Lecture 7

INSTITUTE OF ACTUARIAL & QUANTITATIVE STUDIES

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Subject : Basel

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Chapter: Unit 4 Chapter 1

Chapter Name: Basel III

Today's Agenda

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1 Why was Basel III introduced?

In addition to the need for more capital for risks in the trading book, the crisis revealed many other weaknesses of the Basel II framework:

- In the depths of the crisis, market participants cared only about tangible Tier 1 common equity capital (i.e., capital that could absorb losses and maintain a bank as a going concern). Many elements of the pre-crisis definition of capital proved limited in their ability to maintain banks as going concerns.

- The official sector came to believe that distress at some banks posed greater threats to society than distress at other banks, and that those in the former category should be better able to manage distress. Categories of "systemically important" financial firms were created and embedded in a wide range of regulatory and supervisory practices.

- Risk-based capital ratios were thought to have been too susceptible to gaming. Leverage-ratio capital requirements were needed as a backstop, especially since market participants who focused only on tangible common equity tended to also focus only on leverage ratios.

1 Why was Basel III introduced?

- It was not enough for banks to remain solvent up to the point of maximum losses – they also had to be able to operate as a going concern thereafter, which meant they needed substantial capital after absorbing the losses. In many cases, governments provided capital, but such provision was unpopular. Buffers of capital above the minimum requirements were needed, as were means of recapitalizing failed banks.

- Entities that were thought to be solvent by regulators nevertheless suffered runs and, in some cases, failed. This was in part because their liquid reserves proved inadequate to cover withdrawn funding and in part because wholesale funding proved to be unstable. Thus, liquidity requirements were needed.

- Especially after the failure of Lehman, which did not honor its commitments as a counterparty in derivative contracts, it became clear that capital was needed to cover counterparty credit risk.

1 Why was Basel III introduced?

- In addition, a Large Exposures Framework was created in 2014 to set a common global standard to limit exposure concentrations to a single counterparty, particularly between systemically important institutions. Specifically, there limits are 25% of capital (and 15% between global systemically important banks). This framework assumes 100% probability of default and 100% loss given default (after netting and collateral adjustments), limited use of models that failed in the crisis, and aggregates across wholesale credit, trading and other books. LEF also addresses a limitation of the capital framework, which does not adjust capital requirements for significant concentrations under either the Standardized Approach or the Gordy Model used in IRB (which assumes exposures are granular, not concentrated).

Proposals to remedy the deficiencies were published in 2010 and 2011 and amended in later years.3

2 Basel III Capital requirements

Basel III eliminated Tier 3 Capital and divided Tier 1 Capital into Tier 1 Equity Capital (also known as Core Tier 1 Capital) and Additional Tier 1 Capital, restricting the former to high-quality capital.

Minimum capital requirements were also changed:

- Core Tier 1 must be at least 4.5 percent of risk-weighted assets,
- Total Tier 1 (i.e., the sum of Core and Additional Tier 1) capital must be at least 6 percent of risk-weighted assets.
- The Total Capital requirement (Tier 1 plus Tier 2) was left unchanged at 8 percent.

2.1 Components

Tier 1 Equity Capital includes
- common equity,
- retained earnings, and
- a limited amount of minority interest and unrealized gains and losses.

Goodwill and other intangibles are deducted, as are deferred tax assets and any shortfall of reserves relative to IRB expected losses.

Additional Tier 1 Capital includes:
- Unsecured, unguaranteed, non-cumulative perpetual preferred equity instruments subordinated to depositors and subordinated debt, and callable only after five years or more.
- Debt with appropriate triggers that cause conversion to equity or write-downs.
- Approved minority interest not included in Core Tier 1.

2.1 Components

Tier 2 capital is designed to absorb losses after failure, protecting depositors and other creditors. It includes:

• Subordinated debt. Specifically, unsecured, unguaranteed, debt instruments subordinated to depositors and subordinated debt, with five years or more original maturity, and callable only after five years or more.

• General loan loss reserves. These are reserves not allocated to absorb losses on specific positions. Reserves included in capital are capped at 1.25% of standardized approach RWAs, or 0.6% of IRB RWAs.

A number of other deductions are required, such as

• defined-benefit pension plan deficits,

• certain cross-holdings within a group, and

• mortgage servicing rights greater than 10 percent of common equity.

Overall, capital requirements were significantly increased relative to Basel 2 because minimum ratios were increased, and allowable capital was constricted.

3 Capital Conservation Buffer

- The capital conservation buffer is meant to protect banks in times of financial distress.
- Banks are required to build up a buffer of Tier 1 equity capital equal to 2.5% of risk-weighted assets in normal times, which will then be used to cover losses in stress periods. This means that in normal times a bank should have a minimum 7% Tier 1 equity capital ratio (i.e., 4.5% + 2.5% = 7.0%). Total Tier 1 capital must be 8.5% of risk-weighted assets and Tier 1 plus Tier 2 capital must be 10.5% of risk-weighted assets in normal periods.
- Banks need an extra cushion against loss during stress periods. The idea behind the buffer is that it is easier for banks to raise equity capital in normal periods than in periods of financial stress.
- The buffer will be phased in between January 1, 2016, and January 1, 2019.
- Dividend payments are constrained when the buffer is wholly or partially used up. For example, if a banks Tier 1 equity capital ratio is 6%, the bank must retain a minimum of 60% earnings, thus dividends cannot exceed 40% of earnings.

3 Capital Conservation Buffer

Dividend Restrictions Resulting From the Capital Conservation Buffer

Tier1 Equity Capital Ratio	Minimum Percentage of Retained Earnings
4.000% to 5.125%	100%
5.125% to 5.750%	80%
5.75% to 6.375%	60%
6.375% to 7.000%	40%
> 7.0%	0%

3.1 Countercyclical Buffer

- Basel III recommends that banks have a capital buffer to protect against the cyclicality of bank earnings, called the counter cyclical buffer.
- The countercyclical buffer can range from 0% to 2.5% of risk weighted assets.
- Like the capital conservation buffer, it must be met with Tier 1 equity capital.
- The buffer will be phased in between January 1, 2016, and January 1, 2019.
- For countries that require the countercyclical buffer, dividend restrictions may apply.

3.1 Countercyclical Buffer

Dividend Restrictions Resulting From the Capital Conservation Buffer and a 2.5% Countercyclical Buffer

Tier 1 Equity Capital Ratio	Minimum Percentage of Retained Earnings
4.50% to 5.75%.	100%
5.75% to 7.00%.	80%
7.00% to 8.25%.	60%
8.25% to 9.50%.	40%
> 9.5%.	0%

4 Liquidity Risk Management

- In the wake of the 2007 - 2009 financial crisis, one of the primary goals of Basel III is to improve liquidity risk management in financial institutions. Basel III specifies a minimum leverage ratio (capital / total exposure) of 3%.

- As of the 2010 Basel III publication date, the type of capital required to calculate the ratio was not decided. Total exposure includes all items on the balance sheet, in their entirety (i.e., not risk-weighted). It also includes some off balance sheet items such as loan commitments.

- Banks often finance long-term obligations with short-term funds such as commercial paper or repurchase agreements. This is fine during normal economic periods. However, in times of financial stress, this mismatched financing gives rise to liquidity risk. Banks find it difficult to roll over the short-term financing when they have, or are perceived to have, financial problems.

- During the 2007 - 2009 financial crisis, liquidity risk, not a lack of capital, was the real problem for many banks (e.g., Lehman Brothers).

4 Liquidity Risk Management

Basel III requires banks to meet the following two liquidity ratios:

- Liquidity coverage ratio and
- Net stable funding ratio.

4.1 Liquidity Coverage Ratio (LCR)

The LCR focuses on the banks ability to weather a 30 day period of reduced/disrupted liquidity.

The severe stress considered could be a three-notch downgrade (e.g., AA to A), a loss of deposits, a complete loss of wholesale funding, a devaluation of the value of collateral for funding agreements like repurchase agreements (i.e., increased haircuts), and potential draw downs on lines of credit.

The ratio is computed as:

high quality liquid assets / net cash outflows in a 30-day period $\geq 100\%$

Liquid assets need to be at least as great as potential net cash outflows such that the bank can withstand one or more of the pressures described earlier.

4.2 Net Stable Funding Ratio (NSFR)

The NSFR focuses on the banks ability to manage liquidity over a period of one year.

The ratio is computed as:

amount of available stable funding / amount of required stable funding ≥ 100%

To calculate the numerator, each source of funding (such as retail deposits, repurchase agreements, capital, and so on) is multiplied by a factor that reflects the relative stability of the funding source. Check the following table for the available stable funding (ASF) factors and types of funding available.

To calculate the denominator, each required amount of stable funding is multiplied by a factor that reflects the relative permanence of the funding required. Check the following table for the required stable funding (RSF) factors and the types of assets requiring the funding.

4.2 Net Stable Funding Ratio (NSFR)

ASF Factors in NSFR

ASF Factor	Category
100%	Tier 1 and Tier 2 capital, preferred stock, debt with remaining maturity greater than one year.
90%	Stable demand and term deposits from individuals and small businesses with maturities less than one year.
80%	Less stable demand and term deposits from individuals and small businesses with maturities less than one year.
50%	Wholesale funding (demand and term deposits) from nonfinancial corporations, sovereigns, central banks, multi-lateral development banks, and public sector entities with maturities less than one year.
0%	All other liability and equity categories.

4.2 Net Stable Funding Ratio (NSFR)

RSF Factors in NSFR

RSF Factor	Category
0%	Cash and short-term instruments, securities, and loans to financial entities with residual maturities of less than one year.
5%	Marketable securities with maturities of greater than one year, if claim is on a sovereign with 0% risk weight (e.g., U.S. Treasury securities).
20%	Corporate bonds with rating of AA or higher and residual maturity greater than one year. Claims on sovereigns or similar bodies with risk-weight of 20%.
50%	Gold, equities, bonds rated A+ to A.
65%	Residential mortgages.
85%	Loans to small businesses or retail customers with remaining maturities less than one year.
100%	All other assets.

4 Example

A bank's liabilities consist of USD 500 of stable retail deposits with 9 months or less remaining maturity, USD 200 of 3-month wholesale certificates of deposit with one-third maturing each month, USD 200 of 10-year senior bonds with none maturing in the next year, and USD 100 of common equity. ASF factors for these categories of liability are 95%, 0%, 100%, and 100%, respectively.

The bank's assets consist of USD 100 of vault cash, USD 100 of the debt of its sovereign, USD 100 of corporate debt securities rated BBB in the trading account, and USD 700 of loans to businesses with more than one year of remaining maturity and risk weights of 50% or more. The RSF factors for these assets are 0%, 5%, 50%, and 85%, respectively. Thus,

$$NSFR = \left(\frac{475 + 0 + 200 + 100}{0 + 5 + 50 + 595} \right) = 1.19$$

4 Example

For the LCR, HQLA factors (1-haircut) are 100%, 100%, 50%, 0 %, presuming the supervisory allows inclusion of the corporate debt securities. Note that the corporate debt securities are Level 2 assets, which may not comprise more than 40% of HQLA after the haircut. This is satisfied since total HQLA is USD 250, of which USD 50 is the corporate debt securities.

Using a 5% runoff rate for the stable retail deposits, a 100% runoff rate for the one-third of wholesale CDs that mature in the next month, and a 0 % runoff rate for senior bonds and equity, net 30-day cash outflows are 25 + 67 = 92, so

$$LCR = \left(\frac{250}{92} \right) = 2.72$$

Thus, the bank in this example would be in compliance with the LCR and NFSR. Note that a very large number of categories, factors and haircuts were not discussed in this example and the liquidity requirements are operationally complex.

5 Basel IV

Basel IV is a regulatory standard for banks that aims to increase financial stability by strengthening the supervision, practices, and regulations of banks worldwide. It was finalized in December 2017 by the Basel Committee on Banking Supervision and is due to be implemented from January 2022.

The December 2017 agreement included substantial amendments to the capital treatment of credit risk, operational risk and the credit valuation adjustment, the imposition of an output floor, revisions to the definition of the leverage ratio and the application of the leverage ratio to global systemically important banks. A revised market risk framework had already been largely finalised in January 2016.

5.1 Basel IV – Changes

Credit risk

Key elements of new standards:

- Standardised approach more granular and risk sensitive
- Removing the option to use advanced IRB for institutions and large corporates, and any IRB approach for equity
- Restrictions on model parameters (input floors)

Implementation date[1]: 1/1/2022

Impact on capital requirements:

Higher capital requirements - in particular on higher risk exposures, income producing real estate, and where IRB no longer available

Market risk

Key elements of new standards:

- Stricter border between Trading and Banking books
- More risk-sensitive Standardised Approach (SA)
- Revised Internal/Advanced Model Approach (IMA)
- Replacement in IMA of VaR measure by the expected shortfall measure

Implementation date[1]: 1/1/2022

Impact on capital requirements:

Higher capital requirements, most pronounced under the revised standardised approach

5.1 Basel IV – Changes

Credit valuation adjustment

Key elements of new standards:

- New basic approach (BA-CVA) and new standardised approach (SA-CVA) for CVA risks in derivatives and securities financing transactions
- Enhance risk sensitivity, improve robustness and greater consistency with market risk framework

Implementation date[1]: 1/1/2022

Impact on capital requirements:

Higher capital requirements, mostly from removal of more advanced modelling approaches

Operational risk

Key elements of new standards:

- Withdrawing the use of internal model-based approaches
- Single Standardised Measurement Approach (SMA)
- Business indicators, increasing marginal coefficients, internal loss multiplier

Implementation date[1]: 1/1/2022

Impact on capital requirements:

Higher capital requirements – in particular for larger banks, banks with high historic operating losses, and banks moving from the AMA

5.1 Basel IV – Changes

Output floor

Key elements of new standards:

- Floor to constrain the extent to which banks can use internal models to drive down their capital requirements for credit and market risk
- Calibrated to 72.5% of RWAs under Standardised approaches

Implementation date[1]:

Phased in from 1/1/2022 to 1/1/2027

Impact on capital requirements:

Higher capital requirements, with most pronounced impact from 2025 onwards

Leverage ratio

Key elements of new standards:

- Revised exposure definition (derivatives, some off-balance sheet items and holdings of reserves at central banks)
- G-SIB leverage ratio buffer (set at half of a G-SIB's capital ratio buffer)

Implementation date[1]:

- Current definition from 1/1/18
- Revised definition and G-SIB buffer 1/1/2022

Impact on capital requirements:

Lower capital requirements – definition changes generally increase measured leverage ratios, and more than offset the impact of the G-SIB buffer

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