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A Primer on Bank Capital

"Capital" is one of the most important concepts in banking. Unfortunately, it can be difficult for those outside the financial field to grasp, since there is no close analogy to capital in ordinary life. This primer is therefore intended to provide non-experts with a clear explanation of the basic facts about bank capital and a brief review of the related policy issues which are being debated as part of current proposals to reform the regulation of financial institutions. Although aimed at non-experts, this primer is also intended as a useful reference tool for more knowledgeable analysts. This paper will not make policy recommendations, but attempts a neutral explanation of the range of expert views. Those interested in the author's opinions can find them in various papers available at http://www.brookings.edu/experts/elliottd.aspx[1].

In its simplest form, capital represents the portion of a bank's assets which have no associated contractual commitment for repayment. It is, therefore, available as a cushion in case the value of the bank's assets declines or its liabilities rise. For example, if a bank has $100 of loans outstanding, funded by $92 of deposits and $8 of common stock invested by the bank's owners, then this capital of $8 is available to protect the depositors against losses. If $7 worth of the loans were not repaid, there would still be more than enough money to pay back the depositors. The shareholders would suffer a nearly complete loss, but this is a considered a private matter, whereas there are strong public policy reasons to protect depositors.

If bank balance sheets were always accurate and banks always made profits, there would be no need for capital. Unfortunately, we do not live in that utopia, so a cushion of capital is necessary. Banks attempt to hold the minimum level of capital that supplies adequate protection, since capital is expensive, but all parties recognize the need for such a cushion even when they debate the right amount or form.

The recent financial crisis demonstrated again the critical importance of bank capital. As a result, virtually all proposals to reform regulation of financial institutions aim to increase the amount and quality of capital in the financial. This primer will answer the following key questions:

The Basics

- What is capital and what role does it play?
- What counts as capital and why?
- Why are there different definitions of capital? When is each appropriate?
- How much capital does a bank need?

[1] I would like to gratefully acknowledge the support of the Pew Financial Reform Project and note that the views expressed are my own and do not necessarily represent those of the Pew Financial Reform Project.

- Why do banks not hold a large amount of extra capital?
- Who sets the regulatory requirements?
- What are those regulatory requirements currently?
- Why do capital standards vary around the world?
- How do bank standards compare to capital requirements for other financial institutions?
- What happens if a bank does not have enough capital?
- How much capital do banks usually carry over the regulatory minimum? Why?
- Do higher capital requirements always make banks safer?
- What has been decided about regulatory changes?
- What is the timetable for the remaining decisions?

Current Policy Issues

- Why are policymakers proposing higher capital requirements?
- What worked and what didn't work during the crisis?
- Will banks find a way to evade tougher requirements?
- What are the negatives of higher bank capital requirements?
- Should capital requirements vary over the business cycle?
- What is "contingent capital"? Is it a good idea?

The Basics

What is capital and what role does it play?

Capital, in its simplest form, represents the portion of the value of a bank's assets that is not legally required to be repaid to anyone. In more complicated forms, it can include portions of the value that do have to be repaid but only far in the future. Capital is intended to protect certain parties from losses, including depositors, bank customers, and bank counterparties. Any losses that occur would fall instead on the owners of the bank or occasionally some other party that is of lesser concern to those establishing the capital rules. Regulators and rating agencies are generally not directly concerned about losses ultimately falling on shareholders of the bank, since they have purchased the shares knowing that they share both the upside and the risks of ownership.

What counts as capital and why?

Capital comes in many varieties. The ideal form of capital has the following characteristics, which allow it to fulfill its role of protecting other parties by absorbing losses. Weaker forms of capital have most, but not all, of these characteristics or have all of them but in a weaker form.

- **It does not have to be repaid**. Any requirement for repayment reduces or eliminates the ability to absorb losses. However, some instruments are still considered capital because repayment is far in the future and therefore the loss absorption capacity is available as a practical matter for many years.

- **There is no requirement for periodic dividend or interest payments.** Dividend and interest payments would reduce the value truly available in the long term to absorb losses. Weaker forms of capital may have an expectation of periodic payments, but generally not an absolute requirement.

- **Low bankruptcy priority**. In bankruptcy or similar insolvency proceedings[2], claimants are paid out in a priority order depending on the nature of their claim. Capital provides the most protection to other parties if it ranks last. Some weaker forms of capital are not at the lowest priority, but still rank below the great bulk of claimants.

There are different financial instruments that can represent capital. The purest form is "common stock". Shares of common stock represent direct ownership of a company; if one owns 1 share out of 100 in existence, then one owns 1% of the company and is entitled to 1% of any profits that are distributed over time to shareholders. Common stock is the purest form of capital because there is no requirement to ever pay it back, nor is there a legal requirement to pay dividends. Common stock also has the lowest payment priority in bankruptcy, with the legal right only to receive any residual value after all other claimants are paid. It would be impossible to design a purer form of capital, as it fully meets the three tests listed above.

Preferred stock can also be considered capital. A preferred share is similar to a loan or a bond, in that there is a fixed claim on the assets of the company (a "redemption value") and an agreed dividend rate that is expected to be paid periodically. However, it is considered "stock" (and capital) because, unlike a loan, preferred shareholders have no right to force the company into bankruptcy if the preferred dividend is not paid. The only penalty for skipping a preferred dividend is that no dividends can be paid to common shareholders unless the preferred shareholders receive a full dividend. In terms of bankruptcy priority, preferred shares rank behind all other claims, except for those of common shares.

There are many variations of preferred stock, spanning the range from instruments that look more like common stock to ones that look more like debt. For example, there are participating preferred shares whose dividend rises if the dividend rate on common shares goes up. There are also perpetual preferred shares which never need to be repaid. Towards the weaker end of the capital spectrum, there are cumulative preferred shares which have the right to eventually receive any skipped dividend payments; no common dividends can be paid until the accumulated preferred dividends are paid out.

Generally, preferred shares are considered stronger forms of capital if they: are perpetual or have maturities many years in the future; are non-cumulative and therefore do not have the right to catch-up payments on any missed dividends; and are lower in bankruptcy priority than anything except common

[2] For explanatory convenience, I will generally use the term "bankruptcy" to cover all types of insolvency proceedings, even though banks in the U.S. normally undergo a special insolvency regime outside of the ordinary bankruptcy rules that apply to other firms.

stock. (There can be senior preferred shares which have priority above more junior preferred shares and are therefore weaker forms of capital.)

From certain vantage points, some kinds of debt are similar enough to preferred stock to count as capital, in a weak sense. Such debt is perpetual or has a maturity far in the future and is explicitly "subordinated" to other debt, meaning that it has a lower claim in bankruptcy. This is the weakest form of capital, since it contractually must be repaid and has the right to receive regular interest payments, enforced by the ability to put the company into bankruptcy. However, it does provide a cushion for depositors and other debtors, since, in bankruptcy, subordinated debt would be paid off only to the extent there were assets available after these other classes were paid.

At the other extreme, there is an even more conservative definition of capital than common equity. This is "tangible common equity," which is common equity minus the value of "intangible assets." Common equity is the total accounting ("book") value of assets minus the value of liabilities (everything that the company owes) and minus the value of any form of equity other than common stock, usually consisting only of preferred stock. That is, it represents the value of the assets minus everything that someone other than the common shareholders has a claim on. Importantly, this assumes that all of the assets should count at their book value. This includes intangible assets; ones that have value, but which are not either financial instruments or physical in nature[3]. The main intangible assets for corporations in general are copyrights and patents, brand names, and goodwill.

Most intangible assets at banks derive from the difference between the amount the bank paid in the past for another bank and the book value of the acquired bank's assets at the time of the purchase. The presumption is that the sales price represents the fair value of the bank, since it was arrived at in an arms-length negotiation, so intangible assets must exist that were worth the difference between the price and the book value. If these assets can be clearly identified, such as a copyright, then they are shown as a separate category of intangible assets. However, usually the great bulk of the value for a bank falls into the catch-all of "goodwill." The largest banks have grown through many acquisitions, so goodwill can represent a large figure for them. Goodwill and other intangible assets at banks generally decline in value over time and are "written down" to lower values on the books of the banks, but the writedowns proceed slowly enough on average that the major banks still have large quantities of intangible assets on their books.

Intangible assets usually represent genuine value, (such as the value to Coca Cola of its brand name), but investors recognize that they are particularly difficult to turn into cash in a crisis and that they can lose value if a bank's overall franchise deteriorates. For this reason, many investors prefer to treat them as worthless when evaluating capital adequacy. Such investors focus on tangible common equity.

[3] "Intangible assets" is a term of art in accounting which is quite difficult to define precisely in non-technical English. It excludes any physical assets or financial instruments, but does include the expected future profits from certain contracts such as mortgage servicing rights.

Finally, capital is sometimes referred to by non-experts as a "reserve" to protect against potential misfortunes. This is true in a general sense in plain English, but is not generally true in the accounting sense of the term. An accounting reserve is normally a liability put on the books to reflect the *expectation* of a specific future payment or loss, such as a loss on a specific loan or investment, not just the possibility that something could go wrong. In a few cases, accountants will allow a reserve to be set up for a general category of losses which are not yet specifically known. As explained later, these accounting reserves are sometimes counted as capital to a limited extent, since they are available to cover potential future losses which are not yet expected to occur.

Why are there different definitions of capital? When is each appropriate?

A key point about capital is that the relevant amount depends on where you are in the priority of repayment in the event of insolvency. **You only directly benefit from capital which is repaid AFTER you are or which is repaid as you are, thus sharing your loss.** Any part of the capital structure which has higher priority than you do has no direct value for you. Those other forms of capital may provide indirect value, such as by helping avoid insolvency or a bank run in the first place. However, if a bank does go off the rails, these indirect values count for very little.

This is why the government has focused on "Tier 1 capital", discussed below, which includes a fairly wide range of securities. The government's principal concern is to protect and reassure bank depositors[4], customers, and trading counterparties, who all have higher bankruptcy priority than the providers of Tier 1 capital. Common stock investors, who have the lowest repayment priority, have focused intensely at times during the recent financial crisis on the most conservative measure, tangible common equity. However, no party can afford to ignore those capital measures that matter to other key parties. Regulators have to watch tangible common equity, because they do not want shareholders to grow too concerned about any of the banks, and stock investors have to pay attention to Tier 1 capital, since this is the regulators' main focus.

There is one other benefit of common stock, and to a considerable extent, preferred stock – the ability to forego dividend payments. Skipping dividend payments allows the bank to build its capital base through retained earnings. This ability is strongest for common stock, because it is always understood that dividends are optional. Investors view preferred stock somewhat more like debt, so there is more of a stigma to skipping a dividend payment, even though it is legal to do so. Of course, when it is already apparent that a bank is in crisis, this stigma counts for little and preferred dividends tend to be skipped.

How much capital does a bank need?

There is no single correct measure for how much capital a bank needs, partly because it is a judgment call and partly because it depends on the viewpoint of the party making the measurement. Banks

[4] The Federal Deposit Insurance Corporation (FDIC) provides considerable protection, and therefore reassurance, to most depositors. To some extent the government's efforts to protect depositors amounts to an indirect protection of the deposit insurance fund.

generally look to maintain capital that equals or exceeds the maximum of four gauges described below. Thus, the most conservative key constituency determines the level of capital a bank will hold.

Regulatory capital requirements. Bank regulators[5] have set forth a series of capital adequacy tests for banks, explained below. These are the most binding capital requirements for banks, since they are legally required to pass these tests by holding sufficient capital or a series of regulatory actions will be taken that can ultimately result in the seizure of the bank.

Rating agency capital requirements. Ratings from Standard & Poor's, Moody's, and Fitch have an important effect on the cost of doing business for the largest banks and to a lesser extent for smaller banks. The cost of raising funds through issuances of debt instruments and preferred shares is considerably affected by credit ratings. In addition, the largest banks do a huge volume of sales and trading activities with some of their clients ("trading counterparties" or "counterparties") which create credit exposures to the banks for those counterparties. Counterparties insist on higher levels of collateral or better economic terms on the underlying trade if a bank has a lower credit rating. An important part of the determination of that credit rating is the capital adequacy as measured by the rating agencies. Thus, a bank will treat the capital level required to maintain its target credit rating as similar to the regulatorily required minimum capital levels, although not as binding. The general analytical approach of the rating agencies overlaps considerably with regulatory capital calculations, in part because the agencies factor into their analyses the likely actions of regulators. The two sets of approaches are sufficiently similar that this paper will focus almost exclusively on regulatory capital.

However, it is worth noting that the rating agencies treat financial instruments other than common stock differently from the regulators. Generally the rating agencies treat preferred stock or debt as having an "equity content" that ranges from 0-100% depending on how closely it matches the key characteristics of common stock. This equity content percentage determines how much capital an instrument provides for rating agency purposes. The total proportion of capital that is allowed to come from non-common stock sources is generally also limited, no matter what the equity content would otherwise be.

Investor-determined capital requirements. Under unusual circumstances, such as sometimes occurred in the recent financial crisis, banks may discover that participants in the financial markets view the right capital level differently from the regulators or the rating agencies. For example, at the turn of 2009 some of the big banks found that investors were deeply concerned about the level of their tangible common equity as a percentage of total assets. Banks could not afford to ignore this perception, even though it was not the primary focus of either regulators or rating agencies, so they took steps to enhance their tangible common equity ratios. Under more normal circumstances, common shareholders want their bank to be safe, but are willing to accept a higher risk of insolvency than other parties, because shareholders benefit substantially from employing less capital.

[5] Please note that the term "regulators" in this paper is intended to include the policymakers who set the high-level framework for the actual regulators.

Probabilistic economic capital requirements. Large banks also use complex models to forecast their financial condition under different potential scenarios. In general, they try to ensure that there is no more than say a 0.5% chance that they would find themselves insolvent in any given year. (They do not shoot for zero percent, because they cannot profitably function with the very low level of risk or very high level of capital that would be required.) Sometimes these tests will result in the need for more capital than suggested by the regulators, but more often they will produce a lower number. Unfortunately, the recent crisis pointed up many flaws in these models, which generally proved considerably too optimistic and sometimes skewed. Revised models may start to produce significantly different results going forward.

All of these measures produce some minimum required level of capital, accompanied by assumptions about the composition of that capital. Whichever measure produces the toughest capital requirements will normally be the binding constraint. In addition, a bank will try to hold a further buffer of capital above that minimum in order to give it time and flexibility if losses would otherwise have caused it to breach the minimum level.

Why do banks not hold a large amount of extra capital?

The problem with capital is that it is expensive, because it carries more risk for investors than debt securities or deposits. If capital were cheap, banks would be extremely safe because they would hold high levels of capital, providing full protection against even extreme events. Unfortunately, the suppliers of capital ask for high returns because their role, by definition, is to bear the bulk of the risk from a bank's loan book, investments, and operations.

If a bank were to hold 50% more capital than it really needed, it would generally have to earn higher profits in order to provide an adequate return to its larger capital base. These increased profits would have to come from some combination of higher charges for loans and other services and cost-cutting. Of course, the reduction in risk associated with the larger capital base should make capital providers and other funders willing to accept somewhat lower returns, but the net effect, in practice, would still be an increase in the total cost. In the real world, there are a number of factors that keep the required returns on capital from dropping as much as one might theoretically expect from an increase in capital levels. For one thing, the government's implicit and explicit guarantees make additional capital less valuable. To some extent, adding capital shifts risk from the deposit insurance fund or taxpayers to the providers of capital, as losses that would have been paid for by the insurance fund or a government rescue can instead be funded out of investors' capital. For another, interest payments are tax deductible for banks in the U.S. while stock dividends and share repurchases are not[6].

[6] Please see http://www.brookings.edu/papers/2009/0924_capital_elliott.aspx for a longer explanation of why the situation of banks differs from the classic Modigliani and Miller (M&M) theorems. M&M show that, under idealized conditions, the total cost of capital does not differ depending on the breakdown of the capital into stock and debt. If this applied in the case of banks, they would likely issue far more common stock to reassure regulators, rating agencies, and other parties.

Capital requirements are always a compromise between capital efficiency and bank safety. Policymakers and regulators do not wish to add a friction cost to lending transactions by requiring excess capital and the banks and their shareholders have little interest in earning lower ROE's.

Who sets the regulatory requirements?

Regulatory capital requirements in each country are set by some combination of the relevant governments and their banking regulators, who usually operate with a fair degree of independence. In the U.S., Congress created a framework for bank capital requirements in the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991. This framework specifies certain minimums, but leaves regulators the ability to establish tougher requirements and to take account of non-numerical factors such as an assessment of whether a bank is being operated in a safe and sound manner. The different U.S. banking regulators, such as the Federal Reserve Board (Fed), the Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (OCC) could theoretically use different standards. In practice, they have coordinated their minimum capital requirements in order to avoid encouraging regulatory arbitrage, a condition where business flows to entities regulated under the loosest standards.

Other countries allocate the responsibility for setting capital levels between the government and regulators in different ways, although the regulators usually do have significant leeway to set tougher requirements in all countries. The European Union, of course, coordinates these standards at the level of the EU as a whole, although changes to national law and regulation are usually required to put these standards into effect.

Several international bodies work to encourage globally consistent capital standards, in order to encourage financial stability in world markets and to minimize regulatory arbitrage across nations. One of these is the Basel Committee on Banking Supervision (Basel Committee), which is associated with the Bank for International Settlements (BIS), a coordinating organization for central bankers around the world. The Basel Committee has issued reams of technical standards over the years that are intended to be broadly adopted around the world. They are best known for their stewardship of the risk-based capital requirements.

The first round of those requirements was promulgated in 1988. This was originally known colloquially as the "Basel Capital Accord" and now is usually called "Basel I". These requirements were revised considerably in rules put forth in 2004, usually referred to as "Basel II." Unfortunately, the recent crisis brought to light a number of flaws. These are in the process of being corrected through extensive further technical revisions that will result in a "Basel IIA" or "Basel III." All of the recommendations of the Basel Committee are non-binding and do not take effect unless incorporated into national law and regulation.

The Financial Stability Board (FSB) is another global coordinating body. It was established in 2009 as a revised version of the Financial Stability Forum (FSF) which was itself set up in 1999 on the initiative of the finance ministers and central bankers of the G-7 club of major world economic powers. The FSF was

expanded and reformatted as the FSB at the behest of the larger G-20 club, a coordinating body for those countries that represent the great majority of the world's economic power. The FSB is mandated to help advise and coordinate international actions to protect the stability of the financial system. As such, it will doubtless present recommendations regarding capital requirements, even if only in the form of broad principles which leave the detailed decisions to the Basel Committee and individual national regulators. The G-20 itself has provided guidance to the FSB about certain broad principles to be considered in reforming rules for the financial system. These include the avoidance of abrupt actions to raise capital standards which could exacerbate the existing credit crunch and also the consideration of ways to avoid having capital standards act pro-cyclically to create credit crunches in the future.

What are those regulatory requirements currently?

Basel I defined two tiers of capital, a distinction that was retained in Basel II and will remain in the next round of revisions. "Tier 1," the strongest, consists mainly of common stock and those forms of preferred stock that are most like common. "Tier 2" adds in certain types of preferred stock that are less like common stock and more like debt, as well as certain subordinated debt securities. In addition, it includes some accounting reserves that provide a protective function similar to other forms of capital[7]. The two tiers are intended to ensure that there is enough total capital available to handle even extreme occurrences and that the bulk of this capital is the stronger "Tier 1" variety. Generally, banks have plenty of Tier 2 capital, so the practical focus has been on ensuring there is enough of the stronger, Tier 1, form of capital.

The Basel calculations include a number of deductions from the stated balance sheet figures for capital. First, and probably most importantly, the Basel agreements require the deduction of goodwill, effectively treating it as worthless for these purposes. Second, individual national regulators have chosen to fully exclude or to limit the amount of certain other accounting assets. For example, U.S. regulators limit the portion of deferred tax assets that may be counted in equity, since the value of those assets would only be realized if a bank makes future taxable profits, which may not occur if it runs into the kind of trouble that makes capital important.

Regulators in the U.S. measure capital adequacy in part by looking at the ratio of Tier 1 capital to "risk-weighted assets," (RWA.) RWA is the risk-weighted total amount of assets held by the bank. That is, the total value of each asset is multiplied by a percentage reflecting its risk level and this adjusted amount is added across all assets to produce a total risk-weighted asset figure. The percentage weighting for each category ranges from 0%, for extremely safe investments such as cash and US government securities, to

[7] Tier 2 capital includes five broad categories. First, some countries, but not the U.S., allow "undisclosed reserves" that are effectively the same as retained earnings, but are separately accounted for. Second, some countries allow certain assets to be held at historical values that can be well below current market values. Some or all of the difference between current and market values would be held as a "revaluation reserve." Third, general loan loss provisions may be held which are not allocated to specific claims and are therefore available to absorb any unexpected losses. Fourth, certain "hybrid debt capital instruments" are considered to have enough of the aspects of common stock to be considered Tier 2 capital. Fifth, subordinated debt instruments with at least a five year maturity are allowed to count as Tier 2 capital to a limited extent.

100% for riskier classes of assets. In a few cases, the levels exceed 100% for certain very risky assets, such as loans in default or imminent danger of default and the riskiest tranches of securitizations. Commitments to lend that are not carried on the balance sheet are converted to an asset amount using weightings that depend on the type of commitment, with those that are certain to be drawn down receiving 100% weightings. These asset-equivalent amounts are then treated as if they were already on the balance sheet, with their effect on total RWA depending on the riskiness of their type of credit.

For example, residential mortgage loans often have a 50% risk-weighting, so that a $1 million mortgage would generate a risk-weighted asset of $500,000. If a bank were trying to hold capital equal to 10% of its RWA, then it would need $50,000 of capital to cover this mortgage. If instead of making a loan immediately, the bank made a commitment to lend in the future should the homeowner wish, then the $1 million commitment might be treated as equivalent to, say, a $750,000 loan. After applying the 50% risk-weighting, this would produce an RWA of $375,000 and a need for capital of $37,500.

Those banks that have significant trading books use a different set of rules to determine the capital needed to back those trading positions. These calculations attempt to capture both the overall market risk of different types of securities and the specific credit or other risks that apply to particular securities. Market risks are calculated based on a "value at risk" (VAR) formula that looks at the historic distribution of price movements. The idea is to use the level of loss from an unlikely severe market movement, such as one that occurs only 1% of the time in the chosen historical period, and then to multiply this by a factor to add further conservatism. As discussed later, the specific techniques and weightings used under Basel II are now viewed as unsatisfactory in light of their performance in the recent financial crisis and have been revised to be considerably more conservative.

The ratio of Tier 1 capital to RWA is required to be a minimum of 4% to be considered "adequately capitalized" and must be at least 6% for a bank to be considered "well capitalized." Banks that are not well capitalized have a number of regulatory restrictions which create strong incentives for a bank to remain well capitalized. Generally, banks aim to have a ratio of at least 8% of Tier 1 capital to risk-weighted assets. After the recent crisis, many banks are aiming for even higher levels.

U.S. bank regulators also require that banks maintain sufficient capital to meet a "leverage ratio" test, which is measured simply as the amount of Tier 1 capital divided by total assets, without regard to risk weighting, averaged over the period. This test, which appears almost certain to be added to most national regulatory regimes in the next few years, is discussed in greater detail later.

It is important to note that all of these capital tests are balance sheet tests, based on the level of assets, liabilities, and capital in existence at the time of the test. This has two key implications. First, the accounting figures determine the test results. Thus, the aggregate value chosen for so-called "toxic assets" currently has a significant impact on reported capital levels. Banks, in consultation with their accountants, choose a point estimate of the value of these distressed mortgage-related securities from within a range of values that could be supported by the known facts. Regulators can push for more

conservative estimations, but their ability to force this matter is somewhat limited, given that the accounting rules do allow considerable leeway.

Second, the standard tests are not forward-looking. Regulators may ask for scenario analyses looking at how the economic situation might unfold, but it can be difficult under normal circumstances for them to push the banks too hard to add capital based on those hypothetical cases.

Given the extraordinary circumstances of early 2009, including the likelihood of further severe effects from the recession, the Administration and the bank regulators concluded that there needed to be a forward-looking component of capital requirements. Therefore, the government created an additional, temporary, layer of capital requirements, based on a "stress test." The test was intended to ensure that banks would have sufficient capital even if the economy were to deteriorate substantially more sharply than the consensus of forecasters already anticipated[8].

It seems likely that there will be increased regulatory use of stress tests going forward, but these may be applied in an ad hoc manner, rather than becoming a main part of the capital requirements.

The capital standards discussed to this point have focused on asset risk, since this is the predominant risk facing banks. However, regulators around the world also take account of operational risks in setting capital requirements. In particular, the Basel II rules have a number of explicit capital calculations to attempt to capture operational risk. U.S. regulators have not adopted this portion of Basel II and consequently do not use those calculations. In particular, operational risk for U.S. banks is not explicitly included in the formulas for calculating minimum capital requirements, although it could drive a subjective upwards adjustment in capital requirements at the discretion of the regulators.

It should be emphasized that the regulatory capital calculations are viewed as only one of three pillars supporting bank safety. Basel I and II also explicitly recognize the importance of "Pillar 2," the supervisory review process by regulators, and "Pillar 3," market discipline based on transparent accounting information.

Why do the standards vary around the world?

There are two straightforward reasons why there are no binding global standards. First, capital rules are the product of government legislation and regulation and we have neither a world government nor world regulators. The individual governments that do exist do not always see eye to eye, particularly on the details. Second, capital rules need to be appropriate for the financial systems of the relevant countries and these systems differ significantly in practice. This is most obvious when comparing advanced financial systems such as that of the U.S. with those in developing economies such as China.

[8] Please see "Bank Capital and the Stress Tests,"
http://www.brookings.edu/papers/2009/0303_bank_capital_elliott.aspx
for a further explanation. Additional papers on the results of the stress test are available at
http://www.brookings.edu/experts/elliottd.aspx

However, there are significant differences even between advanced financial systems. For example, banks are considerably more important credit providers than are financial markets in most of Europe, while markets have generally supplied more of the credit in the U.S. than banks have. As another example, one reason that the Canadian financial system has held up much better than many others in the recent crisis is that the mortgage business is run much more conservatively there, partly due to stricter legal constraints on mortgages. The implications of these various differences for the required levels of capital are too complex to be described here, but it is important to recognize that differing institutional and economic frameworks matter in determining what should count as capital and what levels are needed.

How do bank standards compare to capital requirements for other financial institutions?

Capital standards differ sharply across types of financial institutions, particularly when viewed on a global basis. In the U.S., capital standards for bank holding companies and for investment banks are fairly similar to those for commercial banks, but standards for insurance companies differ strongly, and there are effectively no regulatory capital requirements for mutual funds, hedge funds, and pension funds. These differences produce the potential for significant regulatory arbitrage over time, as business flows to the entities with the weakest capital requirements for a given type of activity. However, it must be noted that capital levels often *should* differ between different types of institutions, given their varying customer bases, asset and liability structures, risk exposures, etc. The potential for harmful regulatory arbitrage arises only when similar risks are arbitrarily treated differently between regulatory regimes.

Most commercial banks in the U.S. are owned by parent companies known as “bank holding companies.” These holding companies are generally subject to capital requirements on the consolidated activities of themselves and their subsidiaries that are quite similar to the rules for banks. One of the main differences is that current regulatory enforcement powers over bank holding companies are significantly weaker than for banks. This may become much less of an issue due to proposed changes incorporated in the current round of financial regulatory reform legislation that would make enforcement powers for banks and bank holding companies more consistent.

As a result of the recent crisis, the major investments banks in the U.S. are all affiliated with commercial banks and therefore fall under the consolidated bank holding company capital requirements. (The parent companies, which may do considerable business directly, are bank holding companies because of their ownership of a commercial bank. The activities of any direct or indirect subsidiaries are pulled into the calculations as a result of accounting consolidation.) In addition, the Securities and Exchange Commission has imposed certain capital requirements on investment banks based on Basel II. These proved unsatisfactory in the crisis and are being altered as part of the current reform efforts.

Capital requirements for insurance companies have some common elements with bank capital requirements, but many differences. Insurance regulators use risk-based capital calculations that are analogous to the RWA calculations for banks, except that they take into account a much wider range of things that can go wrong. Insurers can go broke because their assets go bad, because they have

mispriced the risk they took on, because the expected levels of insurance claims are wrong, etc. By contrast, the risk for banks is much more concentrated on the asset side. Even liquidity concerns tend to be manageable if the assets are clearly still good, especially given the existence of deposit insurance, the ability to access the Fed's discount window, and other government-sponsored supports to prevent bank runs on solvent institutions.

Insurance capital calculations also take account of the low probability that insurers will be simultaneously wrong on all these diverse risks. For example, mortality rates are unlikely to move in tandem with asset prices and certainly would not be perfectly correlated. A complicated formula is used to reflect this less than 100% correlation.

More fundamentally, regulatory capital requirements are much less important for insurers than for banks, because the rating agencies are commensurately more important. Insurers are regulated on a state-by-state basis in the U.S. and each state has a guarantee fund intended to cover policyholder losses caused by the insolvency of an insurer. However, the funds are somewhat patchwork in nature and have not reassured policyholders and their insurance agents to nearly the same extent as the FDIC's insurance protection has comforted bank depositors. As a result, insurance buyers and their advisors care a great deal about the creditworthiness of insurers and look at credit ratings as the most reliable guide to that creditworthiness. The large insurers therefore strive hard to have Triple-A or Double-A claims paying ratings from the agencies. Historically the rating agencies have required three or four times the minimum capital levels demanded by the regulators in order to earn such ratings. Therefore, rating agencies have become the de facto capital regulators for most of the insurance industry.

That said, the analytical approach of the rating agencies to capital levels is quite similar in concept to the regulatory approach, except that they demand significantly higher levels for the top ratings. In addition, the agencies use significant subjective judgment about business strategy, quality of management, and other factors that are not reflected in the regulatory formulas for the insurance industry in arriving at their ratings.

Finally, there is also another set of financial institutions that have essentially no regulatory capital requirements. These include mutual funds, hedge funds, and pension funds, which are all significant providers of credit to our economy. There are literally no regulatory requirements that they maintain any particular level of capital. One might argue that pension funds have such a requirement through government-mandated funding rules, but the funding rules really only mean that over time they have to have assets equal in value to their pension promises – essentially a 0% capital requirement. In practice, they can be underfunded for long periods, effectively operating at negative capital levels.

What happens if a bank does not have enough capital?

The consequences for a bank of holding too little capital depend on which standard of capital they fail to meet. Regulatory capital requirements have distinct penalties, described below. Rating agency "capital requirements" simply mean that a bank's credit rating might fall, with business consequences but no direct legal requirement to take action. Failure to meet an ad hoc standard that other investors may

develop, such as was implicit in the focus early in 2009 on tangible equity ratios, would similarly have business consequences, such as a lower stock price or a difficulty raising debt at reasonable rates, but would not legally force action.

The consequences of failing to meet U.S. bank regulatory capital levels are fairly clearly defined in FDICIA, the law that set up the "prompt corrective action steps" that are a cornerstone of the power of regulators to force changes at banks. When a bank first becomes undercapitalized, it will be ordered to promptly take certain corrective actions to restore acceptable capital levels. The initial requirements are not onerous, but the failure to execute those steps, or further significant drops in capital, lead to increasingly tough actions. At the extreme, bank regulators can seize the bank even though it may be solvent from an accounting point of view on an appropriately conservative basis and may be current on all payments. (This is a major difference from normal bankruptcy rules that apply to non-banks. A regular corporation cannot be forced involuntarily into bankruptcy unless it has missed contractually obligated payments.)

Table 1 shows the thresholds used to determine whether corrective actions are necessary and the urgency and severity of the needed responses.

Table 1: Regulatory capital levels in the U.S.

	Tier 1 to RWA	Tier 1 and 2 to RWA	Tier 1 to Total Assets (leverage ratio)
Well capitalized	6%	10%	5%
Adequately capitalized	4%	8%	3 or 4%
Undercapitalized	Fails to meet one or more of the tests to be adequately capitalized		
Significantly undercapitalized	3%	6%	2%
Critically undercapitalized			2%

Banks that meet all three of the tests to be considered "well capitalized" do not face any regulatory limitations tied to capital. If their capital fails to meet any of the three tests, but meets all of the tests to be considered "adequately capitalized", then the bank starts to face regulatory constraints. Certain approvals, such as for acquisitions of other banks, would face higher hurdles than for a well capitalized bank. Perhaps more importantly, a bank that is not well capitalized cannot accept brokered deposits without a waiver from the FDIC, which can be hard to obtain. Such a bank would also face restrictions on the interest rate that it can pay on deposits, which generally cannot be more than 75 bps above the average for other banks.

Failure to be "adequately capitalized" by any of the three measures triggers significantly stronger requirements. Most basically, the bank must submit a plan to its primary federal regulator showing how it will restore adequate capitalization. The plan must be convincing enough for regulators to approve it and the bank must follow through within a reasonable period of time by restoring adequate capitalization. Failure to submit the plan, have it approved, or effectively executed results in much more onerous regulatory actions, similar to those described below for "critically undercapitalized" institutions.

While a bank that is not "adequately capitalized" is preparing a plan and during the process of executing it, regulators may impose a number of other restrictions and requirements. These include: the inability to make dividend payments or repurchase shares without explicit permission from the regulators, which is unlikely to be given easily; a requirement to submit to close monitoring by the regulators; and restrictions on asset growth or certain business activities.

A bank that becomes "significantly undercapitalized" by any of the three measures faces the same set of potential restrictions, but with a higher probability that regulators will enforce all or many of the restrictions. In addition, regulators may place restrictions on transactions with affiliates and may require changes to the management team in whole or in part.

"Critically undercapitalized" banks are required to take steps very quickly to remedy their capital problems. In addition to the restrictions applicable to all undercapitalized banks, they may not make payments on subordinated debt. Most importantly, there is a presumption that within 90 days the FDIC will seize the bank by appointing a receiver or conservator, if the bank remains critically undercapitalized.

Given the importance of the regulatory power to seize a bank from its shareholders and management, it is worth providing a fuller list of the violations that allow such a seizure. FDICIA lists a number of acceptable justifications, including:

Inability to meet obligations. This is essentially a test of liquidity, the ability of the bank to meet its near-term obligations. The other major reason for an inability to pay, that it simply owes more than the value of its assets, would be captured directly by the capitalization tests below.

Losses. This clause would be invoked if a bank has incurred or is likely to incur losses that will deplete all or substantially all of its capital, and there is no reasonable prospect for the institution to become adequately capitalized without federal assistance.

Undercapitalization. This applies if a bank is undercapitalized and: (i) has no reasonable prospect of becoming adequately capitalized; or (ii) fails to become adequately capitalized when required to do so; or (iii) fails to submit a capital restoration plan acceptable to its primary regulator and the FDIC within the prescribed time; or (iv) materially fails to implement an agreed capital restoration plan. "Undercapitalized" for this purpose would most likely mean having Tier 1 capital of less than 4% of the bank's total assets. (Banks otherwise viewed as strong by the FDIC may operate at a 3% ratio without being undercapitalized, but this is unlikely to apply to a troubled situation.) The FDIC has a wide-ranging ability to require a higher ratio for a bank about which it is worried, but may be reluctant to make this the basis of an eventual seizure, particularly of one of the nation's largest banks.

A bank must be given at least 45 days to respond with a capital restoration plan and then the FDIC must consider that plan before acting. Unfortunately, a great deal of damage could be done in a short time if word leaked out that a bank faced such a situation.

Critical undercapitalization. This applies when a bank is critically undercapitalized, based on a ratio of Tier 1 capital to total assets. FDICIA has established a minimum leverage ratio of 2% for this test, using only tangible equity as capital for the calculation. However, the FDIC has the right to act even when the ratio is higher. The statute also allows seizure if the bank "otherwise has substantially insufficient capital."

The ability to seize a bank under these various defined circumstances gives regulators a very powerful weapon to push bank managements and shareholders to act. The existence of these powers also makes banks take very seriously the requirements to promptly correct the milder problems that crop up as a bank becomes less than well-capitalized by regulatory standards. The potential escalation of regulatory actions is severe enough to provide a strong motivation to fix small capital holes before they can become large.

How much capital do banks usually carry over the regulatory minimum? Why?

There is no easy answer to this question, since there is a wide range of conservatism across different banks in different countries. There are two main factors at work. First, as discussed earlier, there are the demands of important constituencies who may effectively force the bank to hold more capital than the regulators would. For example, a bank which needs a high rating to conduct its business strategy would likely need more capital than the regulatory minimums. Second, a bank may be more or less conservative in the levels of protection that it seeks beyond the minimum needed for external constituencies. No bank wants to be forced into taking actions suddenly if bad news causes them to pierce the minimum capital levels they seek to hold, so it is good strategy to hold some reasonable buffer. The extent of this varies with management's conservatism, which itself may vary with the times. In good times, there may be a lesser feeling of urgency about holding capital buffers. On the other hand, in the aftermath of the current crisis, banks are generally holding substantially higher buffers. Part of this, of course, is the knowledge that regulators are going to increase required capital levels and another part is probably a concern that there could be further losses. However, a substantial part of the increased conservatism is undoubtedly a desire to reassure all their constituencies that they have more than adequate capital.

The significant level of cushion currently held by the U.S. banking system over and above the regulatory requirements can be seen from figures provided by the FDIC for the end of the third quarter of 2009. The system had a ratio of Tier 1 capital to risk weighted assets of 11.5%. This is far above the 6% ratio required to be considered "well capitalized." Similarly, the ratio of tangible common equity to total assets was slightly under 8%, considerably above the 5% level of all Tier 1 capital to total assets required to be "well capitalized." Of course, these aggregate figures hide a wide range of individual states of health, with a number of banks inadequately capitalized to a greater or lesser extent.

Do higher capital requirements always make banks safer?

Unfortunately, banks can respond to higher capital requirements in ways that make them less rather than more safe. For example, banks avoided some of the effects of existing capital requirements by selling assets to "off balance sheet" entities, such as Structured Investment Vehicles (SIV's). Virtually all analysts agree that the introduction of SIV's into the financial system exacerbated the financial crisis. They not only reduced the effective capital requirements constraining banks, but introduced additional liquidity and asset management risks that would not have existed had the assets remained on the balance sheets of the banks.

Similarly, banks could respond to a more stringent future leverage test by choosing to own riskier assets in order to increase the expected return per unit of capital used. This behavior could be curbed by the risk-weighted capital regime, but there is the potential for the weightings not to adequately reflect the true risk, either because the chosen weights are wrong or because the categories are too broad.

Thus, bank capital requirements need to be set in coordination with other regulations and with a good system of supervision and examinations, ideally aided by transparent accounting that allows the capital markets and rating agencies to form their own judgments about the true riskiness of the activities of the banks.

What has been decided about regulatory changes?

No firm decisions have yet been made about the overall capital levels to be required in the long-term. However, there is a clear consensus that minimum levels need to be raised. For example, the Basel Committee agreed in July of 2009 on a framework for revisions to the Basel II rules, which are to include new standards to

- "Promote the build-up of capital buffers that can be drawn down in periods of stress
- Strengthen the quality of bank capital
- Introduce a leverage ratio as a backstop to Basel II"

In addition "the Committee is also taking measures to mitigate any excess cyclicality of the minimum capital requirement and to promote a more forward-looking approach to provisioning."

This high-level framework was augmented by a detailed consultative document issued in December of 2009 with specific initial proposals. The proposals revolve around ways to strengthen bank capital and to introduce global liquidity standards. The capital proposals aim to achieve five objectives:

Raising the quality, consistency, and transparency of the capital base. Tangible common equity is to be treated more clearly as the cornerstone of the capital structure. This has two practical implications. First, deductions for goodwill and other intangibles will come directly out of common equity, rather than being applied to the whole of Tier 1 capital. The previous approach had allowed some banks to have good levels of Tier 1 capital, even after adjusting for intangibles, but built on a very low base of tangible

common equity. Second, the eventual recommendations on the level of tangible common equity are likely to be higher than the levels set for common equity currently.

Other forms of Tier 1 capital will have to be of higher quality. In particular, preferred stock will need to be perpetual, rather than simply having a long maturity. Related to this, features which made it likely that a bank would choose to redeem preferred shares early, such as a clause that "stepped up" the dividend rate after 10 years, will no longer be acceptable. In addition, all forms of regulatory capital, including "undisclosed reserves" and "revaluation reserves" will have to be fully reported in order to increase transparency.

Enhancing risk coverage. The Basel Committee has already issued guidelines for raising the level of capital needed for risks related to the trading book and to securitizations. These were issued in July of 2009 and will take effect at the end of 2010. In addition, the December proposals focus on ensuring that counterparty risk is adequately covered by capital.

Supplementing the risk-based capital requirement with a leverage test. There is wide agreement that sole use of risk-based capital requirements, particularly when combined with the employment of complex models, brings two risks that can be somewhat alleviated by including a leverage test as a second constraint. First, banks have the potential to "game" any system of risk weightings and it is difficult for regulators to block all the loopholes. To the extent this occurs, the effective capital requirements are lower than intended. Second, banks can end up quite highly levered. Even if the assets are low-risk in nature, the recent crisis has emphasized the dangers for the economy and the banking system if a need for deleveraging arises. The U.S. experience in the financial crisis suggests that a leverage test can be a useful supplement to risk-based capital rules, since the worst problems occurred in the investment banking sector, which had no leverage test, rather than in the commercial banking sector, which still had such a test.

Reducing procyclicality and promoting countercyclical buffers. As discussed later in this paper, many observers have become convinced that current capital rules exaggerate economic and financial cycles, exacerbating alternating credit booms and crunches. In general, the Basel Committee proposes to study a number of specific ideas that might help alleviate the procyclicality, but is not ready to make a full range of specific suggestions. It does indicate an intention to make it easier for regulators to push for higher loan loss reserves and to discourage the payment of dividends in times of stress.

Addressing systemic risk and interconnectedness. Similarly, the Committee has identified the importance of these issues, but is not yet ready to make recommendations. The consultative document indicates that policy options in this area are still underdeveloped and that it will do what it can to help flesh them out. In particular, it promises to study the options of higher capital charges for systemically important banks as well as higher liquidity requirements.

The U.S. Administration, through the Treasury Department, issued a series of broad guidelines contained in a White Paper in the summer of 2009. However, these principles are so broad that it does not tell us much about the specific decisions that will ultimately be made.

What is the timetable for the remaining decisions?

The Basel Committee's consultative document requests comments by April 16th, with the intent of settling on specific new rules by the end of this year. These rules would "be phased in as financial conditions improve and the economic recovery is assured, with the aim of implementation by end-2012." This timing could be affected by the need for incorporation into national law and regulation – they do not apply automatically.

In the U.S., the Treasury Department intended to suggest specific changes to the capital rules in a paper to be issued by the end of 2009, following up on the principles stated in the earlier White Paper. This self-imposed deadline has slipped into early 2010. These suggestions are to be debated over the course of 2010 and agreed by the end of this year. There is no mention of transition periods beyond that, but it seems highly likely that the rules will not spring into full force in January 2011, especially as transitional arrangements are one of the easiest political compromises to reach. There will probably be quite good economic reasons to provide a transition period anyway, since no one wishes capital rules to change so quickly that it brings back, or exacerbates, a credit crunch.

Current Policy Issues

Why are policymakers proposing higher capital requirements?

The recent financial crisis drove home the importance of capital adequacy. The Basel Committee summarized the problem as follows:

> One of the main reasons the economic and financial crisis became so severe was that the banking sectors of many countries had built up excessive on- and off-balance sheet leverage. This was accompanied by a gradual erosion of the level and quality of the capital base. At the same time, many banks were holding insufficient liquidity buffers. The banking system therefore was not able to absorb the resulting systemic trading and credit losses nor could it cope with the reintermediation of large off-balance sheet exposures that had built up in the shadow banking system. The crisis was further amplified by a procyclical deleveraging process and by the interconnectedness of systemic institutions through an array of complex transactions. During the most severe episode of the crisis, the market lost confidence in the solvency and liquidity of many banking institutions. The weaknesses in the banking sector were transmitted to the rest of the financial system and the real economy, resulting in a massive contraction of liquidity and credit availability.[9]

[9] Taken from the Executive Summary of the Consultative Document on "Strengthening the Resilience of the Banking Sector," available at www.bis.org

Why were capital levels inadequate? Fundamentally, the losses at the banks turned out to be substantially higher than seemed likely based on the types of analyses that were used to set capital requirements. Either this represented very bad luck -- the proverbial "hundred year storm" -- or the analyses had underestimated the risks. The large majority of observers have concluded that the earlier analyses were too optimistic, a conclusion supported by the evidence of ways in which banks, and traders within banks, appeared to have "gamed" the system by taking on types of risks which were not well-captured in the models, such as liquidity risk. The use of less optimistic assumptions to estimate the needed levels would automatically argue for higher minimum capital requirements.

Further, it seems clear that many of the banks would have been significantly less damaged if they had held higher levels of capital to reassure their various constituencies. Much of the difficulty around the world stemmed from a crisis of confidence which might have been avoided with larger cushions of capital. The infusion of government capital into private sector banks around the world clearly was one of the most important elements that restored confidence to the markets, suggesting that holding higher levels of capital in the first place would have helped reduce the severity of the crisis.

What worked and what didn't work during the crisis?

It is difficult to tell what did work during the financial crisis, given that we experienced the worst global breakdown in the financial system for about 60 years. The existence of capital requirements and some of the specifics of how they were managed may have kept the situation from being still worse, but we will never know. I personally believe it likely that the use of a minimum leverage test in the U.S. helped mitigate the problems. That is, the use of an additional test where assets were not weighted by their assumed level of risk seems to have kept total capital levels higher than they might otherwise have been. However, we cannot rule out the possibility that some of the actions taken to work around the capital requirements, such as the use of SIV's, might not have occurred if all the relevant tests had been risk-weighted.

On the other hand, there are many aspects of capital requirements that clearly did not work well during the financial crisis. These include:

Weaker forms of capital. Forms of capital other than common stock only work if they can indeed be used to protect other parties, such as depositors, by absorbing losses. In practice, regulators and banks found themselves in situations where they were unwilling to have subordinated debtholders or preferred shareholders take a loss. The basic fear was that the financial system was so unsettled that if these stakeholders took a loss at one institution there would be a much wider range of parties who would panic. Senior debtholders at the same institution might fear that their turn would be next, depending on the exact circumstances. Subordinated debtholders or preferred shareholders at other firms could easily become concerned about their own situations and even senior debtholders at other firms might worry that next time the losses would fall on them as well. Clearly, anything that is to be counted as capital in the future needs to be structured and treated in a way that makes it clear that it may actually be called upon to absorb losses.

Elements of Basel II rules. Certain aspects of the Basel II capital calculations did not work as hoped. First, most analysts believe that the lack of a straight leverage test (capital to assets, without a risk weighting) led to excessively low capital levels at many European banks and at U.S. investment banks. U.S. commercial banks and bank holding companies were under rules based on the Basel I rules and were required to meet a straight leverage test. Going forward, the Basel Committee's Consultative Document includes a straight leverage test. Second, Basel II allowed the larger, more sophisticated banks to measure the risk level of many of their assets using their own in-house models, provided they met a number of requirements. Unfortunately, it is now clear that these models often substantially underestimated the likelihood of severe "tail" events and the depth of the damage that they could cause. Related to this, there appear to have been a number of types of risk, such as liquidity risks on securities, which were effectively ignored or seriously underestimated in these models.

Off-balance sheet entities. U.S. banks were particularly prone to move assets off of their balance sheets to entities that were technically separate, but that had too many ties to the banks to be allowed to fail in practice. The prime example of this was the creation of SIV's, which were specialized companies that were set up to borrow short-term money in the capital markets and to purchase securitized loans and other assets from the banks. These entities passed the accounting tests for determining whether they were external companies that did not need to be included in the banks' consolidated balance sheets. Therefore, bank assets were sold to these external entities and the capital requirements of the banks fell as their asset levels declined. Unfortunately, the SIV's were in truth generally creatures of the banks that sponsored them, or at least highly dependent on them in times of financial crisis. Usually the sponsoring bank either had an agreement to provide funds to the SIV as needed, effectively transferring the credit risk back to the bank, or had close ties to the SIV that made it necessary to rescue the SIV to protect the reputation of the bank.

Prompt corrective action (in part). In theory, the ability of U.S. bank regulators to force prompt corrective actions to cure capital problems or unsafe and unsound business practices should have prevented many banks from hitting the point of insolvency and should have held losses to relatively low levels for those banks that did fail. It is likely that PCA did achieve this to some extent, although it is difficult to know for sure since we do not know what would have happened without it. However, it clearly failed to achieve the high goals set for it by its proponents when it was first put into law. The FDIC has already taken over well more than 100 banks and will almost certainly take over many others in the aftermath of the current crisis. Even worse, it appears that the average loss for the FDIC on these banks is running at approximately 28% of the book value of the assets prior to insolvency. This is a mammoth percentage, dwarfing the size of the capital cushions that were intended to be held and re-emphasizing that capital requirements by themselves cannot prevent bank failures and large losses.

Will banks find a way to evade tougher requirements?

The banking industry will certainly attempt to find legal means to reduce the effect of higher capital requirements. Some of these actions can be viewed as "intended" by regulators, such as an increased use of securitization or other means of genuinely moving risk off of the banks' balance sheets and on to other parties.

Other actions should be viewed as "unintended." For example, previous capital rules spurred the invention of SIV's, as discussed earlier. Bank regulators are very aware of the problem with SIV's and will clearly try to ensure that regulatory and accounting rules prevent their use in the future, except if they are truly independent entities. However, banks will certainly look for other workable ways of moving assets off of their balance sheets. Some of these may effectively understate the continuing risk to the bank on the transferred assets, possibly because the risk-weighting set for them by regulators is too low.

There will also be attempts to structure loans or investment assets so that they fall into lower risk-weighting categories than they normally would or so that the nominal size of the asset is lower even though the risk level is not proportionally reduced. Again, regulators will attempt to keep up by either forbidding certain of these instruments or refining their risk-weightings, however they will inevitably run behind the inventiveness of the bankers.

Thus, it is clearly the case that the effectiveness of the capital requirements will be somewhat blunted by bankers' abilities to get around the rules in ways that were not intended by the regulators. However, capital requirements normally do seem to achieve a substantial portion of their intended effects, since some of the rules can be hard to work around and there is also a cost to evasion. The inefficiencies inherent in most methods of reducing capital requirements generally mean that banks are indeed more careful about their capital levels and the risks they take than they would be without such regulatory requirements.

The author is a former long-time banker and can attest to the seriousness with which capital requirements, including those of the rating agencies, affected credit decisions. The internal formulas at the banks at which I worked allocated capital to transactions, and required returns on that capital, based on regulatory and rating agency capital rules even when internal bank models showed a lesser need for capital to back that deal. This strongly suggests that there was not an easy ability to evade the capital requirements, otherwise the banks would not have turned down business that produced a return too low to cover capital requirements based on externally mandated formulas.

What are the negatives of higher bank capital requirements?

Higher bank capital requirements are likely to result in higher interest rates on loans, lower rates on deposits, and reduced lending. As described earlier, higher capital levels increase the total expense of operating a bank and making loans, even taking account of the decrease in the cost of each dollar of bank equity and debt due to the greater safety of a bank which operates with more capital. This higher level of expense for the banking system can be offset in part by reducing other expenses, such as compensation and administrative expenses. However, the net effect is still likely to be negative, leading to a need to improve the net return on loans by turning down the least attractive loan opportunities, charging more for those that are taken on, and reducing deposit costs to increase the margin between the interest rates earned on loans and those paid for funding the loans.

All of this assumes that the higher capital requirements are fully effective. The impacts will be lessened if banks find ways to avoid actually increasing the level of capital per unit of risk. This could be done through the types of activities described earlier under "Will banks find a way to evade tougher capital requirements."

A critical question is therefore how large the changes in loan availability and pricing would be for a given increase in minimum capital requirements. There is no definitive answer, and relatively little specific analysis at this point in the process, but previous analyses of mine[10] suggest that the magnitude of the effects would likely be relatively small for the range of capital increases being considered by regulators. Further, these effects must be considered in the light of the massive negative effects on the economy of severe shocks to the financial system such as we recently experienced.

Should capital requirements vary over the business cycle?

Many analysts have looked back at the recent crisis, and at previous financial crises, and concluded that a major problem is the build-up of risk in "good times". At the extreme, a period when asset prices are experiencing a bubble can cause banks and other financial institutions to take heavy exposures to assets whose prices are unrealistically high. The large apparent profits being earned by banks also tend to contribute to these bubbles by creating additional capital to be deployed at a time when there are many tempting ways of taking asset risk. The good times often end precipitously with a sharp drop in asset prices, leaving the banks with major losses. This can then throw the cycle into reverse where the loss of capital leads to a credit crunch which hits asset prices and the economy even harder.

There is a great deal of interest in "counter-cyclical" capital requirements whereby required minimum capital levels would increase when banks were making high profits and decrease, at least back to base levels, when profits are low or negative. The idea is that the cycles themselves would be made shallower by reducing the role banks play in encouraging excessive speculation and that banks would build up higher capital bases to cover the losses that can occur when bubbles burst. On the other side of the cycle, some propose that capital requirements would drop below base levels during downturns in order to ease the problem of credit crunches.

The virtues of a counter-cyclical approach are fairly clear. If it works, it would help banks build capital bases during the good times, when the cost for the economy as a whole might be relatively light, and would mitigate the damage from credit crunches in the bad times, since losses would not automatically diminish capital levels to the point where they forced banks to pull back on lending.

However, there are also counterarguments. First, raising capital requirements in the good times would restrain credit growth and likely thereby hold down economic growth. It may be that the "good times" are genuinely good and that the economy could prosper even further from additional investment, as opposed to the good times simply resulting from over-optimism and over-blown financial markets. Thus,

[10] Please see http://www.brookings.edu/papers/2009/0924_capital_elliott.aspx and [put in link to "A Further Exploration of Bank Capital Requirements".]

the opportunity cost might be larger than assumed by proponents. Second, lowering minimum capital requirements may not significantly mitigate a credit crunch during the bad times. For example, banks may be unwilling to let their capital ratios fall, due to a concern that investors and creditors may need the reassurance of stronger capital ratios rather than weaker ones. One of the problems is that many constituencies do not have faith in the accounting figures as a fair representation of a bank's financial condition during times of trouble. So there is a natural impulse to want to see higher capital ratios to provide creditors with further protection.

It appears that most analysts have concluded that the benefits outweigh the costs. There certainly seems to be considerable momentum in official circles to create counter-cyclical measures. However, the exact nature of these remains unclear at this point.

What is "contingent capital"? Is it a good idea?

Contingent capital comprises securities that are not by their fundamental nature capital, such as pure debt securities, but for which there is an agreement from the beginning that they will convert into a form of capital if certain triggers are met. For example, a debt security with a 20-year maturity might be issued which contains contractual arrangements by which it would convert into common stock on pre-agreed terms in the event that the bank had a tangible common equity ratio of less than 4%. One way to view this is as debt on which the owners of the security have agreed in advance to a "debt for equity" swap under certain conditions. Such swaps are often a useful way to re-establish a sound balance between debt and equity when a company gets into trouble. One problem, however, is that they can be very difficult to negotiate at the time they are actually needed. The terms may also be very onerous from the point of view of the original shareholders, given their weak negotiating leverage at a time of financial distress. Contingent capital can theoretically overcome the first problem and may help with the second.

Proponents of contingent capital generally favor it as a relatively cheap way to provide a buffer of extra capital over and above the standard minimum requirements. The cost would be relatively low because purchasers of the security would generally only buy if they thought there was a small probability that the securities would ever convert into capital. For example, assume a straight 20-year debt security would require a 6% interest rate in order to appeal to investors and that investors believed there was only a 5% chance the security would ever convert to common stock and that it would likely be at least 5 years before such conversion. If a conservative investor chose to assume that the security would be worthless after any conversion – an extreme assumption – they would still only need to charge roughly 1 percentage point extra per year in order to make up for that 5% risk over the course of the period in which they were confident that conversion would not occur. In the far more likely case that no conversion occurred they would profit from the extra 1% interest rate for the whole 20 years. From the point of view of the bank, paying an extra 1% a year would be much cheaper than selling common stock up-front on which investors might demand an expected annual return of 15%. In addition, interest paid on a debt security would be tax-deductible for the bank, lowering the after-tax cost still further.

Thus, contingent capital could be a very good economic deal for both the bank and the investors, if that contingent capital substituted for regular forms of capital. For example, regulators might want a bank to have a 10% Tier 1 capital ratio, but be comfortable with an 8% ratio if there were also two percentage points of contingent capital with an appropriate trigger. In that circumstance, the contingent capital would be considerably cheaper than issuing common stock and would likely also be cheaper on an after-tax basis than other forms of Tier 1 capital, such as the types of preferred stock that qualify for inclusion in that category.

Advocates of contingent capital also hope that it would establish a market price for the contingency that conversion might occur. Since the triggers would be set so that conversion would only occur in conjunction with financial distress, this would be closely related to a market price of an option tied to financial distress. If there is a liquid market in that instrument, changes in the pricing would help regulators, bankers, rating agencies, and investors to see when a bank is encountering higher risks of financial distress, at least as estimated by the markets.

One of the key aspects of contingent capital design is to decide what triggers would be used to cause conversion and how it would occur. The first issue is whether the triggers should relate only to the health of the individual bank or would also, or alternatively, be related to the health of the banking industry[11]. Second, there is the question of the precise nature of the trigger, whether it is to be based on the levels of accounting figures or ratios, such as capital ratios, or on regulatory actions, or management actions. Third, would the trigger cause a conversion into a number of shares based on then-current stock prices or based on a pre-agreed stock price?

There are several potential disadvantages to contingent capital. First, they are only as good as the triggers chosen for them. For example, if the trigger were set at too low a capital level it might be that such a bank would already be doomed, even with the infusion of capital caused by conversion of the contingent security. Capital works best when it is large enough to provide a high degree of confidence in the safety of a bank. If a bank is already on an irretrievable downward spiral, then having some extra capital can reduce losses for other parties, but is not likely to fully protect them.

Second, it could be that investors would demand too high a price for contingent capital, especially if the security is badly designed, such as with triggers that investors fear could easily cause conversion, either because they are too onerous or too ill-defined.

Third, contingent capital levels could be set in a way that makes them yet another burden on the banking system. For example, if the basic capital levels and other rules already produce a safe system,

[11] A trigger related only to the situation of a specific bank potentially raises certain “moral hazard” issues whereby the knowledge of the ability to garner an automatic infusion of capital might cause the management of a bank to take greater risks or act in some other undesirable manner. On the other hand, tying the trigger to broader industry trends may make the securities harder to sell at a reasonable price, due to their greater complication, and foregoes some ability to help save troubled banks that suffer from idiosyncratic problems.

then adding contingent capital on top might create an additional drag on profitability without a commensurate increase in safety.

Fourth, there are at least theoretical moral hazard issues. A badly designed trigger might give a management team the opportunity to effectively issue stock cheaply by forcing the conversion of the contingent capital through accounting games. In practice, there is likely to be a significant market stigma to triggering such a conversion, leading managements to work hard to avoid triggering conversion. Also, conversion ratios would likely be set in a way that provides for surety of capital issuance, but on terms that would not appeal to existing shareholders and therefore not to managers either.

Taken all in all, there is fairly strong backing among policy analysts and public officials for the use of contingent capital. The devil, however, is in the details and there is still much to be worked out.