ABCs of Banking

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Can a Banking Firm ever have too much Capital or Liquidity?

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The Basics of Capital

What is Capital? Capital is a measure of the ability of a firm to absorb losses.

- Both Markets (i.e., investors and financial analysts) and Supervisors recognize the loss-absorbing value of capital. But there is some tension in the amount of capital desired by Markets and Supervisors.

The Markets.

- Investors want banking organizations to have sufficient capital to operate profitably and to be able to withstand shocks—just like supervisors. Investors also expect a return on their investment, and are willing to take some risk and potentially lose some value in exchange for the opportunity to gain profits from the bank's operations.
- The more shares of common stock that a banking firm issues—that is, the more capital the firm raises--the less profit each investor receives because the profits of the banking firm must be divided among all investors. So, investors measure the return on capital, or earnings per share of stock, and reward management for greater returns on capital.
- While this rewards management for running a profitable business, it also provides an incentive for management to minimize the issuance of stock and the level of capital.

The Supervisors.

- The Supervisors want to minimize the risk of failure of banking firms. Bank failures hurt bank customers, impose costs on taxpayers, disrupt markets, reduce credit availability and can pose risks to the broader financial system.
- This provides an incentive to Supervisors to maximize capital requirements at banking firms, especially the issuance of common stock, which is the strongest form of capital.

Capital distinguished from Liquidity

Capital and Liquidity are different and serve different purposes.

- **Capital** measures the liquidation value of the bank, that is, the ability of the bank to repay ALL its creditors upon the sale of all of its assets. Capital is a balance sheet measure, computed periodically.
- **Liquidity** is a measure of a bank's ability to pay its debts as they come due. It measures the cash and other assets easily converted to cash that the bank can use to repay its depositors and other creditors as part of its daily operations.

Two types of measures; two types of failures. A firm can fail in two ways:

- **Capital insolvency**. The value of the assets of the firm are not sufficient to repay all the obligations of the firm ***on liquidation***, regardless of whether the firm has sufficient cash on hand to repay its debts as they come due in the short/medium term. (At some point, the cash held by a firm runs out and it must sell assets to repay debts.)
- **Liquidity insolvency**. A firm does not have sufficient liquid assets to pay creditors ***as debts come due*** in the normal operation of the firm, even though the bank may have sufficient capital to ensure the *ultimate* repayment of all its creditors if the firm were liquidated.

Sources of Capital Requirements

Investors

Capital Requirements imposed by Statute

- FDIC Improvement Act of 1991
  - Prompt Corrective Action--
    - Leverage ratio and risk weighted capital requirements
    - Legal minimum capital requirements
    - Uniform Requirements among all types of DIs
- Dodd-Frank Act (2010)
  - Enhanced Prudential Capital Requirements
  - Debt/Equity limit
  - Capital stress tests
- Collins Amendment to the Dodd-Frank Act (2010)
  - Basel I floor
  - Uniformity between HCs and DIs

More Sources of Capital Standards: The Bank Supervisors

Capital Requirements motivated by the Basel Committee--International Uniformity (sort of)

- Basel I: Risk-weighted capital
- Basel II: expanded Risk-weighted capital
  - Advanced approaches with internal models
  - Supplemental leverage ratio
- Basel III and its endgame
- Capital Buffers
- LTD/TLAC (Long term debt/Total loss absorbing capital)

Capital Requirements shaped by Experience—some examples

- Ad hoc capital negotiations become regulatory requirements.
- Higher and higher capital levels
- Risk weights
- Capital Stress Tests and focus on Tier 1 common
- Accumulate Other Comprehensive Income (AOCI)—proposed change in treatment of losses on assets available for sale

First Bank, N.A.

Assets (in millions)		**Total**	**Liabilities & Capital (in millions)**		**Total**
Cash		**$9**	Total Deposits		**$440**
Reserves held at the Federal Reserve		**$20**	Demand Deposits	$100	
Total Investments		**$40**	Savings & Time Deposits	$225	
US Government securities	$30		Money Market Assets	$115	
GSE securities	$10				
			Other Borrowed Funds		**$9**
Total Net Loans and Leases		**$430**	Subordinated Debt (long term)		**$1**
Gross Loans and Leases	$437		**Total Liabilities**		**$450**
Mortgages	$200				
Consumer loans	$87		**Stockholders Equity**		
Small Business loans	$100		Preferred stock—perpetual, noncumulative	$5	
Highly levered commercial real estate loans	$50		Common Stock (41 million shares issued)	$1	
Allowance for Loan and Lease Losses	$7		Additional Paid-in Capital	$40	
			Retained Earnings	$4	
Premises, equipment and other assets		**$1**	**Total Stockholders Equity**		**$50**
Total Assets		**$500**	**Total Liabilities and Stockholders Equity**		**$500**
Backup lines of credit to commercial entities (off-balance sheet)	$40				

How does capital absorb losses?

The "Balance" in Balance Sheet. Under GAAP, the value of Total Assets on a company's balance sheet *must always equal* the value of its Total Liabilities and Stockholders Equity—thus the term "Balance Sheet."

Accounting for a Loss. Assume the value of an asset held by First Bank declines. For example, say that a $10 million small business loan made by First Bank goes into default.

- **Adjustments to the Asset side**. On a reporting day, First Bank would mark down the value of its Small Business loans from $100 million to $90 million and the value of its Total Loans from $430 million to $421 million. (To simplify this example and related capital calculations, we will assume that First Bank included $1 million in its Allowance for Loan and Lease Losses to absorb a portion of this loss).
- **Adjustments to the Total Liabilities and Capital side**. To remain in balance, there must also be a reduction on the Liability & Stockholders Equity side of the Balance Sheet. Since the amount the Bank owes to its depositors and other creditors has *not* changed, the adjustment must be made to the Stockholders Equity Account. The loss would be reflected in a reduction of Retained Earnings and Paid-in Capital.
- **Failure**. If losses at First Bank exceed its capital amount, First Bank will not have sufficient assets to repay all its liabilities. It will be bankrupt—or, in regulatory terms, capital insolvent.

First Bank, N.A. (After loss)

Assets (in millions)		**Total**
Cash		**$9**
Reserves held at the Federal Reserve		**$20**
Total Investments		**$40**
US Government securities	$30	
GSE securities	$10	
Total Net Loans and Leases		**$421**
Gross Loans and Leases	$427	
Mortgages	$200	
Consumer loans	$87	
Small Business loans (with $10 mill loss)	**$90**	
Highly levered commercial real estate loans	$50	
Allowance for Loan and Lease Losses	$6	
Premises, equipment and other assets		**$1**
Total Assets		**$491**
Backup lines of credit to commercial entities (off-balance sheet)	$40	

Liabilities & Capital (in millions)		**Total**
Total Deposits		**$440**
Demand Deposits	$100	
Savings & Time Deposits	$225	
Money Market Assets	$115	
Other Borrowed Funds		**$9**
Subordinated Debt		**$1**
Total Liabilities		**$450**
Stockholders Equity		
Preferred stock—perpetual, noncumulative	$5	
Common Stock (41 million shares issued)	$1	
Additional Paid-in Capital	**$35**	
Retained Earnings	**$0**	
Total Stockholders Equity		**$41**
Total Liabilities and Stockholders Equty		**$491**

Supervisory approach: focus on the most loss absorbing forms of capital

Tier 1 Capital–the most loss-absorbing elements of capital includes two parts:

1. Common Equity Tier 1--CET1. CET1 is the most loss absorbing type of Tier 1 capital. CET1 includes:

- Common equity (and accompanying Additional paid-in Capital)
  - Last to be repaid in bankruptcy/liquidation; receives only residual value if any exists
  - No requirement that it be repaid or retired: perpetual in duration
  - No required dividends, so does not drain resources of the firm
- Retained earnings (because Retained earnings are paid out to investors only if not needed to absorb losses)

2. Perpetual, Non-cumulative Preferred Stock (Tier 1 capital, but not considered CET1

- Same attributes as common stock, though repaid before common stock (by definition, these shareholders are "preferred" to the common shareholders)

Some loss absorption capacity: Tier 2 capital

Tier 2 Capital. Other instruments that are available to absorb losses, but with a temporary duration or with a cost.

- Temporary Non-cumulative Preferred stock and Cumulative-dividend preferred stock
  - Offers loss absorption capacity similar to common stock and perpetual preferred stock
  - Less favored because temporary in duration and/or requires payment of dividends (depletes firm's resources)
- Long-term Subordinated Debt
  - Some loss absorbing capacity because repaid only after more senior creditors—owners expect to be last creditors repaid
  - Less favored because limited duration and requires payment of interest (depletes firm's resources)

Because Tier 2 instruments have drawbacks that reduce their ability to absorb losses, only a portion of these instruments are included in regulatory capital

Total Capital. Total Capital equals Tier 1 capital plus qualifying amounts of Tier 2 capital.

The simplest and first capital measure: The Leverage Ratio

Leverage Ratio = Total Regulatory Capital as a proportion of Total Assets

- **Total capital** for regulatory purposes equals all Common Equity Tier 1 capital (CET1) *plus* all other Tier 1 capital *plus* qualifying amounts of Tier 2 capital
- **Total Assets** for regulatory purposes equals Total Balance Sheet Assets

Example: First Bank (see slide 6)

- Total Regulatory Capital = $51 million
  - Total Common Stock plus Additional Paid-in Capital (Common Equity Tier 1 capital) = $41 million
  - Retained Earnings (Common Equity Tier 1 capital) = $4 million
  - Non-cumulative, Perpetual Preferred Stock (other Tier 1 capital) = $5 million
  - Subordinated debt that qualifies as Tier 2 capital = $1 million
- Total Assets = $500 million
- Leverage Capital Ratio for First Bank = 10.2%

Evolution of capital standards

Advantages of the Leverage Ratio

- Easy to measure and calculate
- Provides a uniform measure of capital across firms because based on unadjusted balance sheet entries
- Transparent because all components can be found on the balance sheet

Disadvantages of the Leverage Ratio

- Viewed as unfair because it assumes the risk of loss is the same for all types of assets and requires the same amount of capital to be held against safe assets (like cash and government-guaranteed securities) as must be held against the riskiest assets (like loans to start-up businesses).
- Creates undesirable incentives to take risks
  - Because the Leverage Ratio is based only on the total amount of assets—*regardless of the amount of risk of the assets*--firms have an incentive to increase profits and lower the costs of capital by investing in riskier, potentially higher yielding assets than in safer, lower-yielding assets.
- Masks risk differences across banks—e.g., makes all banks with the same leverage ratio look equally strong even though different banks may have different risks of unexpected losses
- Doesn't take account of off-balance sheet risks

A first small improvement: The Basel I Risk-based Capital Ratio

Risk-weighting assets. The Basel I risk-based capital standard involved a system for weighting assets by risk using only 4 risk-weightings buckets for purposes of determining the bank's level of total risk-weighted assets.

- **0% weight** was assigned to assets deemed safe, like cash, claims on the US Government and other OECD governments and their direct agencies, and similar assets;
- **20% weight** was assigned to claims on US depository institutions and OECD banks, certain municipal securities, obligations of US government-sponsored agencies (like Fannie Mae and Freddie Mac and the Federal Home Loan Banks), and debt of certain international organizations like the World Bank and similar assets;
- **50% weight** was assigned to certain residential mortgage loans, certain multi-family mortgage loans, and certain municipal revenue bonds; and
- **100% weight** was assigned to all other assets reported on the balance sheets of depository institutions.

Off-balance sheet assets. Off-balance sheet assets (e.g., a standby letter of credit, back-up line of credit, or home equity loan) were included as assets for regulatory capital purposes.

- Weighting off-balance sheet items is a two-step process. First, off-balance sheet items are discounted to take account of their nature as contingent or indirect liabilities; then they are risk-weighted by type of asset.
- For example, a standby letter of credit to a corporation is discounted by 50% (because it is a contingent asset) and then assigned to the 100% risk weighting bucket (like other loans to a corporation); a back-up line of credit to an OECD bank would be discounted by 50% (because it is contingent) and then slotted into the 20% risk-weighting bucket (like other loans to OECD banks).

Risk-based capital example: First Bank

Assets (in millions)	Balance Sheet Amount	Risk Weight	Risk Weighted Amount
Cash	$9	0%	$0
US Government Securities	$30	0%	$0
GSE Securities	$10	20%	$2
Reserves held at the Fed	$20	0%	$0
Qualifying Residential Mortgages	$200	50%	$100
Consumer Loans	$80	100%	$80
Small Business Loans	$100	100%	$100
Highly Levered CREL	$50	100%	$50
Premises and Other Assets	$1	100%	$1
Backup line of credit (off-balance) $40		(Discount 50%); then weight 100%	**$20**
Total	**$500**		**$353**
Total Capital	$51		$51
Leverage Ratio	**10.2%**		
Risk-based Capital Ratio			**14.4%**

Basel II: A More Advanced Approach to Risk Weighting Assets

Basel II. As Supervisors and banks gained experience with risk-weighting, Supervisors began to consider more sophisticated models for weighting assets.

- Basel II was a new capital regime developed internationally that was designed to rely on risk-weights generated by models developed by banks (not supervisors) based on the actual historical loss experience of each bank with various types of assets, rather than on weights assigned by the supervisors.
- Large banks hoped that their more sophisticated models for weighting the risk of loss on individual assets would lead to lower capital requirements.
- However, in the United States, the 2008/09 financial crisis led to enactment of the Dodd-Frank Act, in particular the Collins Amendment, which established Basel I as a mandatory floor for regulatory minimum capital levels for all US IDIs and their holding companies.

Basel 2.5 and Basel III—
New Standards to Improve Capital

Current standards. Capital standards have continued to evolve in response to financial crises, the development of technology and experience in managing risk.

- **Higher minimum capital requirements were adopted.**
- **Quality of capital**. Capital standards now focus on higher quality capital, adding a new minimum standard for common equity Tier 1 (CET1) to the existing risk-based capital and leverage capital minimum standards.
- **More granular risk-weightings**. Higher risk weights were adopted for riskier assets, for trading assets and for OTC derivatives
  - The "Standardized Approach" revised and improved the Basel I risk-based capital ratio to add new risk categories with several risk weightings above 100% (as high as 1250%)
- **Risk of Trading assets recognized**. Market Risk weightings were revised to apply various risk weights to trading assets.
- **Buffers**. The "capital buffer" was invented
- **International Leverage ratio.** A minimum leverage ratio requirement was established.

Current Capital requirements in the US

Classification	Total Risk-based	Tier 1 Risk-based	CET1 Risk-based	Leverage
Well Capitalized	≥ 10%	≥ 8%	**≥ 6.5%**	≥ 5%
Adequately Capitalized	**≥ 8%**	**≥ 6%**	**≥ 4.5%**	**≥ 4%**
Under-Capitalized	< 8%	< 6%	< 4.5%	< 4%
Significantly Under-Capitalized	< 6%	< 4%	< 3%	< 3%
Critically Under-Capitalized				≤2% tangible equity

These are legal minimum requirements. In practice, a bank is expected to hold capital above these minimum requirements commensurate with the nature and extent of the bank's exposure to risk.

Why have multiple standards?

Risk-based capital requirement vs Leverage requirement

- **Advantages of Risk-based requirements**. As noted earlier, a Risk-based capital requirement better measures the capital needed to support the risk in each type of asset. A risk-based capital requirement also removes incentives created by a leverage requirement for a bank to invest only in risky assets in order to offset the smaller return attendant with safer assets.
- Risk based capital levels also allow better comparison between the strength of peer banks because the risk-based capital levels take account of both the risk and the capital levels of each bank.
- **Advantage of Leverage Requirements**. A Leverage capital requirement is simple and transparent. While not risk sensitive, a Leverage requirement can provide a minimum "floor" on levels of capital to account for the difficulty in correctly predicting risk-weights. For example, an IDI that owns only US Government securities is not risk-free (as a risk-based capital requirement might suggest) because operational or market disruptions may prevent the bank from selling even these safe assets.

The Belts and Suspenders Approach. In an effort to get the best of both worlds, US law requires Supervisors to set both a risk-based capital requirement and a leverage capital requirement.

- **The trick—which should be binding?** The minimum level required for each type of capital will determine which level is binding and which advantage will be paramount. Currently, the Supervisors lean toward making the risk-based capital requirement the primary requirement with the leverage ratio as a true floor.

Why 5 levels of capital? Prompt Corrective Action Statute

The Types and Levels of capital. PCA requires Supervisors to define 5 capital levels using BOTH a leverage measure and a risk-based measure, unless ALL the agencies agree to rescind one of the measures. The 5 levels are: Well Capitalized, Adequately Capitalized, Undercapitalized, Significantly Undercapitalized, and Critically Undercapitalized.

Prompt Corrective Action (PCA)--The Statutory Stick for IDIs. PCA requires Supervisors to take (or in some cases, consider taking) specific, increasingly tougher actions as the level of capital of an IDI declines. If an IDI becomes:

- **Undercapitalized** (i.e., capital is less than "Adequately Capitalized," thereby in effect setting the "Adequately Capitalized" level as the regulatory minimum capital requirement for all DIs):
  - The IDI may not pay dividends, must execute a capital raising plan, and is subject to growth and acquisition limits;
- **Significantly Undercapitalized**
  - All of the above may occur, *plus*, the IDI must issue capital; management compensation is restricted; and the Supervisor must consider changing IDI management, restricting interest paid on deposits, adding restrictions on growth, and certain other actions.
- **Critically undercapitalized** (by statute, this is a 2% tangible leverage ratio—a positive level of capital)
  - All of the above, *plus* the IDI must be closed or placed into receivership within specified time limits unless the Supervisory Agency and the FDIC agree that another course of action is more appropriate.

An Incentive For Higher Capital Levels

The Statutory Carrot for BHCs.

- **Background**. The Federal Reserve had set minimum capital requirements for BHCs beginning in the late 1970s using the Fed's general authority to adopt regulations to implement the Bank Holding Company Act. In 1999, the Gramm-Leach-Bliley Act (GLB Act) added express authority for the Fed to set capital requirements for BHCs. All IDIs and BHCs must be at least "Adequately Capitalized."
- **Repeal of Glass-Steagall in the US**. The GLB Act greatly expanded the powers of BHCs to include financial activities, including securities underwriting, insurance sales and underwriting and merchant banking activities. However, the GLB Act provided that ONLY a BHC that qualified to be a Financial Holding Company (FHC) could take advantage of the new broader powers and affiliations authorized by that Act.
- **The Incentive**. To qualify as an FHC, a BHC must itself be "well-capitalized" and all of the IDIs controlled by that BHC must also be "well capitalized" (and the BHC and all its IDIs are well-managed and the IDIs have strong CRA ratings). The authority given to FHCs to engage in a broad range of securities underwriting, merchant banking and other financial activities created a powerful incentive for BHCs to maintain capital at the "well capitalized" level.

How are BHC capital requirements different from DI capital requirements?

Consolidated requirements vs. Stand-alone Company Requirements. BHCs (including Financial Holding Companies) are subject to capital requirements on a consolidated basis—not stand-alone requirements, like IDIs.

- BHC capital requirements are applied to the consolidated balance sheet of the entire organization—that is, the assets and liabilities of the entire organization (including the assets and liabilities of the DI subsidiaries of the BHC and the assets and liabilities of the non-DI subsidiaries) are, in essence, added together when applying the consolidated capital requirements.
- Consolidated capital requirements have the effect (though not the legal requirement) of imposing capital requirements on each part of the holding company.
  - Consider a bank holding company with $50 in assets that owns a bank with $850 in assets and a mortgage subsidiary with $100 in assets. Upon consolidation, the assets of the BHC will equal $1000, which is the sum of the BHC's direct assets plus the assets of the bank and the assets of the mortgage company.
  - If the BHC must maintain a 4% minimum leverage capital ratio against the total consolidated assets of the BHC, it can meet that requirement by maintaining $40 of capital at the parent BHC. Alternatively, it can maintain $2 of capital at the BHC, $34 in capital at the bank and $4 at the mortgage subsidiary. Note that, while the bank may have $34 in capital to meet its own regulatory capital requirements, the mortgage company is unregulated and may not have $4 in capital (so the BHC will have to hold extra capital to make up for any shortfall at the mortgage company.
- Each IDI owned by the BHC must also meet the regulatory minimum capital requirements of its specific Supervisor at the IDI level.

Statutory capital requirements

Parity among depository institutions.

- For many years, the "Dual Banking System" of Federally chartered banks and State chartered banks, as well as the creation of different types of depository institutions (banks, savings associations, savings banks, industrial loan companies, etc.) allowed for different minimum capital requirements for different types of DIs.
- After the savings and loan crisis of the late 1980s, Congress enacted laws requiring parity in minimum capital requirements for national and state banks and across all types of DIs insured by the FDIC.

Holding Company Capital.

- Through the 2008/09 financial crisis, capital requirements were permitted to differ between bank holding companies, savings and loan holding companies, and DIs.
  - BHC capital requirements were less stringent than DI capital requirements--more types of instruments were permitted to count as capital for BHCs and the minimum leverage ratio for BHCs was less than for DIs. SLHCs were not subject to minimum capital requirements at all. This was intended to encourage holding companies to move riskier activities out of the DI into the nonbank part of the holding company.
- After the 2008/09 financial crisis, the Collins Amendment to the Dodd-Frank Act (section 171 of that Act, enacted in 2010) required that minimum capital levels be the same for DIs, BHCs and SLHCs.
  - The 2008/09 financial crisis illustrated that depository institutions were not immune from the risk in their nonbank affiliates
- The Collins Amendment also requires that those minimum levels be no lower than Basel I capital requirements, including both a leverage ratio and a risk-based capital ratio.

Off-Ramp for Community Banks

Background—Both a Leverage Ratio and Risk-Based Capital Ratio.

- The Banking Agencies adopted both a leverage ratio and a risk-based capital ratio in part because the two ratios were required as part of the Prompt Corrective Action framework adopted by Congress following the savings and loan crisis in the mid 1980s and reaffirmed in the Collins Amendment to the Dodd-Frank Act in 2010.

Growing Complexity of Risk Based ratio.

- Over time, the risk-based capital requirements became increasingly complex as the Agencies moved from 4 simple buckets for calculating risk weights to numerous categories of risk weights that better reflected the growing complexity of bank balance sheets—especially for larger banks.

Relief for Community Banks meeting the Community Bank Leverage Ratio.

- In 2018, Congress enacted the Economic Growth, Regulatory Relief, and Consumer Protection Act, requiring the Banking Agencies (among other things) to allow community banking firms to opt-out of the risk-based capital requirement. Congress believed that the increasing complexity around calculating risk-based capital ratios over-burdened community banks without enhancing their safety and soundness.
- Under new Agency rules, a bank or BHC with less than $10 billion in total consolidated assets (with minimal off balance sheet items and small trading activities) may elect not to compute or comply with risk-based capital rules so long as the banking firm maintains a capital leverage ratio of at least 9 percent—which is well above the minimum leverage ratio required to be well capitalized under the Prompt Corrective Action framework and other Agency rules.

Capital Stress Testing

A new approach to setting capital levels.

- The 2008/09 financial crisis showed that capital levels can be too low when set using models based on long periods of benign historical loss experiences.
- Adding a hypothetical period of great stress to the models would help overcome that weakness.

Benefits of stress-testing capital.

- Stress-testing capital minimizes the potential that the firm will fail during seriously adverse economic conditions;
- It also ensures that the firm can continue to lend during those periods, thereby helping the economy to recover;
- It provides investors some assurance that large firms can survive during seriously adverse economic conditions.

A Problem.

- If stress tests were made part of the Supervisor's minimum capital requirements, then, by law, a banking firm that did not have the capital level indicated by the stress test models would be subject to the stringent restrictions of the PCA framework. This punishment seemed harsh during good times AND would be difficult during a financial crisis, when actual losses might cause a banking firm's capital levels to decline below minimum capital requirements.

The solution.

- Instead of adding stress tests to the minimum regulatory capital requirements, stress tests were applied alongside the minimum requirements and outside the PCA framework, with a new incentive: a banking firm that does not have adequate capital after a stress test must curtail capital distributions: i.e., dividends and stock buy-backs.

Stress testing: Who and how often?

Who must conduct stress tests?

- Supervisory stress tests are applied only to banking firms with total assets over $100 billion (currently 34 banking organizations)

Two types of stress tests: An Agency run stress test, and a Company run stress test.

- Agency run stress tests:
  - Agency stress tests are conducted annually for firms with more than $250 billion in total assets; and every other year for firms between $100 billion and $250 billion in total assets.
  - Agency stress tests use uniform assumptions across banking firms about dividends, stock repurchases and growth
- Company run stress tests:
  - Conducted annually for firms with more than $700 billion in total assets, and every other year by firms with between $250 billion and $700 billion in total assets.
  - Company run stress tests include the company's own assumptions about its capital actions expected over a 2-year forward period.

How does the Federal Reserve capital stress test work?

The Stress scenario.

- In January, the Federal Reserve publishes an economic scenario representing a severe economic downturn that changes every year.
- The scenario sets out hypothetical economic conditions, including an inflation rate, an unemployment rate, changes in housing prices and other asset prices, and various other market factors.

The Test. Each banking firm subject to the stress test requirement must test its portfolios of assets under the conditions set out in the Federal Reserve scenario and estimate the amount of losses that would be expected under those conditions over the future 9 quarters beginning on the stress test date.

- For example, a decline in housing prices and an increase in unemployment would be expected to lead to greater losses on mortgages, credit card loans, auto loans, etc., than during normal times.
- The banking firm must deduct these losses over the period from the banking firm's current capital.
- The banking firm must also project—and deduct from capital--its expected capital distributions over the period.

The Test Results. The expectation is that the banking firm will continue to meet all regulatory minimum capital requirements even after taking these hypothetical losses for the entire 9-quarter period of the projected stress.

- Firms that fail to meet minimum capital requirements after taking into account hypothetical losses under the Agency-run stress test (that is, would experience hypothetical losses under the stress test that would reduce the firm's capital below the minimum capital requirements) may not pay dividends or conduct stock buybacks during the next year without Federal Reserve permission, though, typically, the Fed allows these firms to continue the previous year's level of dividends. This helps preserve and increase the firm's capital.
- The results of the stress tests are made public.

Capital requirements vs capital buffers

Regulatory minimum capital requirements.

- Failure to maintain regulatory minimum capital levels triggers PCA, which requires the supervisory agencies to take certain supervisory actions to force the banking firm to raise additional capital as quickly as possible or be closed and liquidated.
- Failure to meet the PCA well-capitalized capital requirement also jeopardizes the broader powers and privileges associated with FHC status.
- The financial crisis showed that, during periods of stress:
  - Banking organizations typically needed additional capital to cover larger than normal losses and often have difficulty raising capital,
  - The markets and customers react to declines in capital levels of banks by withdrawing funds (which exacerbates its problems).

Capital Buffers.

- The capital "buffer" was designed to be outside the PCA framework and the FHC requirements. A banking firm may draw down its capital buffer without triggering the PCA requirements, losing its FHC status or incurring an enforcement action by the supervisory agencies.
- Supervisors expect losses to reduce the amount of capital held in the capital buffers during periods of stress, but also expect firms to restore the capital buffer as conditions improve or capital becomes available.
- As an incentive to restore capital buffers, a banking firm that enters into its capital buffer may not pay dividends or discretionary bonuses to senior management until the firm has restored its capital buffer.

Basel III capital buffers: the Capital Conservation Buffer (CCB)

Buffer for all. Banking organizations of all sizes must maintain a capital conservation buffer (CCB) of at least 2.5% of risk-weighted assets above each of the regulatory risk-based capital minimums.

What is the buffer made of? The buffer must be CET1—that is, Common Stock and/or Retained Earnings.

Example: To be above the minimum risk-based capital requirements plus the CCB, a banking organization must maintain:

- CET1 Risk-based capital of at least 7%: Minimum CET1 Risk-based capital of 4.5%, plus a 2.5% CET1 buffer;
- Tier1 Risk-based capital of at least 8.5%: Minimum Tier1 Risk-based capital of 6%, plus a 2.5% CET1 buffer;
- Total Risk-based capital of at least 10.5%: MinimumTotal Risk-based capital of 8%, plus a 2.5% CET1 buffer.

Buffer for the largest banking firms. Banking firms with more than $100 billion in assets must maintain a capital buffer that is greater than 2.5% of risk-weighted assets **if** that greater amount is needed to pass the Agency capital stress test.

Example: Larger banking firms. A banking firm with more than $100 billion in total assets that needs capital equal to 0.5% of risk-weighted assets to pass the Agency run stress test must maintain a CCB of 3% (instead of 2.5%), in the form of added CET1, to meet the Capital Conservation Buffer.

Another buffer: the Counter-Cyclical Capital Buffer (CCyB)

Why?

- The CCyB is intended to address elevated risks from episodes of rapid asset price appreciation or credit growth not well supported by economic fundamentals, as happened in the US residential mortgage market during the period leading up to the recent financial crisis.
- The CCyB should curb exuberant credit activity and allow banking firms to continue to lend during the stressful period that follows exuberant times by providing a capital buffer to absorb losses generated from that activity.

Who? The CCyB applies only to banking organizations with greater than $250 billion in total assets or $10 billion in foreign exposure—about 22 banking organizations.

When? The CCyB applies only when triggered by the Federal banking supervisors.

- The CCyB will be activated when systemic vulnerabilities are meaningfully above normal.
- In general, the buffer will become operational 1 year after it is triggered. The Agencies propose to start the CCyB at a low number and increase it gradually. They have committed to remove the CCyB without delay.

How much?

- The CCyB is currently 0%, but may be as high as 2.5% of risk weighted assets.
- The CCyB may be applied only to certain types of credit exposures and only in specific jurisdictions.
  - For example, the CCyB may be applied only to residential mortgage assets—and only if generated in the US, but not those generated elsewhere in the world.

Dipping into a Buffer: Payout ratios

CCB Buffer (as a percentage of risk-weighted assets)	Maximum payout (as a percentage of retained earnings)
Greater than 2.5% (or the higher Stress Level)	No limitation based on buffer
Less than 2.5%, but greater than 1.875%	60%
Less than 1.875%, but greater than 1.25%	40%
Less than 1.25%, but greater than 0.625%	20%
Less than or equal to 0.625%	Agency approval required

- The amount of retained earnings that a banking firm can use for making capital distributions and paying executive bonuses depends on how much of the relevant buffer the banking firm uses.
- The payout ratios are the same for the CCyB.
- The Agencies have indicated they expect to remove the CCyB requirement during stressful periods to allow firms to take losses against that buffer of capital and continue lending.

A Special Problem: Capital at Large Global Banking Firms

Very Large banking firms pose special risks.

- **More damage to the economy**. The damage to the financial system and the economy from the failure of a large banking firm is significantly greater than the damage from the failure of a smaller firm:
  - Large banking firms are more interconnected,
  - Large banking firms play a greater role in the economy (payments system, wholesale markets, and international markets),
  - The failure of large banking firms creates more contagion effects than the failure of smaller banking firms.
- **Perception of being Too-Big-To-Fail**. The perception that large banking firms are "Too-Big-To-Fail" allows large firms to operate with smaller capital cushions than smaller banking firms.
  - Firms perceived as "Too-Big-To-Fail" can raise funds more cheaply and easily during a period of financial stress than smaller firms *even though the larger firms may not in fact be more resilient against failure*. This puts smaller firms at a disadvantage and encourages customers of smaller firms to move funds to larger firms during a financial crisis.
  - Credit-rating agencies give large firms higher credit ratings when the rating agencies believe the Government will support the large firm against failure.

A Three-part approach to Capital at Large Global Banking Firms

International agreement. After the 2008/09 financial crisis, international bank supervisors agreed that large, internationally active banking firms should be subject to three higher capital requirements than other banking firms. Why?

- Requiring large, globally active banking firms to have higher capital would improve the resilience of the firms themselves and reduce the potential that a large banking firm might fail and damage the financial system.
- It would help reduce the perception that these firms were "Too-Big-To-Fail" by replacing the expectation that the government would prevent the failure of these firms with a more concrete protection—additional capital.
- Higher capital requirements would increase the costs of operating large banking firms, thereby providing an incentive for these firms to reduce their size and potential impact on the financial system.

The questions.

- How should these Global Systemically Important Banks (GSIBs) be identified?
- How much capital should GSIBs be required to hold and in what forms?

Identifying GSIBs: One Method

The Basel Committee definition. To identify banking firms that pose the greatest risks to the financial system, the Basel Committee on Banking Supervision (BCBS) focused on 5 factors that indicate risks to the financial system:

- Size (Global exposures),
- Interconnectedness (exposures to other large banking firms),
- Complexity (Derivatives exposures, trading activities and assets),
- Cross-jurisdictional activity (a measure of international activities and exposures), and
- Substitutability (a sole or main provider of essential services like payments, custody, debt and equity underwriting).

Computation of GSIB score. To determine if a large banking firm is considered a GSIB, the banking firm calculates its exposures in each of the 5 categories listed above as a ratio of the total exposure of the largest 75 banking firms in the world. Those 5 resulting scores are then weighted and combined to give a total score for each large banking firm.

The GSIB score is intended to rank the largest firms according to their systemic risk. A banking firm with a score above a certain level is considered a GSIB, and is subject to higher capital and other prudential standards.

Identifying GSIBs: Method Two

A second method used by the Federal Reserve. The US adopted a second method for identifying a GSIB in the US that is used in addition to the BCBS method. This second method:

- Uses the same factors as the BCBS method except it includes a measure of reliance by the firm on short-term wholesale funding exposure *in place of the BCBS measure of* substitutability.
  - The US experience during the 2008/09 financial crisis was that failure of large banking firms was often caused by a loss of short-term wholesale funding, while the risks of substitutability were less due to the larger number of US firms
- Uses slightly different weighting of the subcomponents of the other four factors;
- Is based on a fixed weighting rather than a relative weighting that changes with the size and exposures of the 75 largest banking firms—this provides an additional incentive to reduce GSIB scores because the Method 2 score tended to be higher (and result in a higher surcharge) but firms could reduce their Method 2 score more predictably because it did not depend on the relative scores of other firms.

US BHCs must adopt the higher of the two surcharges computed using the two methods.

The BCBS method and the US Method identify the same banking firms in the US.

However, the 2 methods result in different GSIB surcharges for US banking firms.

Step 1: A Special Buffer for GSIBs

The GSIB Surcharge. All GSIBs are subject to a GSIB capital surcharge.

- The size of the GSIB Surcharge is a Risk-based capital buffer based on the GSIB score, and ranges from 0% capital to over 3.5%.
- The GSIB Surcharge must be filled with CET1 capital, and is added on top of the other regulatory minimum capital requirements ***and*** other capital buffers.
- The GSIB Surcharge was designed to reduce the probability of default of the largest banking firms so that the expected loss from the failure of a GSIB more reasonably approximates the expected loss from the failure of a non-GSIB.
- The GSIB surcharge is a capital buffer and works the same as the CCB and CCyB buffers.
  - As a GSIB dips into its GSIB surcharge, it must reduce capital distributions and executive management payouts.
- In the US, the GSIB surcharge applies only to BHCs, not to DIs.

Step 2: Two New Leverage Ratios for Large Banking Firms--The SLR and the eSLR

Minimum Leverage Ratio (recap).

- The US has long required banking firms to meet a minimum leverage ratio in addition to a risk-based capital ratio. In the US, the leverage ratio is viewed largely as a backstop to the risk-based capital ratio, and recognizes that banking firms need a certain minimum level of capital to safely conduct operations even when assets are low in risk.
- Leverage Ratio = Total Capital/Total Assets; no off-balance sheet items included
- Regulatory minimum leverage ratio required in US is 4% (see slide 17)

Supplementary Leverage Ratio (The SLR):

- After the 2008/09 financial crisis, international supervisors adopted a leverage ratio for large banking firms worldwide. In the US, the SLR applies only to banking firms with assets over $250 billion in total assets.
- Unlike the US leverage ratio, the SLR includes some off-balance sheet items, including repos, securities borrowings/lending, credit and certain other derivatives, and certain other off-balance sheet exposures.
- Minimum SLR is 3% of total assets (including the off-balance sheet assets noted above).

Enhanced Supplementary Leverage Ratio (The eSLR).

- For the largest banking firms, the US adopted an *enhanced* Supplemental Leverage Ratio that is a buffer like the CCB.
- The eSLR applies only to GSIBs and to banks with total assets greater than $700 billion or $10 trillion in assets under custody—currently 8 banking firms.
- GSIBs must maintain an eSLR buffer of at least 2% above the minimum SLR requirement of 3% for a total SLR + eSLR of 5%. Covered IDIs must maintain an eSLR of 3% (for a total SLR + eSLR of 6%) to remain "well-capitalized" for FHC purposes.
- The Federal Reserve and OCC have proposed to change the eSLR to ½ of the GSIB surcharge, which would both make the eSLR variable and lower it for most GSIBs; the Agencies also propose to reduce the SLR for IDIs to 3% + ½ GSIB surcharge applicable to the IDI's parent GSIB. The proposal is still under consideration.

Step 3: A New Approach--using Debt to increase Total Loss-Absorbing Capacity (TLAC)

Going Concern Capital.

- Capital (in particular, CET1 and other types of Tier 1 capital) is most effective in absorbing losses while the firm is operating.
- However, issuing equity is costly and higher capital requirements can become counter-productive. Higher capital requirements can discourage banking firms from lending—they may choose to meet higher capital requirements by refraining from or even reducing credit in order to control asset growth.

Gone Concern Capital.

- Long-term subordinated debt is very useful in the resolution of a failed firm—that is once a firm is "gone." In resolution, subordinated debt can be converted into equity in a re-structured banking entity.
- Debt—especially long-term debt that is subordinated to the claims of other creditors--can also serve a limited loss-absorbing role. After all equity is lost, unsecured subordinated debt begins to absorb losses before other, senior forms of debt.
  - However, debt holders can also force a firm into resolution if debts are not paid in a timely fashion—so the loss absorbing capacity of debt is limited.

TLAC Particulars

Who?

- Top-tier BHCs that are GSIBs
- US intermediate holding companies (IHC) of FBOs with at least $50 billion in US non-branch assets

What?

- Total Loss-Absorbing Capacity (TLAC), which is the sum of Tier 1 capital **plus** Eligible Long-term Debt.
- Eligible Long-term Debt (LTD) is unsecured, subordinated debt that is issued to the public (not an affiliate), has a maturity greater than one year, does not have acceleration rights, and is convertible into common equity.

To what purpose? Eligible Long-term Debt will be converted into common shares of the firm during the resolution process.

How much?

- LTD in an amount greater than 6% of total risk weighted assets plus the applicable GSIB surcharge.
- TLAC must be an amount greater than or equal to 18% of total risk-weighted assets; a separate TLAC requirement also applies based on the company's leverage.
- TLAC buffer roughly equal to the sum of the CCB buffer and the applicable GSIB surcharge.
- Lower (and more complex) TLAC requirements apply to an IHC (intermediate holding company) of an FBO (and allow the IHC to issue internal TLAC to its FBO parent).

Risk-based Capital/LTD/TLAC Minimum Requirements

Risk-based Minimum requirement	Category	Components	Legal Type
TLAC buffer equal roughly to CCB plus GSIB (5.5% or more)	TLAC Buffer	TLAC buffer must be CET1	Outside PCA
18% (Required minimum)	TLAC	Tier 1 capital plus Long-Term Debt	Outside PCA
6% plus GSIB buffer (7% to 9.5%) (Required min)	Long-Term Debt	Unsecured debt with greater than 1-year term	Outside PCA
1% to 3.5%	GSIB Surcharge	CET1	Outside PCA
2.5% (higher if CCyB activated)	CCB/CCyB Buffer	CET1	Outside PCA
8%	Total Capital	Tier 1 capital plus Tier 2 capital	PCA
6%	Tier 1 Capital	CET1 plus noncumulative perpetual preferred stock	PCA
4.5%	CET 1	Common Equity plus Retained Earnings	PCA

Proposed Basel III Endgame

In 2023, the Federal Reserve, the OCC and the FDIC jointly proposed revising capital requirements for large banking firms and their DIs. Among other things, the proposal would:

- Replace reliance on internal bank models for calculating risk weights for various credit, operational and market risks allowed under the Basel II Advanced Approaches with new Enhanced Standardized risk weights ("expanded risk-based approach" or ERB approach) mostly established by the supervisors.
- Apply the new ERB approach uniformly to all banking firms with total assets of $100 billion or more, not just GSIBs and near-GSIBs (so-called, Category I and Category II banking firms).
- Apply the Supplementary Leverage Ratio requirement and the Counter-cyclical Capital Buffer (if activated) to banking firms in Category IV (i.e., expand application of the SLR and CCyB to all banking firms with total assets of $100 billion or more).
- Subject all banking firms with more than $100 billion in total assets (so-called Category III and Category IV banking firms) to the same treatment of accumulated other comprehensive income (AOCI) treatment as GSIBs, including requiring adjusting capital for unrealized losses and gains on available-for-sale securities in the calculation of common equity Tier 1 capital.
- Make a small adjustment to the calculation of GSIB qualification requirements and tiering.
- Revise various reporting and disclosure requirements.

Costs and benefits of Basel III Endgame

In General. The Basel III Endgame proposal was very controversial and strongly opposed by the banking industry. It is under review and unlikely to be completed in the near term.

Benefits:

- Requiring higher capital levels at banking firms improves their resiliency in good and bad economic times.
- Better accounting for losses on trading activities and available-for-sale assets directly addresses a cause of failure of banks during times of changing market interest rates (e.g., the events that caused the failure of Silicon Valley Bank).
- Reducing reliance on internal bank models reduces the potential for gaming of capital needs by banking firms and allows better comparison of bank capital across banking firms.

Costs: Increasing capital requirements:

- Increases costs for banking firms, diminishing returns to investors and making capital more expensive and difficult to raise.
- Increases the costs of generating new assets, which will likely be passed on to consumers and businesses in the form of higher rates on loans, lower returns on deposits and higher fees.
- May reduce the availability of credit if firms reduce assets (and/or slow asset growth) instead of raising more capital.
- May drive some activities out of banking firms and into unregulated non-banking firms, increasing systemic risk and reducing transparency into market activity.
- May reduce competition and liquidity in certain markets.

A Tool to protect Large Firms from Failure: Liquidity Standards

What is liquidity? The ability of a firm to pay its obligations as they come due. For example, does the banking firm have sufficient cash, US government securities, other readily marketable assets and quick access to other forms of cash to--

- Pay its depositors as they seek withdrawals (both retail and wholesale)?
- Repay loans from creditors? Pay its taxes?
- Meet its collateral calls on its derivative contracts?
- Return collateral it used in securities borrowing and lending transactions?
- Fund its activities if others refuse to continue to lend to the firm?

Why is liquidity important?

- A firm that cannot repay its debts (liabilities) as they come due can be forced into bankruptcy by its creditors or by the FDIC (in the case of an insured depository institution).
- Illiquidity was the biggest cause of failures of large financial firms during the 2007-9 financial crisis; Lehman failed and Bear Stearns and AIG nearly failed because they could not liquidate assets fast enough to pay off counter-parties as demanded.
- A firm can be adequately capitalized—i.e., its financial statements may show that the value of its total assets exceeds the value of its total liabilities--but be illiquid and, consequently, insolvent, because the firm cannot realize the value of its assets when needed to repay its liabilities.

JP MorganChase, Cash Obligations, 2020

Contractual cash obligations

By remaining maturity at December 31, (in millions)	2020					2019
	2021	2022-2023	2024-2025	After 2025	**Total**	Total
On-balance sheet obligations						
Deposits[a]	$ 2,134,256	$ 4,321	$ 2,931	$ 1,637	$ 2,143,145	$ 1,558,040
Federal funds purchased and securities loaned or sold under repurchase agreements	214,881	118	9	189	215,197	183,675
Short-term borrowings[a]	28,514	–	–	–	28,514	35,107
Beneficial interests issued by consolidated VIEs	14,976	2,400	–	223	17,599	17,874
Long-term debt[a]	22,461	42,084	42,180	123,477	230,202	250,415
Operating leases[b]	1,606	2,705	2,070	3,602	9,983	10,090
Other[c]	8,694	2,237	2,008	2,592	15,531	15,568
Total on-balance sheet obligations	2,425,388	53,865	49,198	131,720	2,660,171	2,070,769
Off-balance sheet obligations						
Unsettled resale and securities borrowed agreements[d]	95,084	1,764	–	–	96,848	117,951
Contractual interest payments[e]	6,071	10,450	8,128	29,719	54,368	54,681
Equity investment commitments	286	–	–	–	286	539
Contractual purchases and capital expenditures	1,968	942	225	198	3,333	2,929
Obligations under co-brand programs	333	530	240	79	1,182	1,548
Total off-balance sheet obligations	103,742	13,686	8,593	29,996	156,017	177,648
Total contractual cash obligations	$ 2,529,130	$ 67,551	$ 57,791	$ 161,716	$ 2,816,188	$ 2,248,417

JPMorganChase Annual Report, 2020, Form 10-K Supplement, page 61

What are the liquidity requirements?

Three General Requirements.

- Qualitative. Liquidity policies, planning, and governance;
- Internal Quantitative. Liquidity stress-testing, limits and buffers;
- Regulatory Quantitative. Minimum Liquidity Coverage Ratio (LCR) requirement.

Liquidity Management: Qualitative Requirements

Systems. Comprehensive and accurate systems for monitoring the level of outflows, inflows, encumbered and unencumbered collateral, and liquid assets across the entire organization;

The board of directors. The board of directors of a covered BHC must approve the level of liquidity risk that the firm may assume in connection with its operating strategies; review the liquidity risk management strategies, policies, procedures and contingency plans established by senior management; and ensure that senior management operates the banking firm in accordance with the liquidity risk tolerance levels set by the board of directors.

Senior management. Senior management is responsible for—

- Developing and implementing liquidity risk strategies, policies, reporting systems and stress testing methodologies;
- Monitoring cash flow and compliance with liquidity risk limits;
- Maintaining the appropriate size and composition of the firm's liquidity buffer;
- Approving new products and business lines that could have a significant effect on the company's liquidity risks;
- Monitoring the location of liquid assets within the firm and implementing a system for moving liquidity to the entity within the firm that needs liquidity when it needs liquidity;
- Contingency planning.

Liquidity Management: Internal Quantitative Requirements

Stress testing liquidity needs. Each covered BHC must test its ability to cover its debt obligations over different time-horizons and different conditions.

- Time horizons. Overnight, over a period of 30 days, over a period of 90 days, over a one-year period, and other periods as appropriate;
- Conditions. Normal conditions, difficult market/economic conditions, difficult conditions idiosyncratic to the BHC/IDI, a combination of bad market and bad idiosyncratic conditions;

Liquidity reserves and plans. Based on these internal liquidity stress tests, the firm must then determine how it will meet these various stressed liquidity needs and establish reserves of liquidity, appropriate systems, and policies for ensuring it meets these liquidity needs.

- For example, which assets would the firm sell to raise liquidity at various times and what steps must be taken to enable the sale of those assets? How will long-term obligations be repaid?

Regulatory requirements: A Liquidity Buffer and A Liquidity Coverage Ratio (LCR)

Liquidity Buffer. All US banking firms with more than $100 billion in total assets must periodically determine the firm's liquidity needs for the upcoming 30-day period.

- By rule, the firm must maintain sufficient High-Quality Liquid Assets (HQLA) to meet any shortfall between out-flows to pay obligations and in-flows from operations projected for the up-coming 30-day time horizon.
- **HQLA** includes cash, central bank reserves, and unencumbered, easily saleable assets like US Govt securities, certain foreign sovereign debt, and limited amounts of highly rated corporate bonds and publicly traded equity securities.

Liquidity Coverage Ratio. GSIBs and other banking firms with more than $250 billion in total assets or with large short-term wholesale funding exposures must meet a special additional test called the Liquidity Coverage Ratio (LCR)--

- HQLA must be sufficient to meet the **net** liquidity demands for the firm over a 30-day period;
- In calculating net liquidity demands for the LCR, the firm must—
  - Discount (that is, reduce) the expected cash inflows available to pay maturing obligations;
  - Stress (that is, increase) potential cash outflows to account for increased demand for collateral, credit and deposit withdrawals during difficult economic times (for example, wholesale deposit withdrawals, demands for added collateral on derivative positions, and draws on outstanding credit facilities are expected to increase during periods of stress); and
  - Add a buffer at least equal to the largest single day net outflow deficit during the 30-day period to address funding mismatches.
- The LCR is adjusted to be larger for GSIBs and firms with more than $700 billion in assets, and somewhat less for firms with assets between $250 billion and $700 billion.
- The LCR must be measured on a daily basis, and the appropriate level of HQLA adjusted daily.

Consequence of Failing to meet the LCR Requirement

Basic assumption for use of the LCR.

- Liquidity needs are hard to predict because they depend on public reaction to stressful economic times and some liquidity needs will be unexpected—for example, additional high-quality assets may be needed as collateral for derivatives positions during sudden changes in economic conditions.
- The Federal supervisors expect banking firms to use the liquidity buffer that the various LCR-requirements provide during periods of severe economic stress, and quickly replenish any shortfall.

Consequences.

- Banking firms subject to the LCR requirement must report any shortfall to the supervisory Agency and are expected to quickly correct the shortfall.
- Repeated or foreseeable shortfalls may, however, result in an enforcement action by the Supervisory Agency, if appropriate.

Questions for thought

About Capital requirements.

- What are the costs of capital?
- Do higher capital requirements distort the behavior of banking forms? E.g., do they lead to reduction in the availability of credit? Do they drive banks to perform more nonbanking functions?
- When are Capital requirements too high?
- Do the benefits of higher capital requirements outweigh the costs of those requirements?

About Liquidity requirements.

- Should access to the Federal Reserve discount window count as Liquidity? For DIs? For BHCs?
- Do liquidity requirements reduce the benefits of bank intermediation and maturity transformation?
- Do liquidity requirements distort the markets for HQLA, such as US government securities and GSE guaranteed MBS?

Appendix

Sources of the Capital Requirements of Banking Organizations

- OCC capital rules governing national banks: 12 CFR Part 3
- Federal Reserve rules governing capital requirements for BHCs, FHCs and state member banks:
  - 12 CFR 225, Appendices A and C to Regulation Y,
  - 12 CFR 217 (Regulation Q)
- Federal Reserve rules governing stress tests and other enhanced prudential standards:
  - 12 CFR 252 (Regulation YY)
- FDIC rules governing state non-member banks: 12 CFR Part 324.

Sources of the Liquidity Requirements of Banking Organizations

Agency Rules governing the Liquidity requirements for banking organizations

OCC (for National Banks): 12 CFR Part 50

Federal Reserve (for State Member Banks and Bank Holding Companies)

- For Banking organizations with $250 billion or more in total assets: 12 CFR 249 (Regulation WW)
- For Banking organizations with less than $250 billion, but more than $100 billion in total assets: 12 CFR 252.34 and 35 (Regulation YY)
- For Foreign Banking Organizations operating in the US: 12 CFR 252 144, 145, 156 and 157 (Regulation YY).

FDIC (for State non-member Banks): 12 CFR 329