky behavior. Similarly, even a well-designed resolution authority could lead to more “bailouts” by making the resolution process easier and less expensive. Ultimately, reform must effectively eliminate the concept of “too big to fail” if it is to succeed.

One of the most promising proposals for substantially eliminating “too big to fail” is contingent capital. Structured as debt that converts into common equity when a firm is in financial distress, contingent capital is a form of self-insurance for systemically important firms. Correctly structured, it would force firms to recapitalize early and quickly, before localized problems could spiral into a systemic crisis.

How might this kind of capital work? A firm is deemed to be systemically important because it provides fundamental services, services so important and so intertwined with the basic structure of the financial system that stopping or even interrupting them could disrupt the economy. While these services must be maintained, the shareholders and bondholders of systemically important firms do not need special protection. Contingent capital allows a firm to continue to provide these essential services, even as that firm is recapitalized at the expense of its shareholders and contingent bondholders.

Back-tests indicate that contingent capital triggered by a process modeled after the U.S. “stress test” would have allowed the firms that were included in the stress test to recapitalize without taxpayer funds. The keys to making contingent capital effective are: (1) converting before the firm is insolvent; (2) using a broad definition of risk, including all off-balance-sheet items; and (3) applying a consistent, stress-based assessment of likely loan losses. Further, making conversion highly dilutive to existing shareholders has the effect of incentivizing both shareholders and the firm’s management to raise capital well before the firm reaches the mandatory conversion point. The back-tests also indicate that contingent capital could be more effective in improving financial firm incentives than a simple increase in regulatory capital requirements would be.

However, contingent capital could also be structured in ways that would make it ineffective or even dangerous. Standard regulatory capital ratios have proved to provide an inadequate early warning system for financial firms facing trouble. They would, therefore, be ineffective if used as part of a contingent capital regime. Additionally, conversion triggers that are based on market prices (rather than on comprehensive capital ratios) might actually exacerbate bank runs, rather than prevent them. So while the promise of contingent capital is great, it must be structured with tremendous care.

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Introduction: Solving “too big to fail”

It is unfortunately the nature of crises that both the time available to resolve problems, and confidence in the system’s ability to do so, are scarce. This combination often creates a domino effect, with one failure following rapidly on the heels of another, fueling systemic fears. This is why breaking the chain of failure becomes so important, and why firms that would have otherwise failed end up being rescued.

The greater the emergency and the faster the unraveling of confidence, the more dramatic such rescues need to be. In fact, overreaction on the part of policymakers is crucial to breaking the momentum of a crisis. And it is why, in crisis after crisis, there comes a time when key policymakers demand and receive overwhelming resources, whether in the form of extended authority or funds.

An equally inevitable problem, particularly after a crisis in which otherwise unviable firms are rescued, is the post-crisis review of fairness, moral hazard, the misuse of authority and the need to prevent similar occurrences in the future. This review speaks to the political and economic consequences of intervention.

The recent crisis raises two particularly challenging issues for reform of the financial system. First is the tremendous expansion in the scope of institutions deemed to be “too big to fail.” Second is the resulting increase in the size and scope of the government-sponsored safety net needed to break the chain of failure that naturally arises during times of crisis.

As regulators and policymakers seek to reform the financial system, it is important to reverse these trends. Otherwise, we may find that even after implementing truly positive changes, the next crisis is actually worse. Systemic regulation may reduce the number of crises, but it is hard to believe that they will be eliminated entirely. In fact, it could be argued that because investors and companies will be more confident in the abilities of a systemic regulator, they will be even more willing to engage in the risky behaviors that created systemic problems in the first place.

Similarly, while a well-designed resolution authority may make managing a crisis smoother, it raises the potential that “bailouts” become larger and more frequent, rather than smaller and less frequent. If it becomes easier and less expensive to deal with each problem institution, policymakers may be more willing to choose to do so. Mission creep for a resolution authority may be inevitable.

This is why some policymakers and academics are suggesting that a third-leg of reform is needed: large financial firms should be required to hold contingent capital.¹ The idea is quite simple: shareholders and contingent capital holders (a new type of bondholder) of a systemically important firm agree ahead of time that contingent bonds will convert to common equity if the firm’s capital falls below a specific threshold or some other identified “trigger” is breached.

¹ See U.S. Federal Reserve Chairman Ben Bernanke’s remarks to the U.S. House Financial Services Committee, October 2009; see New York Federal Reserve President and Chief Executive Officer William Dudley’s speech entitled “Some Lessons Learned from the Crisis,” October 2009; see Federal Reserve Governor Daniel Tarullo’s speech entitled “Confronting Too Big to Fail,” October 2009; see the Gordon S. Rentschler Memorial Professor of Economics and Public Policy at Princeton University Alan Blinder’s speech entitled “It’s Broke, Let’s Fix it: Rethinking Financial Regulation,” October 2009; see Goldman Sachs Managing Director Gerald E. Corrigan’s speech entitled “Containing Too Big to Fail,” November 2009; see the Bank of England’s Deputy Governor for Financial Stability Paul Tucker’s comments, November 2009; and see the U.K. Treasury’s piece entitled “Risk, Reward and Responsibility: The Financial Sector and Society,” December 2009.

Why might this kind of capital be effective? The reason a firm is deemed to be systemically important is because it provides fundamental services, services so important and so intertwined with the basic structure of the financial system that stopping or even interrupting them could disrupt the economy. While these services must be maintained, the shareholders and bondholders of systemically important firms do not need special protection. Contingent capital, if correctly structured, could allow the firm to continue to provide these essential services, keeping the economy safe, even as it is recapitalized at the expense of its shareholders and contingent bondholders.

The mechanics of this are relatively straightforward. A pre-insolvency capital “trigger” is set. If the firm gets into financial trouble, its contingent capital converts to equity capital, thereby recapitalizing the troubled firm. The alternative is that the troubled firm would have a window, perhaps of 30 days, in which to raise equity in public markets. If it chose not to, then its contingent capital would convert automatically. Depending upon the terms of that conversion, control of the firm might shift, inflicting significant losses on shareholders, but the firm would have sufficient capital to continue to operate. This helps protect both the economy and taxpayers by reducing the “too big to fail” problem.

This is not to say that the “too big to fail” problem can be eliminated entirely. While contingent capital could clearly allow troubled firms to recapitalize in periods of extreme financial stress, such as during the recent financial crisis, it is not possible to rule out all contingencies. Further, solving “too big to fail” only addresses the problem of how to recapitalize a failed firm in a functioning financial market. Regulators and central banks will continue to need to provide market liquidity in emergencies, and as needed, serve as a lender of last resort. This need will not go away simply because individual firms can recapitalize in periods of stress. No financial firm, regardless of how well capitalized it is, can survive if the financial markets themselves fail.

As contingent capital is considered as a means to reduce the “too big to fail” problem, it is important to understand that its effectiveness will depend on how it is structured, as well as a few other critical issues. First, the conversion “trigger” must operate quickly, so that recapitalization occurs promptly, preventing the firm’s management from further endangering the firm’s capital or the broader economy. Second, this trigger must be transparent, so investors can properly assess their risk exposure. Third, the quantity of contingent capital must be large enough to deal with a crisis, but not so large as to reduce the availability of credit and raise the cost of borrowing for bank customers to excessively high levels. Additionally, the terms of conversion must incentivize systemically important firms to be well-run and to act rapidly to correct problems, rather than encourage them to take excessive risk using their “too big to fail” status as a shield against market discipline.

In this paper, we discuss how to get a contingent capital regime right. Then we provide a “what if” analysis: how a well-structured contingent capital requirement, if it had existed, might well have averted the need for financial institutions to turn to government funds during the recent crisis. We end with an explanation of how contingent capital could be ineffective or even dangerous, if it is not structured with care.

A back-test indicates that a contingent capital requirement, if properly structured, could have kept all of the banks that participated in the 2009 U.S. Supervisory Capital Assessment Program (the “stress test”) from requiring direct government injections of capital. The back-test assumes that these firms could have accessed the various forms of liquidity support that were provided to the markets to keep them functioning. It also assumes that contingent capital would be equivalent to 6% of risk-weighted assets (RWA); that its conversion would be triggered by a process similar to the U.S. stress test, involving a capital-based and forward-looking analysis; and that it would convert, prior to actual insolvency, to common equity at a highly dilutive rate for existing shareholders.

As we discuss in this paper, the details matter, and a significantly different structure might not have been as successful. In the same vein, changes to financial supervision, including

increases in tier one common capital requirements, would almost certainly affect the ideal structure of a contingent capital regime.

Getting contingent capital right

There are several proposals being circulated on how best to structure and deploy contingent capital. The factors that are critical to the success of a contingent capital plan are: the triggers used for its conversion, the size of the shield it provides (e.g. the amount of contingent capital held), and the process and terms by which it is executed. Each of these factors interacts with each other in complex ways, but each also speaks to issues that are important from both a regulatory and an economic perspective. We provide a summary of the key issues related to these factors next.

“Triggers” and “prompt corrective action”

Perhaps the most common goal of bank supervisors is to be able to take “prompt corrective action” when problems arise. In practice, however, achieving this goal has tended to be more of a hope than a reality. This is because current rules make it easy to delay rather than to act. Shareholders prefer to delay, as there is always the possibility that the firm will heal itself without the dilution that accompanies recapitalization. Most customers also prefer to delay supervisory action, because they are usually protected by government insurance, and because troubled firms tend to be both eager to lend and willing to pay higher-than-normal interest rates. Even regulators worry that they will create significant disruptions, and that, by acting, they may be unfairly penalizing shareholders.

A well-designed trigger for the conversion of contingent capital can correct for these bad incentives, but only if a number of conditions are met. First, the trigger needs to operate *before* the firm is insolvent, so that shareholders are incentivized to protect the value of the remaining entity. Second, to ensure that the firm really is still solvent, the trigger must be based on an *accurate* and *comprehensive* assessment of capital (or another similar test of solvency) that measures the true health of the firm. This is one of the key lessons learned from the crisis: reported balance sheets proved to be entirely inadequate to assess the health of many financial firms. The full extent of capital shortfalls often did not become visible until all off-balance-sheet liabilities were accounted for and likely losses were recognized.

While other triggers should also be considered, the U.S. stress test provides a clear and reasonable blueprint for how to address this problem. The stress test forced all risks onto balance sheets; removed regulatory and accounting arbitrages; forced consistent loss expectations for all assets for the following two years; offset some of these losses by estimating conservative possible forward earnings; and, finally, calculated a two-year forward capital ratio for the firm. Because the stress test was run in this manner, it created a credible and comprehensive assessment of the true health of each institution in a stressful environment.

Such a stress test would provide a known process to the markets, which would make raising contingent capital much easier. Further, because much of the data from the stress test was made public, it provides enough information to test what might have happened had contingent capital with a stress-test-based trigger been in place during the crisis.

Shield size and terms

Part of the reason the conversion trigger is so important is that it determines how large a shield of contingent capital is needed. The shield should be large enough so that the firm can be recapitalized through the use of contingent capital, even in dire circumstances. The faster the trigger works, and the more accurate and comprehensive its assessment of the firm's health, the less capital will be needed to bring a troubled firm back to health.

A contingent capital shield is comprised of interest-paying debt that, when converted, turns into non-interest-paying equity. The structure of contingent capital could give triggered firms a window of perhaps 30 days, in which they could recapitalize in public markets. If they could not, or if they chose not to, then the contingent capital would automatically convert to equity. Once contingent capital converts, the firm has fewer liabilities. Further, because the firm stays solvent, its business counterparties are reassured that the firm will remain a going concern (assuming that the trigger is fast and the contingent capital shield is sufficiently large), meaning that there is far less incentive for the bank runs that often create crises.

The terms of conversion can also be used to enhance the stability of the financial system. If, for example, the conversion of contingent capital is sufficiently dilutive to current shareholders, then firms will raise new capital even in times of high stress, in order to avoid hitting the trigger. For example, even using very conservative assumptions, if the firms that were subject to the U.S. stress test had been required to hold a contingent capital shield sized at 6% of RWA from 2007 to 2009, a back-test indicates that every firm would likely have recapitalized voluntarily, so that contingent capital would not have been converted. Shareholders would have voluntarily suffered an average of about 50% dilution, but no government funds or government-assisted mergers would have been needed, and business would have likely been able to proceed without interruption.

The terms of conversion and size of the shield can also affect the cost of contingent capital. A highly dilutive conversion for existing shareholders can help make the cost of contingent capital more reasonable for financial firms. This is because contingent capital holders would likely demand a lower rate of return in exchange for a greater share of the firm in the event that contingent capital is converted. A prompt and comprehensive trigger can also reduce the cost of contingent capital, because the value of the firm is likely to be higher when contingent capital is converted. If, on the other hand, contingent capital is structured poorly, it may prove to be unreasonably expensive.

The ideal size of the contingent capital shield will depend in part on changes to financial supervisory regimes and capital requirements in the future. The back-test assumes a 6% of RWA tier one common capital requirement, as is currently the case. But it is entirely possible that financial regulators will require a higher level of base capital in the future. If so, and if firms accordingly have a stronger tier one capital cushion, then the ideal size of the contingent capital shield would likely be lower than 6% of RWA. The analysis also strongly suggests that the addition of a contingent capital layer may be more effective in improving financial firm incentives than increasing core minimum regulatory capital requirements.

Of course many other factors must be considered, including who will buy contingent debt and how regulators could roll-out a contingent capital plan. The devil will likely be in the details, and many of the answers to these questions will depend on changes to existing rules. That said, if the goal is to substantially eliminate the "too big to fail" problem, contingent capital does so by allowing systemically important firms to recapitalize at the expense of their shareholders and contingent bondholders – and not at the expense of the public.

Contingent capital in practice: the back-test

Richard Ramsden, head of U.S. Financials Equity Research, and Brian Foran, U.S. Equity Research Banks analyst, contributed to this section of the report, as well as Appendix A.

We show how contingent capital could work in practice by considering a counterfactual: what could have happened at several financial firms if contingent capital had been employed during the crisis in the manner we have discussed.

The back-test estimates net losses for these firms, and then determines if specific capital thresholds would have been breached. If such a threshold is breached, it poses two important questions: would the firm prefer to raise capital in public markets or allow contingent capital to convert instead? And, if contingent capital is converted, would a shield equal to 6% of RWA have been sufficient during the 2007 to 2009 crisis?

To answer these questions, a few key assumptions must be made. First, public capital must be assumed to be available at all times. We know all too well that this may not always be the case and that, in reality, some of these firms may have no choice but to convert contingent capital if public markets are unwilling or unable to provide the funding they require.

Second, it must be assumed that these firms would have had access to the various forms of liquidity that were provided to keep overall markets functioning. As we have noted, no financial firm, regardless of how well-capitalized it is, can survive if financial markets themselves fail. To that end, some proposals in circulation today would restrict the Federal Reserve's ability to lend in times of stress, and this would undoubtedly intensify the problems that arise in times of stress. If the Federal Reserve's power is sharply constrained in this way, then specific provisions for emergency liquidity or a minimum liquidity ratio would be needed in addition to contingent capital. (Regulators are clearly considering liquidity requirements, but this issue is outside of the scope of this paper.)

Third, it is assumed that these firms only raise enough capital to meet their minimum regulatory requirements. In reality, they are more likely to attempt to raise a larger capital cushion, which would reduce the need for successive capital raises. The firms included in the U.S. stress test, for example, raised 50% more capital than mandated.

Fourth, the back-test does not account for the fact that the discipline imposed by a stress test, as well as early capital raises, should have made these firms more likely to quickly curtail the activities that allowed losses to mount.

Lastly, the U.S. stress test is used in the back-test as a blueprint for how contingent capital could be designed: it is incorporated into the conversion trigger, capital adequacy thresholds, the treatment of off-balance-sheet risks and forward operating assumptions.

The back-test includes firms that suffered substantial losses: Citigroup, Merrill Lynch, Bank of America, Washington Mutual and Countrywide. It also examines firms that fared relatively well during the crisis: J.P. Morgan and Morgan Stanley. Each firm is considered on a stand-alone basis, as if no acquisitions had been made, so that we can better understand if and how they would have survived on their own if contingent capital had been in place. Bear Stearns and Lehman Brothers are not included in the study, because data are too limited.

The first step in the analysis is to determine how much capital might have been destroyed at each firm over the course of the crisis. To do so, we must take account of actual and estimated losses net of pre-provision earnings.

Let's consider Citigroup as an example. The company generated nearly \$120bn in losses, including write-downs and provisions, from 1Q2007 through 4Q2008. The 2009 stress test, which used data from the end of 2008 as a reference point, projected incremental losses for Citigroup of \$105bn over the following two years. This means that, in aggregate, Citigroup's losses could be about \$225bn from the start of the crisis through the end of

2010. Some of these losses could be offset by income. For example, the stress test projected that Citigroup could offset about half of its losses with income generated from 2009 through 2011. A tax shield would be applied to some of these losses as well.

When all of these factors are taken into account, Citigroup could generate net cumulative losses of just under \$115bn. As we noted earlier, if a stress test had been conducted throughout the economic cycle, Citigroup would have been more likely to raise capital early. This would have left it better capitalized, and should have made it more likely to quickly curtail the activities that caused these losses to build.

For companies that did not survive the crisis as independent entities, this analysis is a bit more complicated. For Washington Mutual, for example, we have to estimate potential losses and potential income based on the company's loan portfolio. For Merrill Lynch, for example, we know that the company generated nearly \$60bn in losses from 1Q2007 through 4Q2008, but we have to estimate the losses and income a stress test would have projected, using other investment banks as a model.

Once net losses have been determined, their effect on capital can be calculated. The process here is simple: net losses are subtracted from capital while net gains are added to capital. Remember that tier one capital consists largely of shareholders' equity, which is simply the market value of equity at issuance, plus any retained earnings, less any losses or dividends paid.

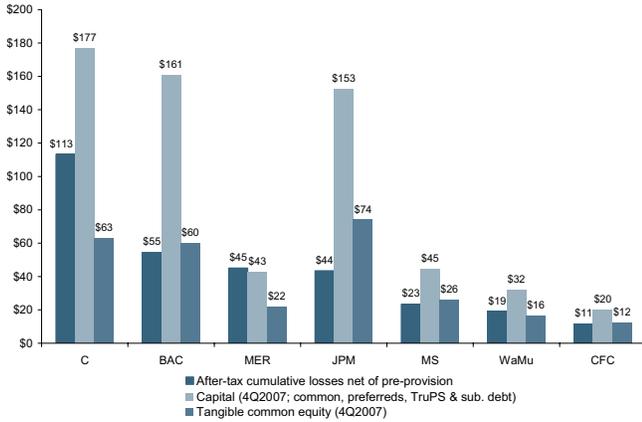
Next, it is determined if and when these systemically important firms would have breached specific tier one common capital thresholds. If such a threshold is breached, contingent capital would be triggered to convert to common equity. It is also assumed that the company could, as an alternative, have issued equity in the public markets at a 15% discount to its share price at that time. (We think this 15% discount is a conservative assumption, particularly given the prices at which these firms were able to raise capital after the stress test results were released, but we would also note that markets could have shut entirely, in which case the conversion would have been forced.) Where a share price is not available because a company was acquired, that price is estimated based on the performance of the U.S. Banks Index. A haircut is then applied to this estimate due to the likelihood that business would have continued to deteriorate after the acquisition was completed.

Each time a firm breaches its tier one common capital threshold, the back-test asks whether the firm would prefer to raise capital in the public markets or convert its contingent capital. Again, this decision will depend on which option is less dilutive to existing shareholders, and whether capital can actually be raised.

As we have already noted, the back-test considers a firm to have breached its tier one common capital requirement if this ratio dips below the current minimum requirement of 6% of RWA in the current quarter or below 4% of RWA based on a two-year forward stress test. Citigroup, for example, would have breached this 6% threshold in 4Q2007. At that time, it would have been less dilutive to raise capital in public markets to fill the capital gap. Citigroup would again have breached this 4% threshold in 1Q2008, 2Q2008 and 4Q2008. At each of these times, it would also have been less dilutive to raise capital than to convert contingent capital.

We provide some key conclusions for each of these firms in Exhibits 1 through 6, and walk through a specific example (Washington Mutual) in detail in Appendix A. If you would like greater detail for each of the companies included in the back-test, please contact us.

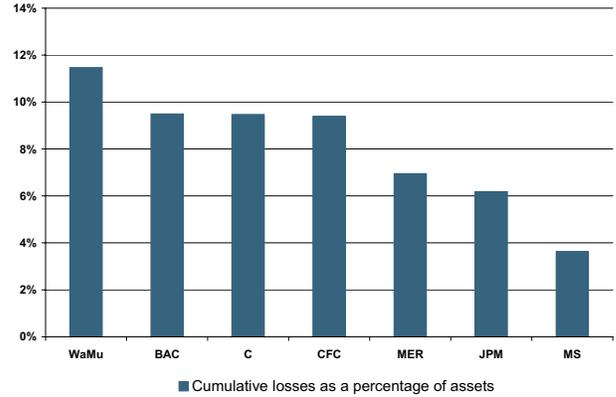
Exhibit 1: Net cumulative losses and capital levels
USD bn



* Cumulative losses are taken as percentage of 3Q2007 assets.

Source: Goldman Sachs Research estimates.

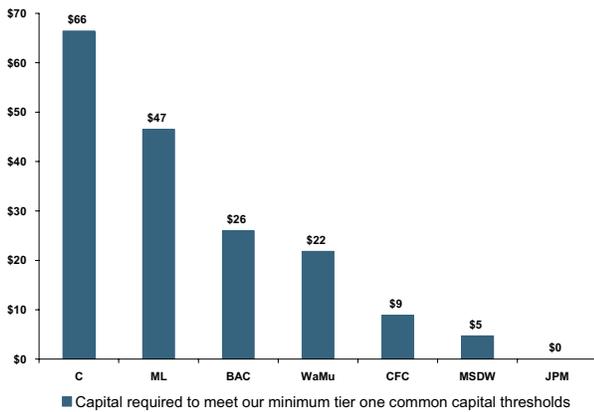
Exhibit 2: Cumulative losses as a % of total assets



* We use 35% tax rate in all of our analysis.
 * Estimated losses include write-downs and provisions reported.
 * Cumulative losses are taken as percentage of 3Q2007 assets.
 * WaMu actuals used from 1Q2007 to 2Q2008. After that based on JPM deal marks.
 * Countrywide actuals used from 1Q2007 to 2Q2008. After that based on BAC deal marks.
 * For Fed stress test pre-provision earnings, we use \$75bn for BAC. We estimate split between legacy BAC, MER and CFC.

Source: Goldman Sachs Research estimates.

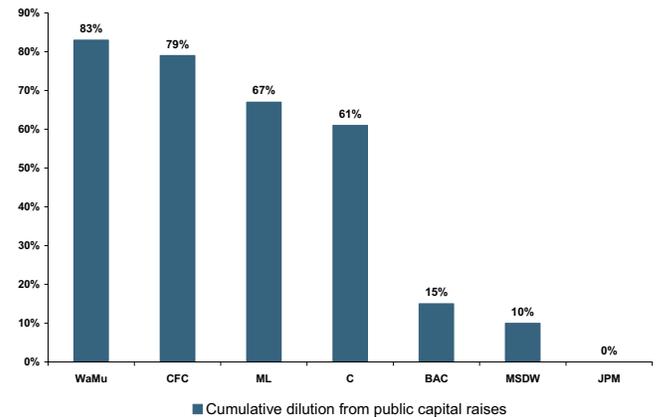
Exhibit 3: Additional capital needed to meet minimum tier one common capital thresholds in the back-test
USD bn



* How much capital each firm would have to raise to meet our 4% stress test or 6% current quarter minimum tier one common capital ratio threshold.
 * Remember that we examine each company on a stand-alone basis, as if it had never been acquired or made any acquisitions.

Source: Goldman Sachs Research estimates.

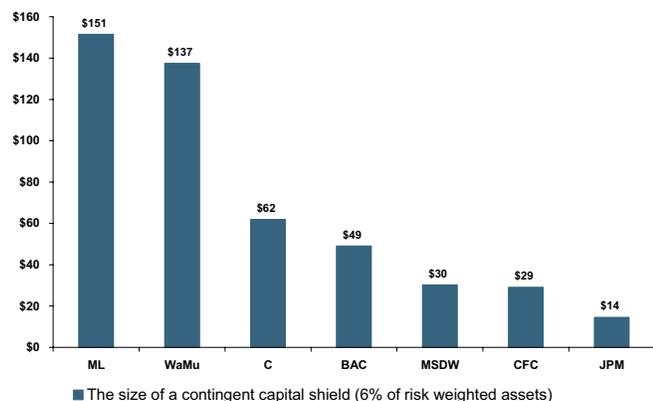
Exhibit 4: Cumulative dilution from raising public capital in lieu of converting contingent capital



* The numbers above represent the cumulative dilution existing shareholders would have faced at the start of the financial crisis, if each of these firms had opted to raise capital in public markets rather than allow contingent capital to convert. They would have elected to raise capital in public markets, assuming capital is available, because at any given point in time, it would be less dilutive than the 60% fixed dilution that occurs when contingent capital converts.
 * Recall that we examine each company on a stand-alone basis, as if it had never been acquired or made any acquisitions.

Source: Goldman Sachs Research estimates.

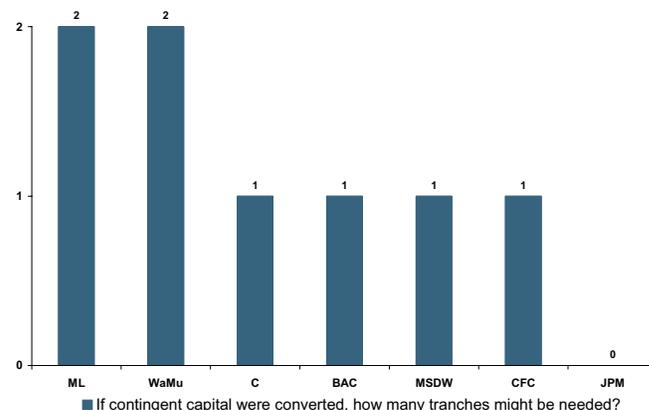
Exhibit 5: The size of a contingent capital shield
USD bn



* Above we show the total amount of contingent capital each of these firms would have held if they had a 6% of RWA contingent capital requirements. Remember, however, that we should suggest that this 6% shield be held in two tranches, each equal to 3% of risk weighted assets. The estimates above are based on risk-weighted assets as of 4Q2007.

Source: Goldman Sachs Research estimates.

Exhibit 6: How many tranches of contingent capital might each firm have had to convert during the crisis?



* Although we do not think that any firm would have elected to convert contingent capital during the crisis, we would note that if they had, a 6% total contingent capital shield would have been sufficient to recapitalize even the most troubled firms.

Source: Goldman Sachs Research estimates.

Varying the terms of contingent capital

Thus far we have shown that, under regulatory requirements as they exist today, a contingent capital shield sized at 6% of RWA would have reduced the “too big to fail” problem in the recent crisis. Examining what might have happened if the terms of contingent capital are different shows how important it is to get the details right. Next, we consider the potential consequences of getting the terms of contingent capital wrong.

The first important feature is a stress-test trigger. Some have recommended using regulatory capital-based triggers, but had such a trigger been used in the 2007 to 2009 period, it clearly would have failed. Publicly available data did not accurately convey the true reality of bank balance sheets: too much risk could be hidden off balance sheets; too much discretion was left to the reporting firms; and too little discipline in assessing forward losses was evident in the public numbers.

Market triggers are also being considered. They are technically very interesting, but they suffer from two critical flaws. First, they reflect no better information than do public accounting statements. Thus they may create incentives for managements to try to conceal problems from the market, hoping to earn their way out of trouble but potentially just exacerbating problems instead. Second, market-based triggers can easily create or intensify instability because of the way they are heeded in the market. For example, experience with similar “barrier options” (an option whose intrinsic value changes dramatically upon breaching a specific price level) suggests that the hedging associated with holding such options is likely to force a market trigger to be breached. Clearly a trigger should be pulled because a firm is at serious financial risk, not because of the hedging needs of its contingent capital holders.

One advantage of a capital-adequacy-based trigger is that it would provide these firms with a window in which they would have the opportunity to recapitalize in public markets; a market trigger is unlikely to be able to provide this kind of leeway.

The stress-test design is also attractive because it can be adapted to incorporate various other risks. One could imagine a battery of stress scenarios where firms are required to pass the 4% of RWA test all-in. The stress test also addresses the desire for a less pro-cyclical approach to bank capital standards. If the parameters of the test were held largely constant, losses would not be determined relative to current conditions but instead relative to the same stress levels, which would cause the firm to build up capital even in good times. Thus, while the original stress test represented a fairly substantial burden on both regulators and banks, repeating such a test quarterly in conjunction with regular reporting, based on constant parameters, could increase transparency, reduce the pro-cyclicality of capital and not represent an unreasonable burden on either regulators or financial firms. The stress test could also be updated as warranted to incorporate new products or risks.

While a single tranche sized at 6% of RWA would have worked in the back-test, there are advantages to having two tranches. Consider what would happen if firms were required to hold their contingent capital shield in two tranches, each equal to 3% of RWA. Even if one tranche were converted, the second tranche would still provide a capital cushion. Moreover, even though converting the first tranche would massively dilute existing shareholders, the continued existence of the second tranche (which would also be highly dilutive if converted) would maintain the pressure on (old and new) shareholders to address problems promptly. The second tranche would also likely price more favorably than the first, keeping the cost of contingent capital somewhat lower.

Additionally, it is worth noting that the conversion of even one tranche of contingent capital would immediately subject a firm to more stringent regulatory oversight. This is because the conversion itself would deplete the firm's capital below the regulatory minimum (although the conversion would add more tier one capital, in the form of equity, it would deplete tier two capital). This breach of regulatory requirements would give regulators the ability to take prompt corrective action and intervene as appropriate. It could also lead to the termination of existing management, if regulators feel that is the most appropriate course of action.

The back-test shows that a contingent capital shield of 6% of RWA would have been sufficient even in the worst banking crisis since the 1930s. Small changes to this structure clearly would not matter, but a significantly higher or lower number could be problematic. If the shield were much smaller than 6% of RWA, it might not be large enough to recapitalize firms in real distress. In that case, it would not offer real and credible protection, and it would raise the risk that government funds might ultimately be needed in any case. Alternatively, if the shield were much more than 6% of RWA, it could be too expensive for the issuing firm. This could lead to higher borrowing costs for bank customers and lower availability of credit.

Any future changes to supervisory practices, including an increase in risk-weightings and/or a change in the assets that can be considered as tier one capital, would affect the ideal size of the contingent capital shield. If the 6% of RWA contingent capital requirement had in fact operated in the context of an expanded capital base during the recent crisis, it would have been more than sufficient.

Lastly, the analysis indicates that making the conversion highly dilutive to existing shareholders would add substantially to the stability of the overall financial system in times of stress. The much increased likelihood that firms would recapitalize without direct government capital injections, and voluntarily choose to hold excess capital instead, is a clear and unambiguous positive. If shareholders knew that the mandatory dilution would be much smaller, they might be more inclined to allow conversion. This would lead to a greater government role (because regulators would be more deeply involved) and likely to greater government expense. The threat of losing control of the company should compel existing shareholders to seek capital in public markets as the better alternative.

Severe dilution has other advantages, beginning with a cost advantage. The higher the incentive to recapitalize in public markets, the lower the cost of the contingent capital to the issuing firm, as the likelihood of conversion is lower and the residual value of the firm upon conversion is considerably higher.

We would also note in passing that it would be quite natural to tie the voluntary decision to hold contingent capital to either the size of a firm, or the range of activities in which a firm engages, by allowing smaller firms to avoid the need to hold contingent capital by staying small, and not engaging in activities beyond narrow banking-related ones.

Conclusions

In summary, it is clear that correctly structured contingent capital could solve many of the problems associated with “too big to fail.” As regulators and policymakers seek to enhance the safety and soundness of the global financial system, it is important to consider that well-structured contingent capital could provide better incentives for financial firms to be well-managed than a simple increase in minimum regulatory capital requirements. However, it is also possible that contingent capital can be structured in ways that might make it ineffective or even dangerous, and so it must be designed and implemented with care.

Appendix A: Washington Mutual “what if” analysis

To show how the back-test was conducted, consider how it was employed for Washington Mutual (WaMu). Recall that the back-test examines WaMu as if it had never been acquired by J.P. Morgan (JPM).

First, the back-test estimates that WaMu could generate net losses of \$19bn from 1Q2007 through 4Q2010. This includes \$38bn in cumulative losses, which are estimated by assuming that 15% of the company’s \$250bn loan book is lost (this compares to the 12.5% loss estimate used by JPM).

Pre-provision income in 2007 and 2008, and an estimate of pre-provision income for 2009 and 2010 of \$8bn, are netted from cumulative losses. 2009 and 2010 pre-provision estimates are derived by taking a one-third haircut to the \$6bn average pre-provision income WaMu generated in the four quarters prior to its acquisition. A tax shield is applied to losses, but deferred tax assets are limited to 10% of tier one common capital.

In 4Q2007, WaMu had consolidated capital of \$32bn. Net losses from 2007 through 2010 would therefore have wiped out 60% of the firm’s capital (as of 4Q2007). See Exhibit 7.

If tier one common capital had to be above 6% of RWA in the current quarter, and above 4% of RWA based on the application of a “stress test,” WaMu would need to add \$22bn in capital from 2007 through 2010 to meet minimum capital requirements (see Exhibit 8).

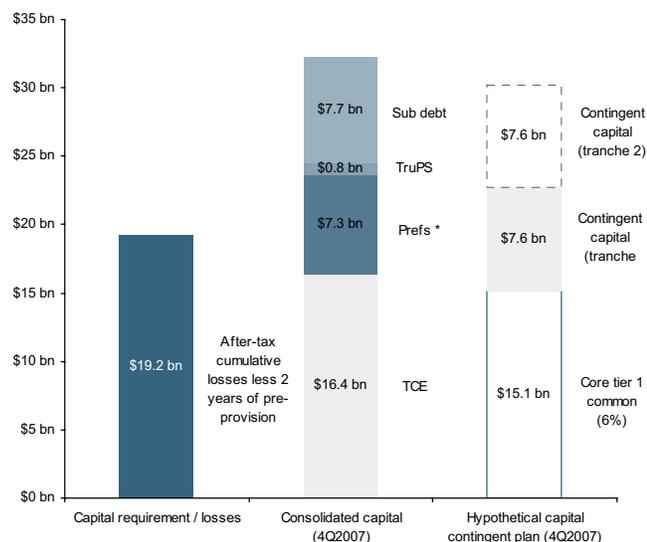
The firm must determine if it will convert its contingent capital to fill this minimum capital gap, or if instead it should raise capital in the public markets. For the purposes of the back-test, it is assumed that public capital can always be raised.

Contingent capital is assumed to be held in two tranches, each of which is equal to 3% of RWA. For WaMu, this means that each tranche would be \$8bn (based on 4Q2007 assets). If the first tranche is converted, contingent capital owners would hold 60% of the firm. If the second tranche is converted, contingent capital holders would gain another 30% of the firm.

In order to determine if WaMu would have elected to raise capital in the public markets, the company’s share price is estimated. For 1Q2007 through 2Q2008, actual share prices can be used. But for 3Q2008 through 4Q2009, the company’s stock price must be estimated because its shares were retired after it was acquired. The firm’s share price is estimated by applying the performance of the U.S. Banks Index. Then a 20% haircut is taken to that price, as it is assumed that business conditions at WaMu would have worsened more than they did at the other firms included in the Index. Another 15% discount is then applied to this price.

The company would likely have elected to raise public capital (see Exhibit 9), as dilution at any single point in time from a public capital raise would have been less than the 60% fixed dilution associated with converting one tranche, or the 90% fixed dilution associated with converting both tranches of contingent capital. That said, cumulative dilution from public capital raises would reach more than 80%.

Exhibit 7: Legacy WaMu losses and capital positioning
USD bn



*Including \$4bn of preferred stock at WMPF LLC, which is considered tier 1 capital.

Source: Global Investment Research estimates.

Exhibit 8: Legacy WaMu contingent capital scenario
analysis

USD bn; % of risk-weighted assets

	Simulated net income	Tier 1 common: "Do nothing" scenario	Contingent capital required	Tier 1 common: Contingent capital scenario
4Q07	-\$1.9 bn	8.5%	\$0.0 bn	8.5%
1Q08	-\$1.1 bn	7.6%	\$1.4 bn	8.2%
2Q08	-\$3.3 bn	5.4%	\$7.3 bn	9.0%
3Q08	-\$3.3 bn	3.2%	\$0.0 bn	6.9%
4Q08	-\$2.1 bn	1.6%	\$4.3 bn	7.2%
1Q09	-\$1.5 bn	0.4%	\$0.0 bn	6.0%
2Q09	-\$1.5 bn	-0.9%	\$2.6 bn	6.0%
3Q09	-\$1.8 bn	-2.4%	\$3.2 bn	6.0%
4Q09	-\$1.8 bn	-4.0%	\$3.1 bn	6.0%
Total	-\$18.3 bn	--	\$21.8 bn	--

* Not including \$7bn in capital raised at \$9 from TPG and other investors.

Source: Goldman Sachs Global Investment Research.

Exhibit 9: Legacy WaMu's estimated dilution from public capital raises
USD bn

	Share price	Additional capital needed	Shares issued	Shares outstanding	Dilution	Cumulative dilution
4Q07	\$24.6	\$0.0 bn	0	869	0%	0%
1Q08	\$15.3	\$1.4 bn	107	976	11%	11%
2Q08	\$9.3	\$7.3 bn	830	1,806	46%	52%
3Q08	\$8.2	\$0.0 bn	0	1,806	0%	52%
4Q08	\$6.4	\$4.3 bn	785	2,591	30%	66%
1Q09	\$3.3	\$0.0 bn	0	2,591	0%	66%
2Q09	\$3.6	\$2.6 bn	863	3,454	25%	75%
3Q09	\$4.1	\$3.2 bn	920	4,373	21%	80%
4Q09	\$4.5	\$3.1 bn	817	5,190	16%	83%
Total	--	\$21.8 bn	4,321	5,190	83%	83%

Source: Global Investment Research estimates.

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