Topics to be covered

- Part I: Procyclicality in banking
- Part II: Non-traditional banking activities
  - a) Off-balance sheet leverage vs. On-balance sheet leverage
  - b) Securitisation
- Part III: Bank regulation
- Part IV: The systemic view of the banking system
  - a) Bank runs
  - b) Systemically important financial institutions
  - c) Systemic risk
  - d) Contagion
  - e) Bank rescues
- Part V: Banking and the Macroeconomy
Topics to be covered (cont’d)

• Part V: Banking and the Macroeconomy
  a) Money: definition, types, and functions of money
  b) Liquidity
  c) Money Supply
  d) The Quantity Theory of Money
  e) The main tasks of Central Banks
Part I: Procyclicality in banking

Procyclicality refers to the mutually reinforcing interactions between the financial and real sectors of the economy that tend to amplify business cycle fluctuations and cause or exacerbate financial fragility. This is why supervisory and regulatory authorities are so much concerned in mitigating the degree of procyclicality of the financial sector.

Procyclicality in:

• Profitability
• Risk measurement
• Capital adequacy requirements
• Loan loss provisioning system
• Credit ratings
Part I: Procyclicality in banking

The treatment of procyclicality regards the macroprudential (or systemic) orientation of regulatory and supervisory policies, which focuses on avoiding damage to the financial system as a whole with an eye to the impact on the real economy. This orientation is in contrast to the microprudential focus on individual institutions and markets, which assumes that the stability of the system derives from the stability of its components.

The main policy target in dealing with the procyclical patterns in the financial system is to calibrate prudential instruments so that systemic buffers are created during the upswing of the cycle that can subsequently be used to limit the costs of financial distress during contraction phase.
Part II: Non-traditional banking activities

Over the past couple of decades or more, the extensive regulatory changes and the technological advances have transformed financial systems to a great extent. Banks have reacted to the challenges posed by the new operating environment by creating new products and services and expanding the already existing ones, which allowed them to diversify the product mix of their portfolio.

The traditional business of taking deposits from households and making loans to agents that require capital has thus declined in favour of a considerable growth in activities that generate noninterest (fee) income and are not necessarily reported on banks’ balance sheets.
On-balance sheet leverage vs. Off-balance sheet leverage

The use of balance-sheet elements to finance some investment. It is expected that the investment project will produce higher returns compared to the interest rate paid, that is:

\[ E(R) > r \]  \hspace{1cm} (1)

If (1) does not hold or when a loan fails, the bank resorts to its equity. Should bad loans accumulate, equity capital would disappear.

Overall:
bank’s asset position → riskiness of bank’s balance sheet equity
The transfer of leverage off-the-balance sheet through modern financial activities.

*Before the outbreak of the crisis:*
To free up more capital and originate more assets banks transferred some part of their leverage to conduits and SIVs providing them liquidity and credit backstops.

*After the outbreak of the crisis:*
Under the scheme of backstops, investors in vehicles would return the assets back to the sponsoring banks in case of a loss => risk still burdened the banks. Off-balance sheet leverage is mainly of short-term nature.

It can increase risk:
   a) through the widening of maturity and liquidity gaps that make banks vulnerable to runs (↑ liquidity risk)
   b) by being a high-volatility funding source (↑ funding risk)
Off-balance sheet activities of banks

I. Guarantees and Similar Contingent Liabilities
   1. Guarantees
   2. Acceptances
   3. Transactions with recourse
   4. Standby letters of credit
   5. Documentary letters of credit
   6. Warranties and indemnities
   7. Endorsements

II. Commitments
   1. Irrevocable Commitments
      A. Asset sale and repurchase agreements
      B. Outright forward purchases
      C. Forward deposits
      D. Partly-paid shares and securities
      E. Other standby facilities
      F. Note issuance facilities and revolving underwriting facilities
   2. Revocable Commitments
      A. Credit lines
      B. Undrawn overdraft facilities

III. Foreign Exchange, Interest Rate and Stock Index Related Transactions
   1. Forward foreign exchange transactions
   2. Currency and interest rate swaps
   3. Currency futures
   4. Currency options
   5. Forward rate agreements
   6. Interest rate futures
   7. Interest rate options
   8. Stock index futures
   9. Stock index options
   10. Options on interest rate or currency futures

IV. Advisory, Management and Underwriting Functions
   1. Fiduciary services, such as trust funds and portfolio management
   2. Agency functions
   3. Counter-trade
   4. Safe-keeping of securities
   5. Securities underwriting
Securitisation
(Coval, J., Jurek, J. Stafford, E., The economics of structured finance, JEL 2009)

The essence of structured finance is the pooling of assets like, e.g., loans, bonds, or mortgages, and the subsequent issuance (tranching) of a prioritised capital structure of claims, known as tranches, against these collateral pools. This is to say, structured finance is a two-step procedure involving pooling and tranching. In the first step, a large collection of credit-sensitive assets is pooled in a portfolio, which is typically referred to as a Special Purpose Vehicle (SPV). SPV is then separate in the second step from the originator’s balance sheet to isolate the credit risk of its liabilities -the tranches- from the balance sheet of the originator.

The tranches are prioritized in how they absorb losses from the underlying portfolio. For instance, senior tranches only absorb losses after the junior claims have been exhausted, which allows senior tranches to obtain credit ratings in excess of the average rating on the average for the collateral pool as a whole. Hence, as a result of the prioritization scheme used in structuring claims, many of the manufactured tranches are supposed to be safer than the average asset in the underlying pool.
Part III: Bank regulation

In general, regulation is justified by the market failures emerging from the presence of market power, externalities, and asymmetric information between buyers and sellers.

Regulatory instruments could be classified into six broad categories:

a) Deposit insurance

The combination of a bank capital structure that consists largely of short-term debt (deposits) which is used to finance long-term illiquid loans has made banks traditionally prone to bank runs and banking panics. Deposit insurance and the establishment of a lender of last resort are two classical institutions of banking regulation that have been established to eliminate this inherent instability of fractional reserve banking.
b) Capital requirements:
Capital adequacy requires banks to hold capital as a function of their total assets to serve as a buffer against losses they might incur. Moreover, capital requirements have an indirect incentive effect related to capital structure. In particular, by reducing the relative amount of debt, more capital reduces risk-taking incentives.

c) Deposit interest rate ceilings (controls).
d) Entry, branching, network, and merger restrictions.
e) Portfolio restrictions including reserve requirements and even, as an extreme case, narrow banking.
f) Regulatory monitoring (including not only closure policy but also the use of market values versus book values).

Most, if not all of these instruments can be provided either by taking risk into account (risk-adjusted), or without taking it into account (non-risk adjusted).
Bank runs

A bank run occurs when the customers of a bank fear that their bank will become insolvent, or that the local economy will crash or slow down dramatically. This is likely to cause panic and result in a series of bank runs (simultaneous runs at several banks).

Bank runs can cause serious liquidity problems since banks hold only a small fraction of the value of the deposits in a liquid form.

Bank runs are driven by expectations (based on fundamental bad news about the health of some bank), which in some cases are self-fulfilling (information acquired concerning a bank run under way → it is optimal to also run to the bank due to the first-come first-served principle that dominates the bank deposit system.)
Some remedies for bank runs are the following:

- Narrow banking
- Suspension of convertibility of deposits
- Deposit insurance
- Interbank market
- Lender of Last Resort (LLR)
**Systemically important financial institutions**: the main drivers of systemic importance are a) bank size, i.e., the degree of size concentration in the banking system, b) the level of bank riskiness on a stand-alone basis (e.g., individual credit risk, liquidity risk, etc.), and c) the degree of interconnectedness among banks. The latter driver refers to two distinct yet interrelated parameters: first, the exposure of banks to common risk factors (common activities) which is external to the system, and, second, the exposure of banks to the interbank market that is endogenous and accounts for the well-known domino effects in banking.

**Systemic risk**: the simultaneous failure of a number of institutions which is sufficient enough to destabilize the financial system and, probably, the economy as a whole. The issue of systemic risk is strongly related to the study of the risk allocation problem, where particular attention is paid to the influence of the interdependence between a number of financial institutions and the problem of chain reactions of default triggered by mutually connected credit exposures. It is thus clear why systemic risk can be relevant for regulation.
**Contagion:** The tight network of credit interconnections in the banking system creates a special source of risks that can induce chain reactions emanating from the distress of a few institutions or from macroeconomic shocks that get propagated via the banking system.

**Bank rescues:** Bail-outs of distressed banks are an important tool of financial crisis management, which has been widely used in the current crisis. Despite the detrimental effects that bail-outs have on ex ante incentives of bank owners and managers, ex post interventions are relatively frequent. These rescue operations are usually justified by preventing crises of the entire financial system ex post, because the bailed-out banks are of systemic importance.
Part V: Banking and the Macroeconomy

Money
It is the medium which can be exchanged for goods and services and is utilised as a measure of their values in market transactions. It includes all commonly accepted means of payment like currency (coins and notes), current deposit accounts

- Fiat money: it is used for every day transactions and has almost no intrinsic value.
- Bank money consists of the book credit that banks extend to their depositors. Transactions made using checks drawn on deposits held at banks involve the use of bank money.
- Commodity money: a gold bar, a liter of oil, etc. which all have an intrinsic value.
**Functions of money**
- As a means of exchange in a modern economy: it is used to buy goods and services.
- As a standard of value or monetary unit: the value of goods and services are expressed in monetary units and can be compared with each other.
- As a store of value: money can be saved for future consumption or investment, which is not the case with all commodities.
- As a means of deferred payment: it facilitates the operation of the credit system.

**Purposes of holding money**
- Transaction purposes.
- Precautionary purposes: it refers to the coverage of the emergency costs.
- Speculative purposes (e.g., stocks purchased in the expectation their value will rise and make profit.)
**Liquidity**
The speed and ease with which an asset can be turned into money. Little transaction cost and low price uncertainty are required.
- Fiat money is perfectly liquid.
- A time deposit is less liquid.
- A bank loan is much lesser liquid.

**Money Supply**
It is the quantity of money available in an economy. The government policy that controls the supply of money is the widely known monetary policy. Money supply is measured as follows:
- \( M_1 = \) demand deposits + currency and coins in circulation
- \( M_2 = M_1 + \) savings deposits & other small time deposits + non-institutional money market mutual funds
- \( M_3 = M_2 + \) large time deposits, institutional money-market funds, short-term repurchase agreements & other larger liquid assets.

\( M_1 \) is the most liquid measure of money supply as it includes cash and assets that can quickly be converted to currency.
The Quantity Theory of Money (QTM)

The QTM is an identity which shows that money supply is directly and proportionally linked to level of prices in the economy:

\[ \text{Money Supply (} M \text{)} \times \text{Transactions Velocity of Money (} V \text{)} = \]
\[ = \text{Overall price level (} P \text{)} \times \text{Volume of Transactions (} T \text{)} \]

The ratio \( M/P \) is called real money balances and measures the purchasing power of money.

If \( V \) and \( T \) remain constant, then a change in \( M \) (through a change in monetary policy) will lead to a change in \( P \). That is, the monetary authorities has the ultimate control over the price level which is given by the inflation rate.
The main tasks of Central Banks

- Currency issuance
- Conduct of Monetary Policy
- Maintenance of Financial Stability
- Supervision of banks and other financial institutions
- Lender of banks
- Settlement of transactions amongst banks
- Lender of Last Resort
Monetary policy affects the economy because changes in the money supply affect interest rates, and interest rates affect aggregate demand (AD) by affecting C, Ip, and net X; and the level of AD affects real GDP (Q), the unemployment rate, the price level (P), and the inflation rate.

Changes in monetary policy cause the AD curve to shift. They do not cause the AS curve to shift.

Monetary policy can be:

- expansionary - when the CB increases the money supply and lowers interest rates in order to raise real GDP and reduce unemployment (AD curve shifts out);
- contractionary - when the CB contracts the money supply and raises interest rates in order to reduce inflation (AD curve shifts in);
- neutral - just trying to keep the economy on an even keel, with interest rates and the GDP ratio (Q/Q*) not changing much.
The step-by-step process by which changes in monetary policy affect real GDP and the price level is as follows, considering e.g. the case of an expansionary monetary policy:

1. The CB increases the level of bank reserves, using one of its three tools of monetary policy.
2. Banks loan out their excess reserves to firms (planned investment increases) and households (consumption increases, especially durable goods consumption).
3. As loans are redeposited back into bank accounts (usually after the loan money is spent - i.e., money loaned for the purchase of a new car is deposited by the car dealer into his bank account), the money supply increases, since the money supply is cash plus bank accounts. The bank will loan out most of the new deposits, and those loan monies will be redeposited somewhere else, and the cycle of reserves->loans->deposits->reserves will continue. Eventually the money supply will increase by a multiple of the original increase in reserves.
4. The increase in the money supply (Ms) causes the equilibrium interest rate to fall: increase in Ms $\Rightarrow$ i falls.

5. With lower borrowing costs, and a lower opportunity cost of spending one's money, planned I and durable-goods consumption both increase (lower i $\Rightarrow$ Ip, C of durables both increase). Aggregate demand (AD) increases, since C and I are two key components of aggregate demand.

6. Real GDP (Q) and the price level (P) both increase, since the AD curve shifts out, in most cases moving along the upward-sloping portion of the AS curve (since that is where the economy usually is).
When the CB conducts monetary policy, it directly affects the level of bank reserves, causing banks to have either excess reserves (which they loan out) or a reserve deficiency (which causes them to call in loans). In either case, the supply of money changes by a multiple of the original change in reserves:

\[
\text{money multiplier} = \frac{\text{change in money supply}}{\text{change in bank reserves}} = \frac{1}{\text{RRR}}
\]

Traditionally, a CB has three tools that it uses to conduct monetary policy:

1. changes in the required reserve ratio (RRR), i.e. of the fraction of deposits that banks must keep as cash, Changes in the RRR have large effects on money supply: increasing RRR causes a decrease in banks’ excess reserves and a decrease in the money multiplier \((1/\text{RRR})\), so the money supply decreases by a lot.
(2) changes in the discount rate, i.e. of the interest rate at which the CB makes loans to commercial banks. –When the CB lowers the discount rate, bank reserves will increase, because banks will take advantage of the lower rates by borrowing more reserves from the CB (and then loaning those reserves out).

Although the CB is officially a “lender of last resort” to banks, to be used only when banks are in desperate situations, when it lowers the discount rate it is generally signaling a relaxation of that rule, i.e. an increased willingness to make ordinary loans to banks in order to expand the volume of money and credit.
(3) open market operations (OMO): when the CB buys and sells government bonds on the open market. The CB uses OMO to affect the federal funds rate, which is its mostly widely watched interest-rate target.

When the CB buys or sells government bonds from/to banks, it makes or collects the payment for those bonds by crediting or debiting the banks’ reserve accounts at the CB and thereby changing the level of bank reserves, which changes the money supply in the same direction.

- Expansionary monetary policy calls for open-market purchases: CB buys securities, pays by crediting banks’ reserve accounts => money supply expands, interest rates fall.

- Contractionary monetary policy (open-market sales): CB sells securities, collects payment by debiting banks’ reserve accounts => money supply shrinks, interest rates rise.