

M U N I  
E C O N

# **Banks operations. Bank business models. Current Trends in Banking**

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# Contents

1. Functions of banks.
2. Why banks exist?
3. Types of bank operations.
4. Bank business models.
5. Current trends in banking.

# What is a Bank?

- Banking operations may be varied and complex, but a simple operational definition of a bank is available (usually used by regulators):

**A bank is an institution whose current operations consist in granting loans and receiving deposits from the public.**

- combination of lending and borrowing,
- a public good?

Main **functions of banks**:

- Offering liquidity and payment services
- Transforming assets
- Managing risks
- Processing information and monitoring borrowers

# Liquidity and Payment Services

- Management of **fiat money**:
  - money change (exchange between different currencies issued by distinct institutions)
  - provision of **payment services**
    - management of clients' accounts
    - the finality of payments - the guarantee by the bank that the debt of the payer (who has received the goods or services involved in the transaction) has been settled to the payee through a transfer of money

Checking accounts, credit cards, electronic banking or wire transfers (CHIPS or Clearing House Interbank Payments System, TARGET or Trans-European Automated Real-Time Gross Settlement Express Transfer), international payments (SWIFT or Society for Worldwide Interbank Financial Tele-communication), etc.

# Basic Operations of a Bank

**T-account** is an accounting tool used to show changes in balance sheet items.

Example: You open a bank account with 100 at XYZ Bank.

<b>Assets</b>		<b>Liabilities</b>	
Vault cash	+100	Demand deposits	+100

<b>Assets</b>		<b>Liabilities</b>	
Required reserves	+10	Demand deposits	+100
Excess reserves	+90		

<b>Assets</b>		<b>Liabilities</b>	
Reserves	+10	Demand deposits	+100
Securities	+30		
Loans	+60		

ABC Bank uses its excess reserves to buy bonds worth 30 and make a loan worth 60.

# What is a Bank?

Bank	
Assets	Liabilities
Illiquid Loans	Liquid deposits
Liquid assets	Capital

Corporate	
Assets	Liabilities
Illiquid Machines, Products, Real estate	Debt (mainly from banks)
Liquid assets	Capital

Typical bank balance sheet	
Assets	Liabilities
Cash + Reserves at CB	Equity
Loans	Deposits
Financial instruments (long)	Short-term liabilities
Fixed assets	Long-term debt
<i>Off-balance sheet (receivables)</i>	<i>Off-balance sheet (liabilities)</i>

# What is a Bank?

Assets	Liabilities	Mismatches
10Y CZK term loan, 1 mln	3M EUR term deposit, 0.01 mln	
10 years	3 months	1) Interest rate maturity mismatch
10 years	3 months	2) Liquidity maturity mismatch
CZK	EUR	3) FX mismatch
Defaultable (PD=1%, LGD=50%)	1 € paid in => 1 € paid back	4) Credit mismatch
1 mln	0.01 mln	Amount mismatch
//		
<b>Liquidity reserve</b> (to cover unexpected outflows from sudden deposit withdrawals)	<b>Capital</b> (to absorb losses from IR-, FX-, credit mismatches)	Bank <sup>1</sup> manages mismatch risks 1-4

<sup>1)</sup> More precisely, the Treasury unit within the bank manages these asset-liability mismatches (= ALM risks)

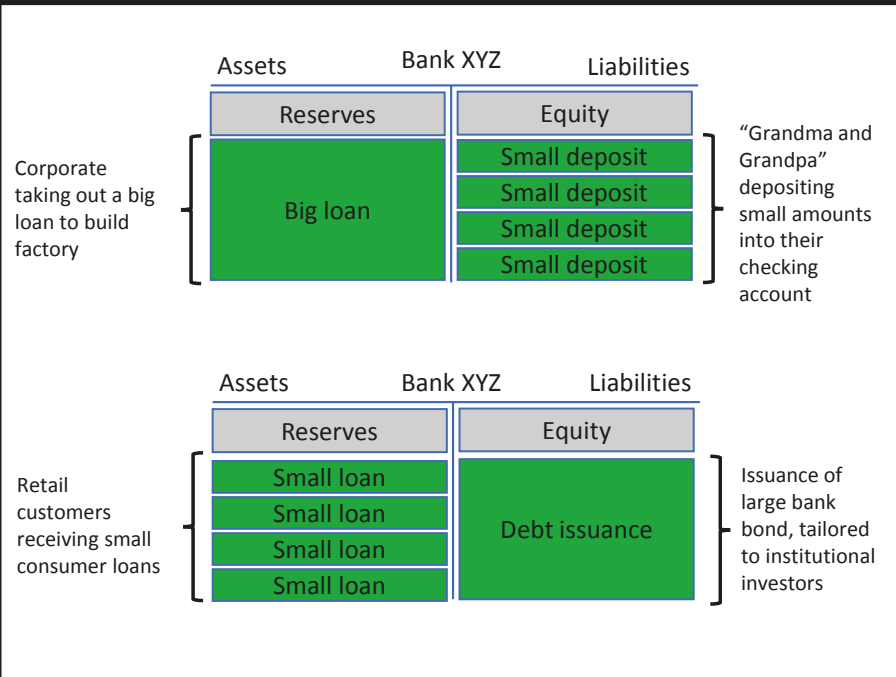
# Asset Transformation

- 1. Convenience of denomination** - bank chooses the unit size (denomination) of its products (deposits and loans) in a way that is convenient for its clients.
- 2. Quality transformation** - occurs when bank deposits offer better risk-return characteristics than direct investments (due to impossibility of diversification or asymmetric information situation).
- 3. Maturity transformation** - banks transforms securities with short maturities, offered to depositors, into securities with long maturities, desired by borrowers.  
→ liquidity risk

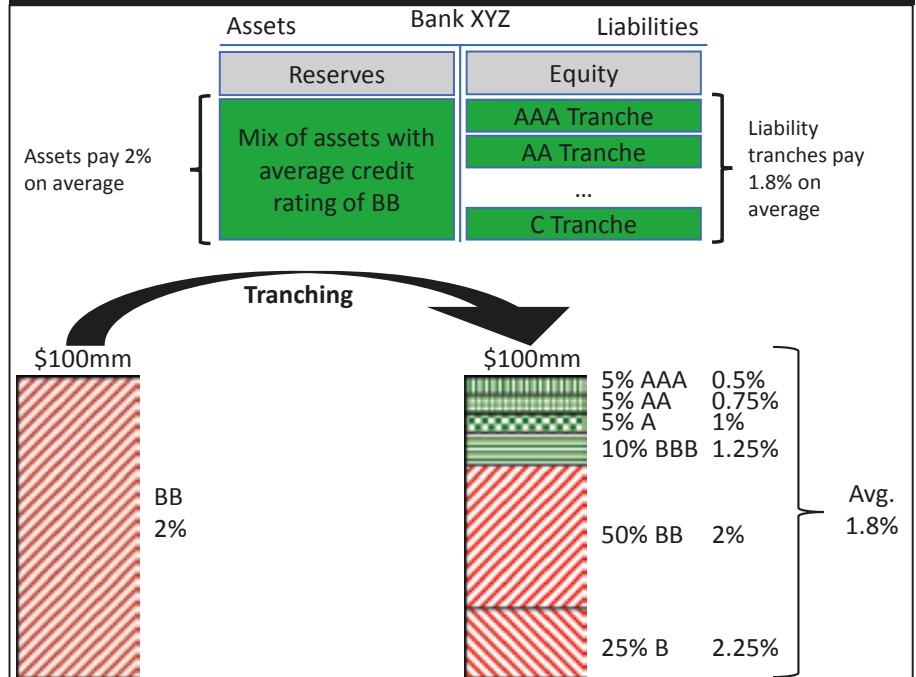


# Asset Transformation

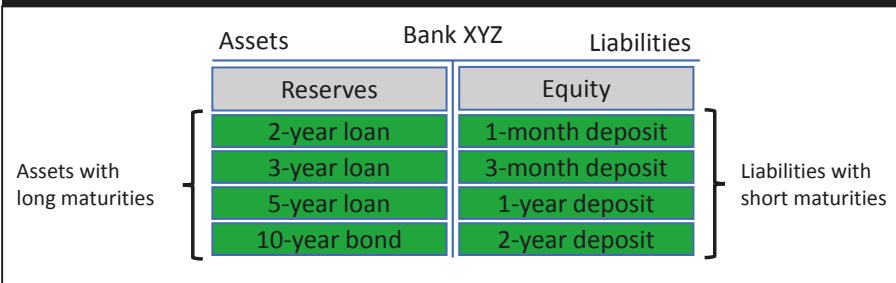
## Size transformation



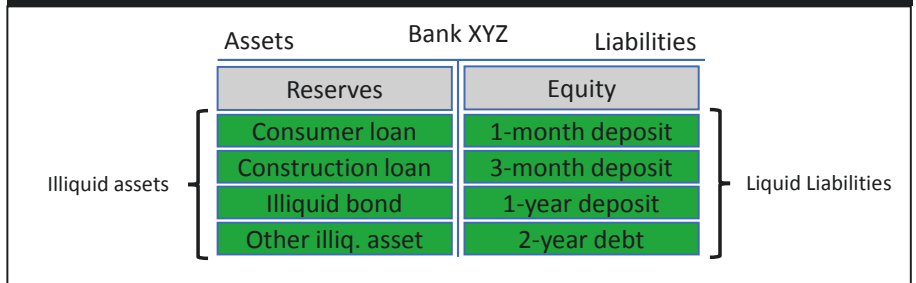
## Credit transformation



## Maturity transformation



## Liquidity transformation



# Risk Management

## – Credit risk

- **Default risk** (borrower defaults) and **migration risk** (borrower's credit worthiness deteriorates, but borrower still does not default)

**EL (expected loss) = PD (probability of default) ×**

**× LGD (loss given default) × EaD (exposure at default)**

- Credit portfolio models: describe portfolio loss distribution, while taking into account diversification

## – Liquidity risks

- Funding/ Roll-over risk: risk of not being able to roll-over funding
- Market liquidity risk: unable to quickly sell an instrument without large discount

# Risk Management

## – Market risk

- Potential losses resulting from movements of market prices like interest rates, credit spreads, FX-rates, stock prices, and commodity prices.
- **Reinvestment risk**: payments before investor's horizon such that proceeds need to be (re-)invested => rate unknown => risk
- **Pre-payment risk**: unexpected early (partial or full) repayments of mortgages
- **Model risk**: arises if (i) instruments are priced with a model (if non-observable market prices) or (ii) risk is measured. Model risk increases with complexity, number of assumptions, shortage of data

## – Off-Balance-Sheet Operations

- loan commitments, credit lines and guarantees
- swaps, hedging contracts, and securities underwriting

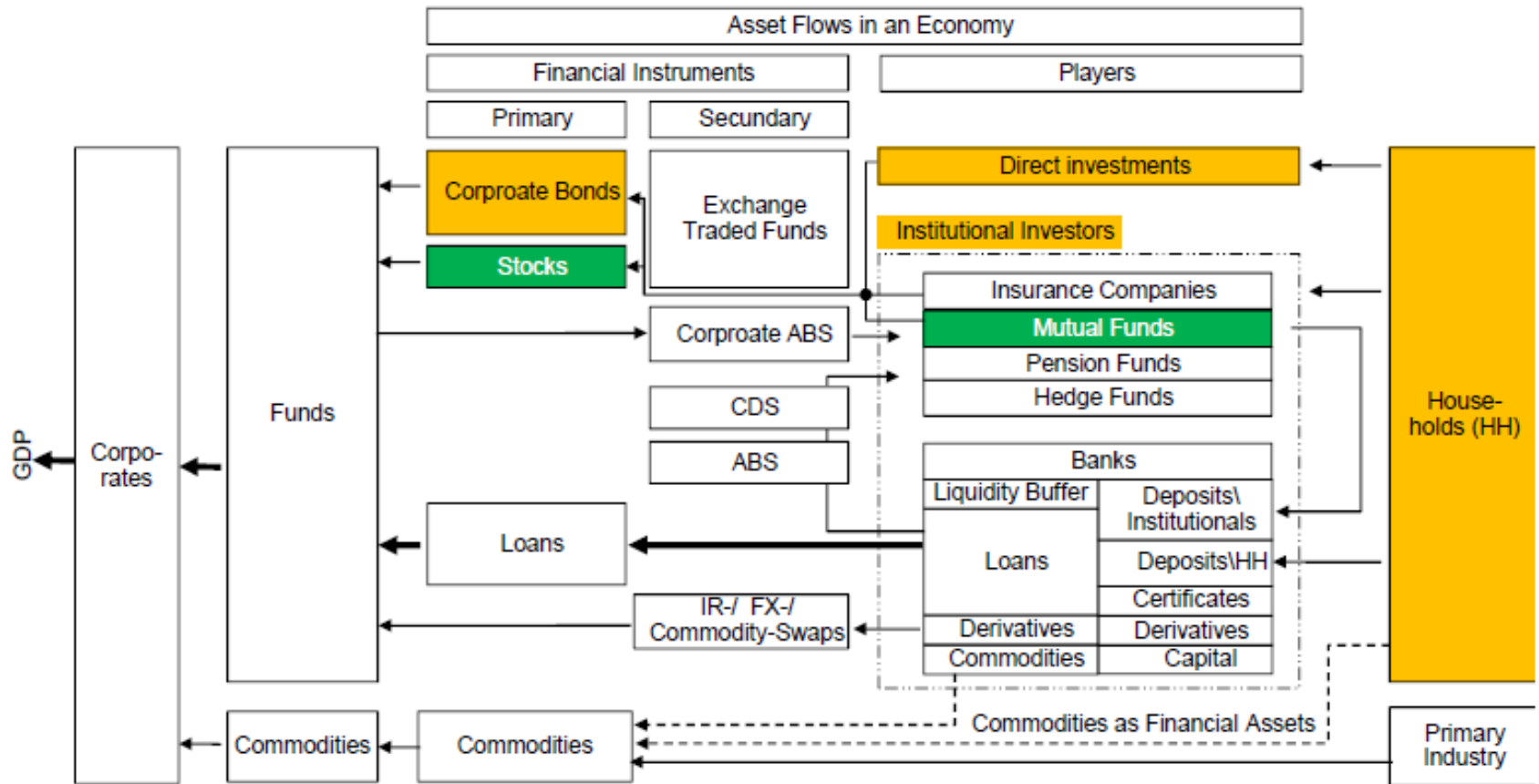
## – Operational risk

- Potential losses arising from 'running the bank': from internal or external fraud, system failure, breaking law, selling wrong product to customers, accidents, ethics, discrimination.

# Monitoring and Information Processing

- **Imperfect information** on borrowers
- Banks invest in the technologies that allow them to screen loan applicants and to monitor their projects.
  - Firms and financial intermediaries develop **long-term relationships**, thus mitigating the effects of moral hazard.
- Compared to security investments, the value of a bank loan results from this long-term relationship and is a priori unknown, both to the market and to the regulator.
- This enhances economic efficiency and welfare ... but at the cost of inherently unstable banks (bank run).

# Where do banks sit in the macro economy?



# Bank business

Bank		
Assets	Liabilities	
Banking book	Banking book	<ul style="list-style-type: none"> <li>• Commercial banking products (loans, deposits, bonds that are held to maturity (hedges/ strategic investm.))</li> <li>• Valued at (initial cost) plus accrued interest (not valued at market prices, even if instrument had market prices)</li> <li>• IFRS: „Held to maturity“</li> <li>• Main source of the asset-liability mismatch risks</li> </ul>
Trading book	Trading book	<ul style="list-style-type: none"> <li>• Items that banks want (have) to trade (buy and sell) =&gt; often „churn“ rule: to be sold <math>\leq</math> 180 days)</li> <li>• Result from market making, proprietary trading, flow trading (for customers)</li> <li>• Daily valued at market-(mark-to-market) (or model prices (mark-to-model) if market prices are unavailable or not credible because very illiquid instrument)</li> <li>• Often derivative instruments</li> </ul>
Liquid assets	Capital	<ul style="list-style-type: none"> <li>• Note: banking- and trading book exist on both balance sheet sides!</li> </ul>

Service or function	Balance sheet	Revenue generated	Risk
<b>Lending</b>			
Retail, commercial, mortgage, project finance	Assets	Interest income, fees	Credit, Market
Trade finance, credit cards	Assets	Interest income, fees	Credit, Market, Operat.
Lending, Syndicated	Assets	Trading, interest income, fees	Credit, Market
<b>Cash Management</b>			
Processing	Asset [balance <0], Liabilities [balance >0]	Fees	Operational
Payments		Fees	Credit, Operational
Custodians	-----	Fees	Credit, Operational
Private banking	-----	Commission income, interest income, fees	Operational
Asset management	-----	Fees, Performance payments	Credit, Market, Operational
<b>Capital markets</b>			
M&A	-----	Fees	
Corporate finance	Assets (if banks lends),	Fees, Interest income (if bank lends)	
Trading (Equities, Foreign exchange, Derivatives)	Assets (long, MV > 0) Liabilities (short, MV<0)	Trading income, fees	Credit, Market, Operational
Trading (Bonds)	Assets (long), Liabilities (short)	Trading income, interest income, fees	
Depositing (Retail, Corporate, Public sector, Interbank)	Liabilities	Interest income	Liquidity risk

# From products to balance sheet

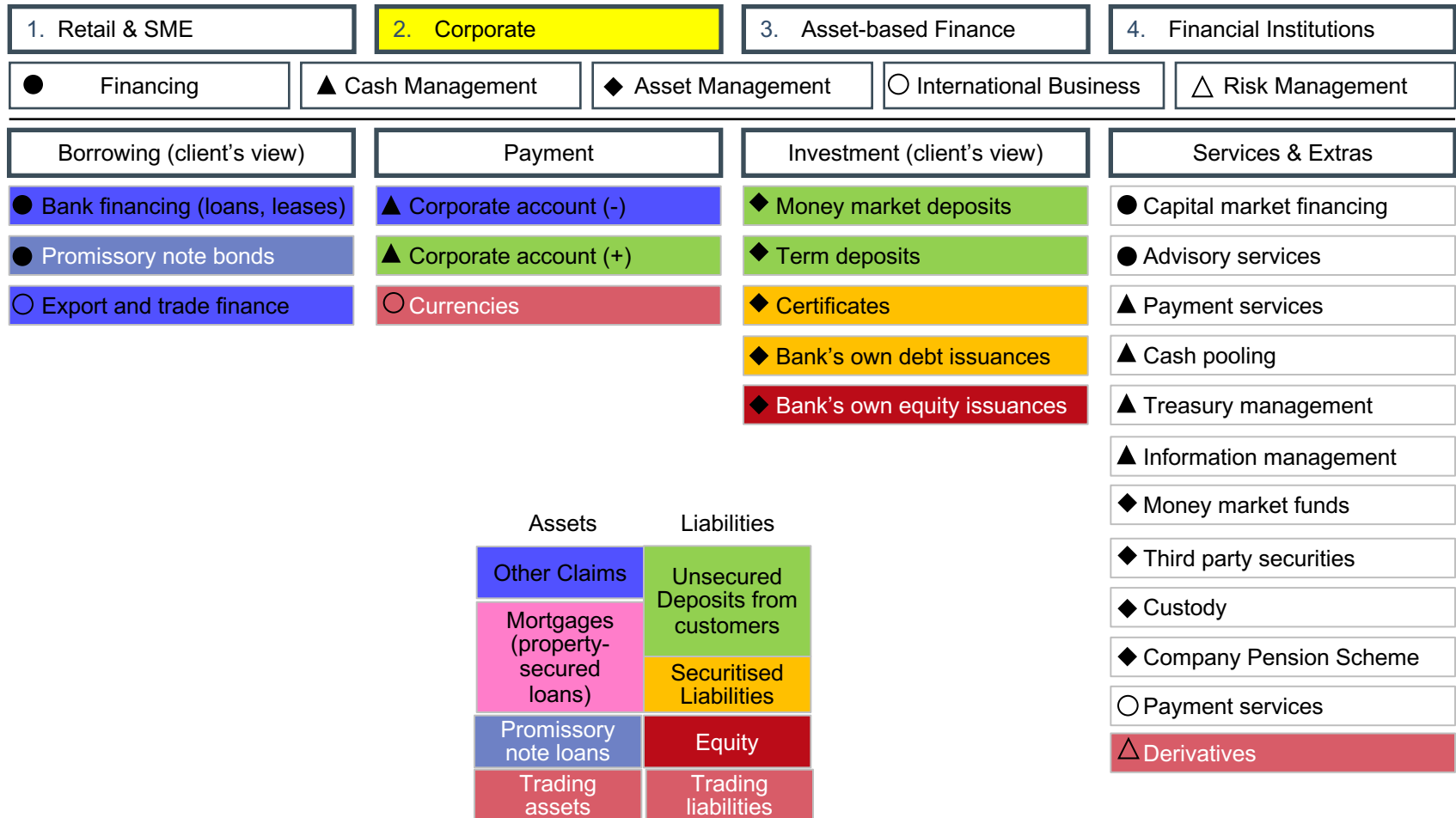
- |                 |              |                        |                           |
|-----------------|--------------|------------------------|---------------------------|
| 1. Retail & SME | 2. Corporate | 3. Asset-based Finance | 4. Financial Institutions |
|-----------------|--------------|------------------------|---------------------------|

Borrowing (client's view)	Payment	Investment (client's view)	Services & Extras
Loans\Overdraft Facility	Current account (-)	Saving Deposits	Government Securities
Loans\Consumption	Current account (+)	Term Deposits	Investment funds
Loans\Car		Certificates of deposits (CDs)	Investment funds Saving Plan
Loans\CreditCard			Wealth Management
Mortgages\Fixed-rate			Custody
Mortgages\Variable-rate			
Mortgages\Pre-payment Option			
Mortgages\Rate Locker			
Mortgages\Securitisation Blocker			

Assets	Liabilities
Other Claims	Unsecured Deposits from customers
Mortgages (property-secured loans)	Securitized Liabilities



# From products to balance sheet



# From products to balance sheet

1. Retail & SME      2. Corporate      **3. Asset-based Finance**      4. Financial Institutions

● Asset Mgt & Leasing      ▲ Real Estate Finance      ◆ Ship Finance      ○ Public Finance

Borrowing (client's view)      Payment      Investment (client's view)      Services & Extras

- Finance leases (real estate)
- Operating leases
- ▲ Real estate loans
- ◆ Ship loans
- Unsecured loans
- RE/ infrastructure loans
- Repo (spot purchase)

- ▲ Pfandbrief
- ◆ Ship Pfandbrief
- Public sector Pfandbrief
- Repo (spot sale)

- Investment funds

Assets	Liabilities
Other Claims	Unsecured Deposits from customers
Mortgages (property-secured loans)	Securitised Liabilities
Promissory note loans	Equity
Trading assets	Trading liabilities
Other assets	Secured deposits from customers

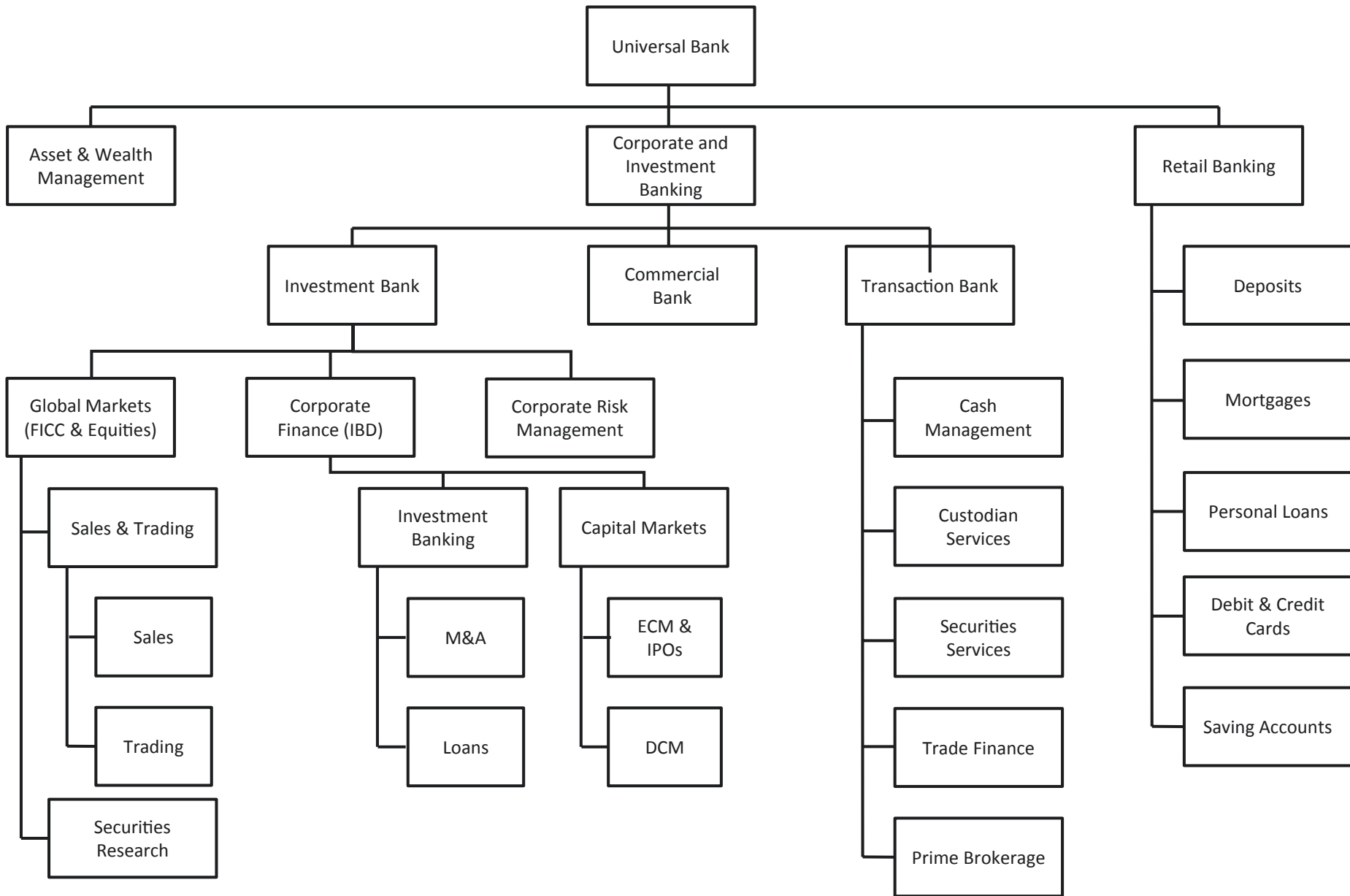
# From products to balance sheet

1. Retail & SME	2. Corporate	3. Asset-based Finance	4. Financial Institutions ●
-----------------	--------------	------------------------	-----------------------------

Money market trading ▲	Liquidity management ◆
------------------------	------------------------

Borrowing (client's view)	Payment	Investment (client's view)	Services & Extras
Trade loans ●	Correspondent banks (-) ●	Repo (spot sale) ● ▲	Advisory services ●
Repo (spot purchase) ● ▲	Correspondent banks (+) ●	UD from other banks ▲	Payment services ●
Deposits to other banks ▲	Currencies ●	Funding liquidity reserve ◆	Cash pooling ●
Liquidity reserve ◆			

Assets	Liabilities
Other Claims	Unsecured Deposits from customers
Mortgages (property-secured loans)	Securitised Liabilities
Promissory note loans	Equity
Trading assets	Trading liabilities
Other assets	Secured deposits from customers
Claims on banks	UD from banks
Cash reserve	SD from banks



# Wholesale banking

- Large value, low volume part of banking business
- Mix of domestic and foreign currency business
- Large size of deposits and loans
- Tailor made loans
- Dependence on inter-bank market
- Greater importance of off-balance-sheet facilities
- Small proportion of demand deposits

# Universal banking

- Keeps customers in one stop shop
- Economies of scale exhausted quickly and constant returns to scale
- Economies of scope
- Size allows for risks to be spread and internally diversified
- Size also creates danger of **Too Big to Fail**

# Islamic banking

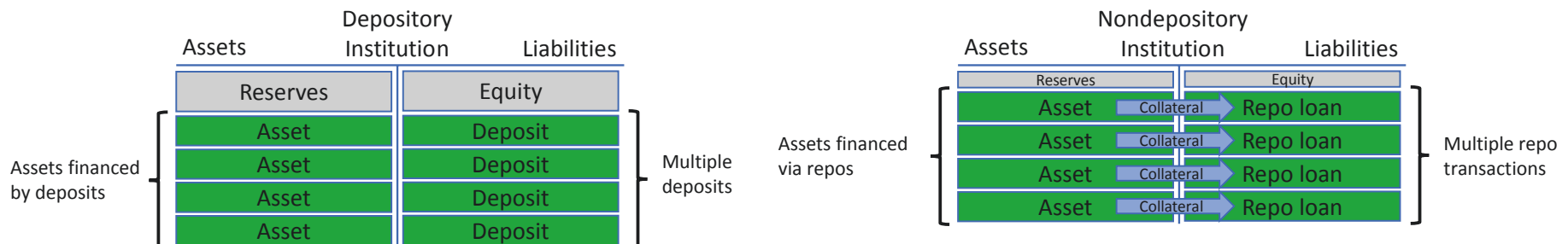
- *Risk sharing* – each participant must share in the same risk-return distribution (removes asymmetric information problem)
- *Materiality* – all financial transactions must be backed by a tangible asset (no options).
- *Non-exploitation* – neither party can be exploited
- *No sinful activity* – alcohol, gambling, etc
  
- Widely practiced model is 2-tier Mudaraba
  - Depositors enter into a contract with the bank to share profit
  - Bank enters into a contract with the borrower to split the profit
  
- Fast rate of growth
- Islamic banking assets only constitute up to 2% of global banking assets

# Shadow banking

- *Financial Stability Board* definition – ‘credit intermediation involving entities and activities outside the regular banking system’
- Hedge Funds – more aggressive investment strategies than life assurance & pension funds.
- Special Purpose Vehicles – vehicle for securitisation
- Money Market Funds – short term high quality securities
- Private Equity – investment in private companies

Process takes between 3 and 7 steps:

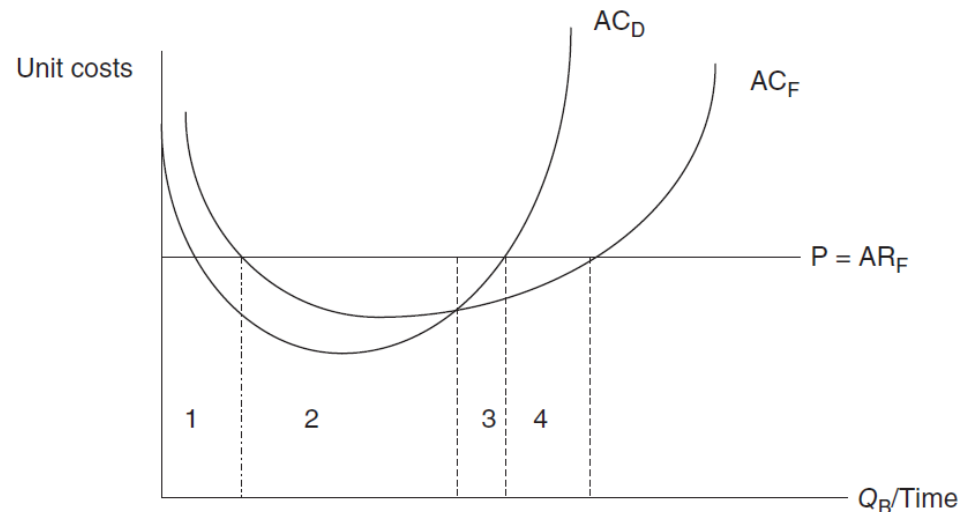
1. Loan originated by Bank or other FI
2. Loan warehousing financed by ABCP
3. Pooling & structuring loans by broker/dealers
4. ABS warehousing via trading book financed by REPOs
5. Pooling & structuring of ABS into CDOs done by broker dealers.
6. ABS intermediation is carried out by SIVs & hedge funds
7. All steps funded in the wholesale market





# International banking

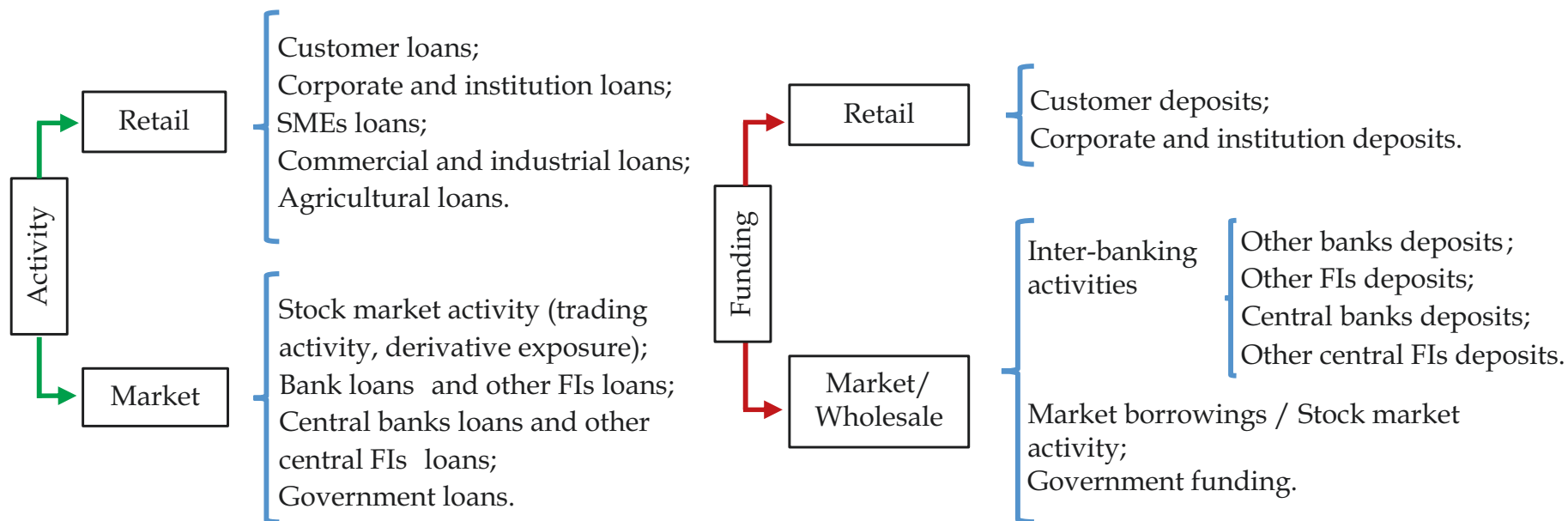
- Decision to locate depends on a number of factors
- Home Country Characteristics
  - Home country regulations
  - Resource costs
- Host Country Characteristics
  - Absence or lack of regulation
  - Monopolistic characteristics
  - Information exploitation



- Phase 1 – home production, export bank services abroad  $AC_F > AR_F > AC_D$
- Phase 2 – bank in home country establishes foreign facilities  $AR_F > AC_F > AC_D$
- Phase 3 – foreign production is cheaper than at home (greater foreign share of business)  $AR_F > AC_D > AC_F$
- Phase 4 – home country bank produces bank services abroad and import to domestic country  $AC_D > AR_F > AC_F$

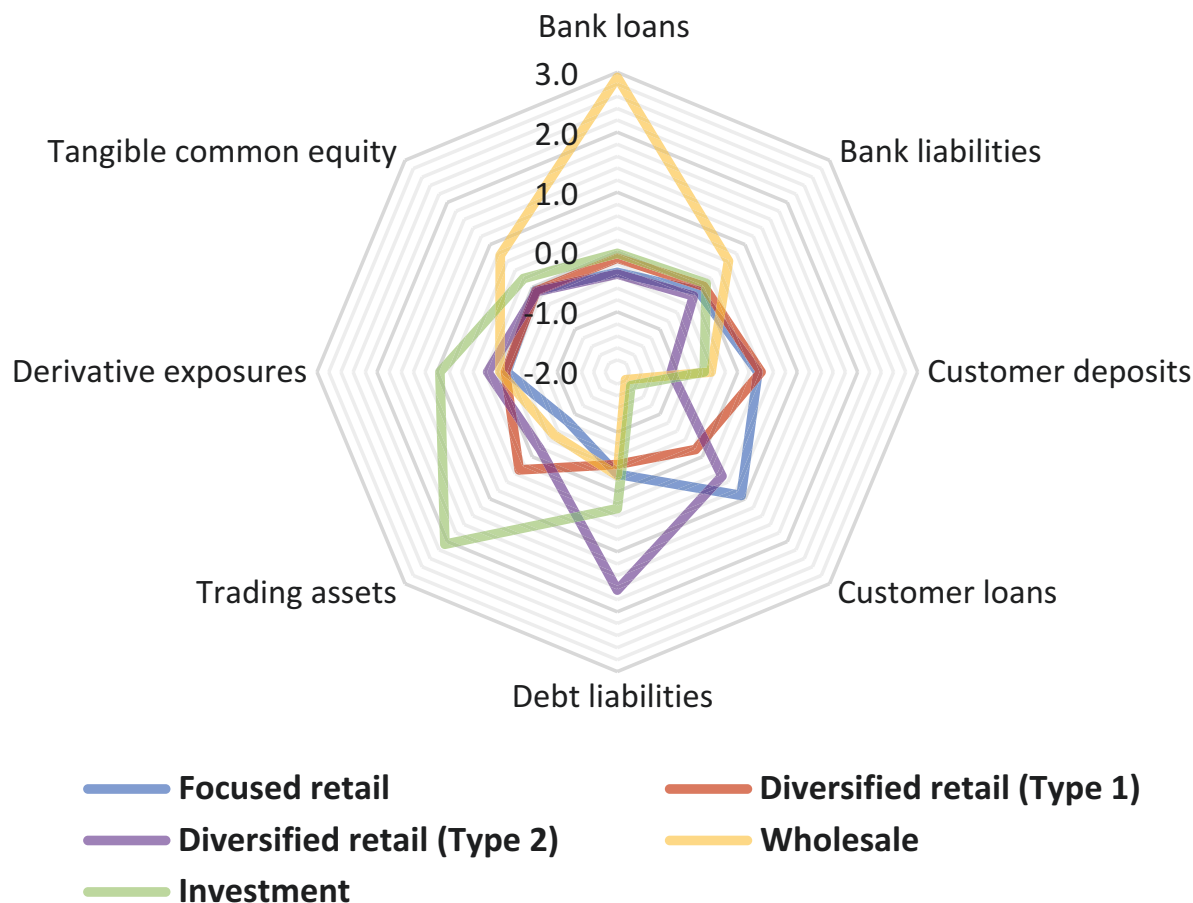


# Bank Business Models



# Bank Business Models

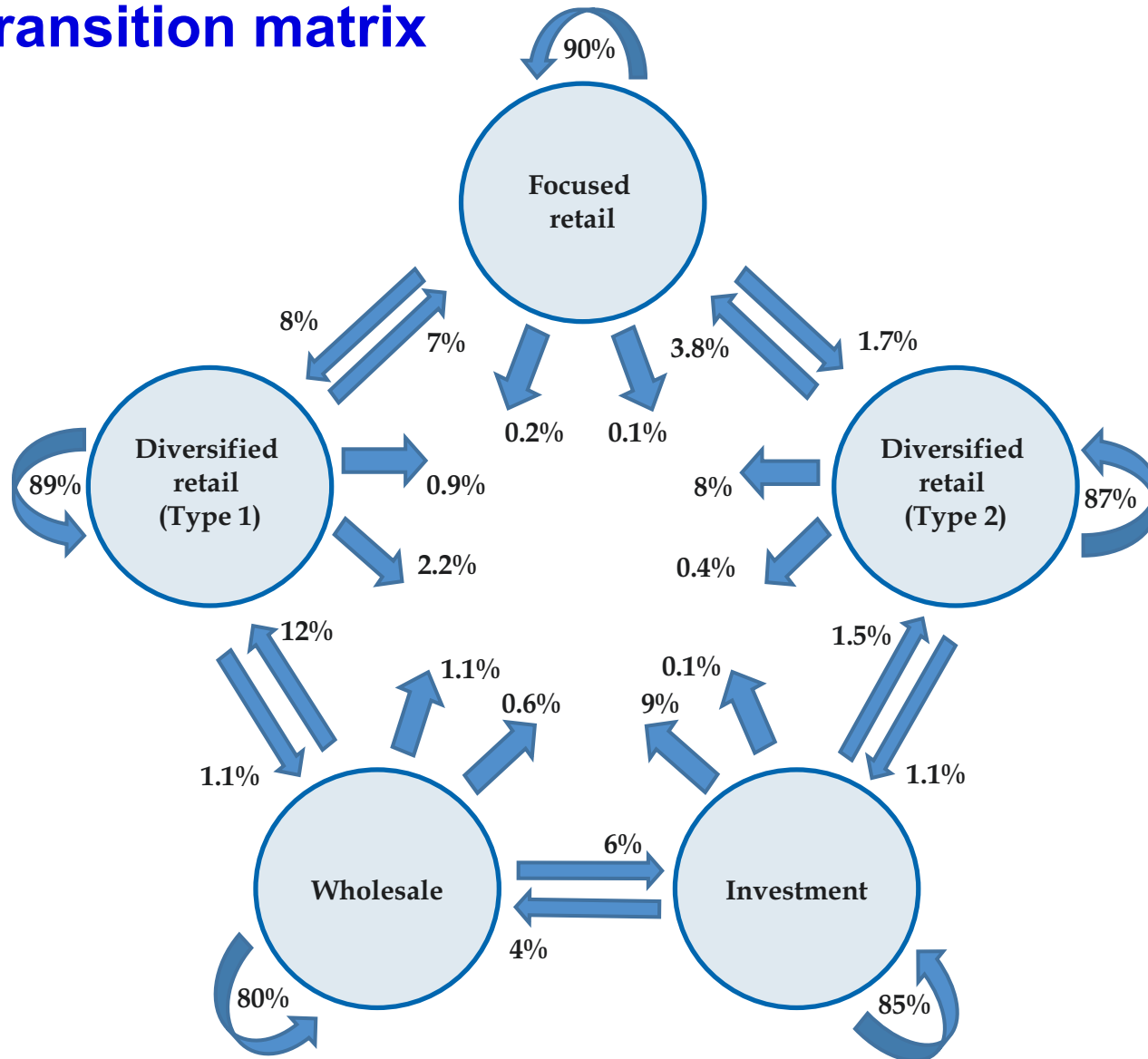
## Cluster analysis for European banks



Ayadi and de Groen (2016) define BBMs distinguishes primarily between the key banking activities and the funding strategy, which broadly builds on asset-liability approach. Analysis covers 147 banking groups in Europe (80% of EU bank assets) in years 2006-2013. Financial crisis affected BBMs – banks received state aid have reoriented towards focused retail.

# Bank Business Models

## Model transition matrix

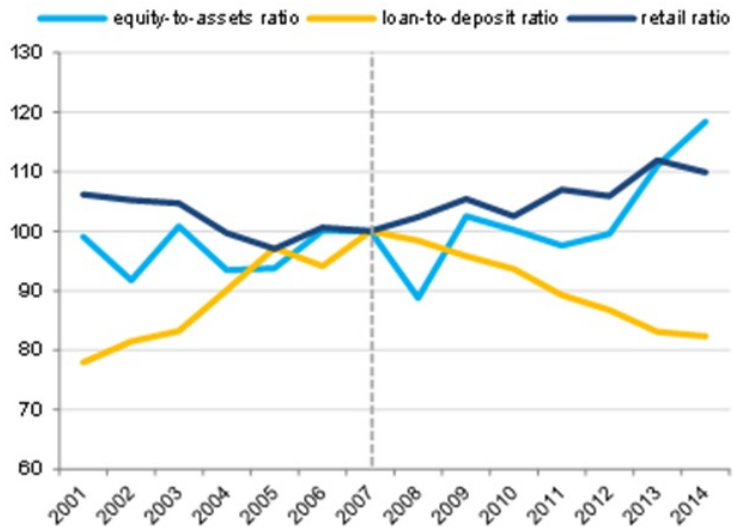


# EU bank' adjustment to new business models

Shift in EU banks' business models since the crisis to lower leverage, reduced reliance on wholesale funding and higher reliance on retail activities¶¶

Changes in EU significant banking groups' key business model characteristics after the crisis¶¶

(2001-2014; index 2007=100)¶¶



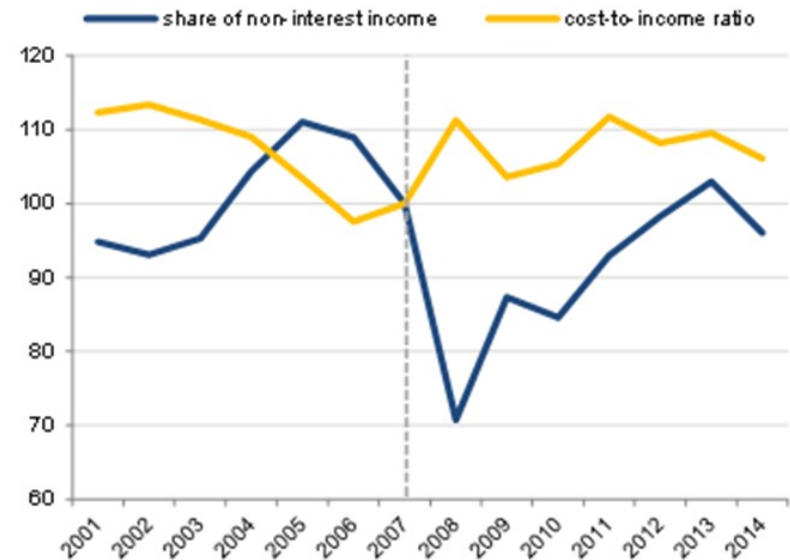
Sources: Bloomberg, SNL and ECB calculations.¶¶

Notes: The index is based on the median value for each indicator. The retail ratio is calculated as the ratio of customer deposits plus (net) customer loans over total assets.¶¶

Income diversification gradually increased compared with crisis lows, while cost efficiency did not show any improvement in the post-crisis period¶¶

Changes in EU significant banking groups' non-interest income share and cost-to-income ratio after the crisis ¶¶

(2001-2014; index 2007=100)¶¶

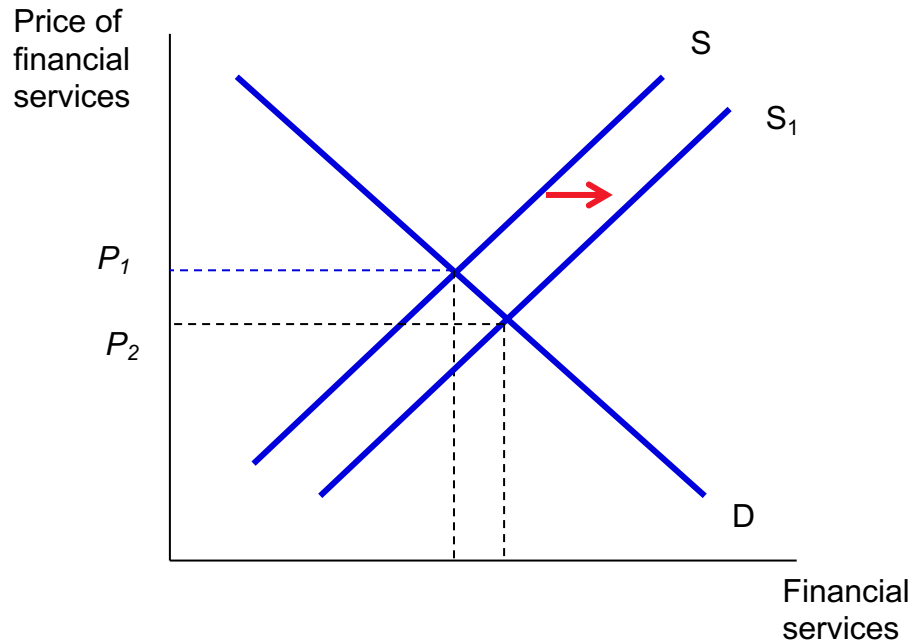


Sources: Bloomberg, SNL and ECB calculations.¶¶

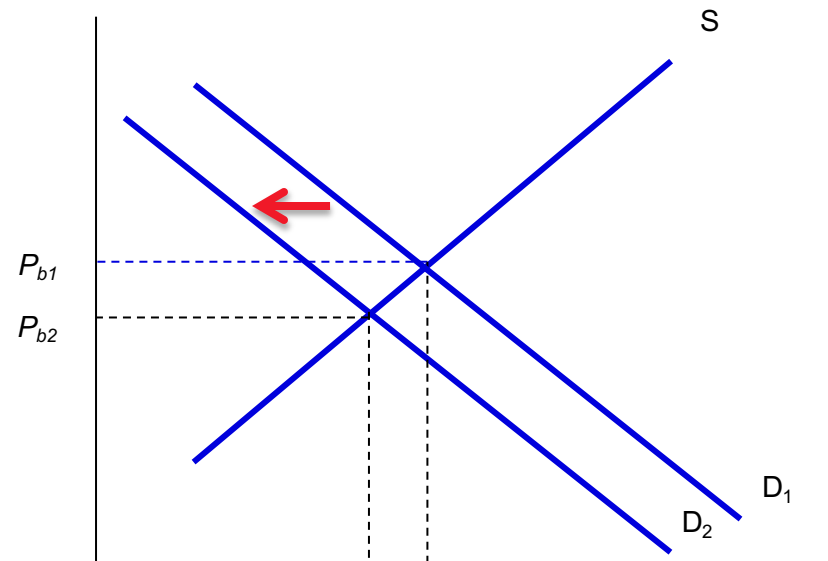
Note: The index is based on the median value for each indicator. ¶¶

# Competition

Competition from NBFIs increases supply of financial services



Increased substitution leads to fall in demand for bank services



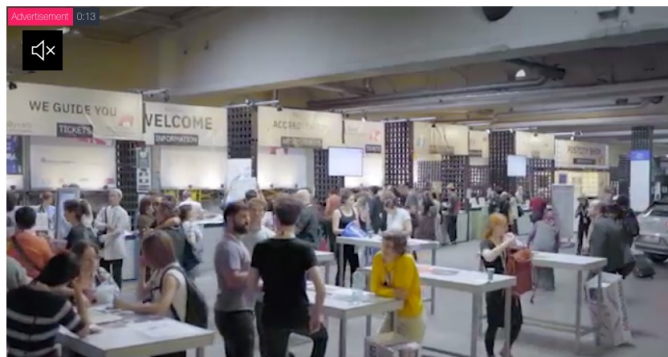


Business

# Nordea Bank's 6,000 Job Cuts Are Just the Beginning, Union Says

By Hanna Hoikkala and Frances Schwartzkopf

December 1, 2017, 7:45 AM GMT+1 Updated on December 1, 2017, 10:48 AM GMT+1



## ING announces 7,000 job cuts as unions condemn 'horror show'

Dutch bank's decision to shed 12% of staff in favour of digital investment prompts threat of strike action from workers



▲ Disgruntled workers outside ING Belgium's head office in Brussels. Photograph: Stephanie Lecocq/EPA

ING's plans to shed 7,000 jobs and invest in its digital platforms to make annual savings of €900m by 2021 has drawn swift criticism of the Netherlands' largest financial services company from unions.

# NEWS

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## Deutsche Bank could cut up to 20,000 jobs

7 July 2019

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Up to 20,000 jobs could be axed at Deutsche Bank in a radical reorganisation of Germany's biggest bank.



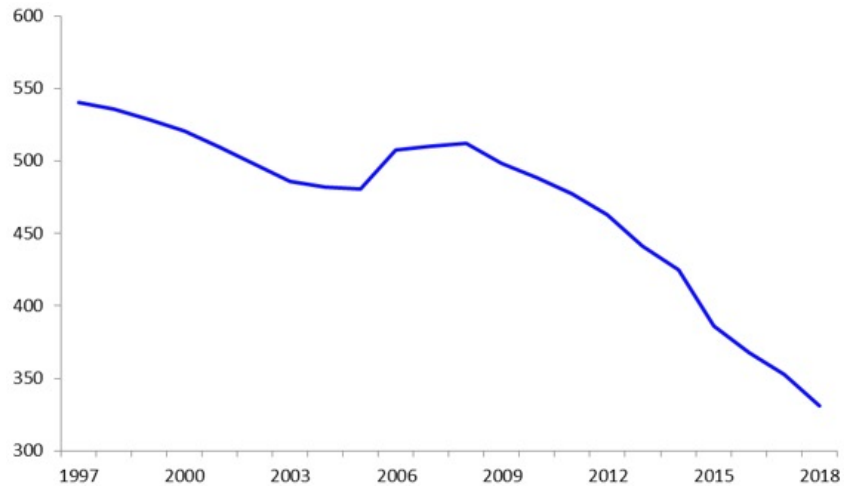
# Pokračuje propouštění v bankách. Komerčka se zbaví čtvrtiny zaměstnanců



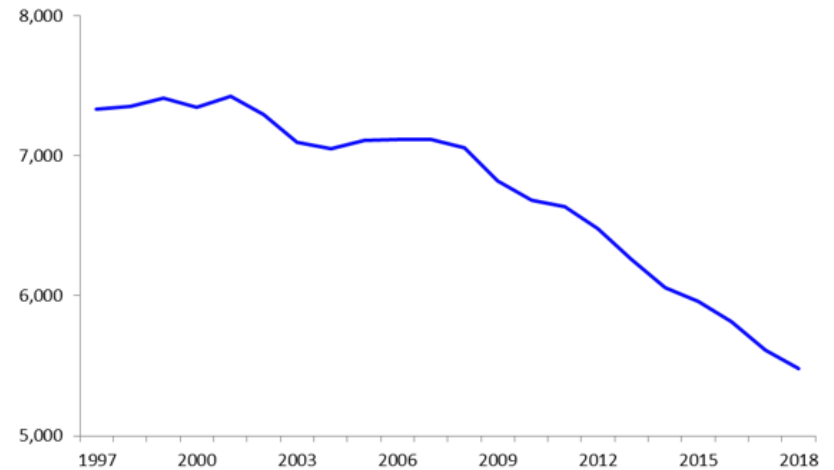
JIŘÍ ZATLOUKAL



## Bank branches per million inhabitants (EU15)



## Bank employees per million inhabitants (EU15)



Source: ECB Statistical Data Warehouse

Core business area	IT systems used
Lending	IS from external vendors (i.e., SAP “Commercial Banking Operations” Module)
Taking/managing deposits	Branch and ATM network In-house-developed IS (online and mobile banking) SAP software modules
Payments processing and infrastructure	ATM networks In-house-developed IS (online and mobile banking) Card and digital payment networks SEPA
Compliance with regulations	Manual labour RegTech systems
Marketing and sales	CRM technology Salesforce automation technology

# AI in Banking

- More accurate default predictions can be made with previously unused data types
- A greater variety of algorithms in credit risk estimation
- Safer payment networks (detection of fraud and money laundering)
- Managing the scale of the business infrastructure (predicting the amount of cash withdrawals, payments, etc.)
- Detection of non-compliance with regulations (analysis of phone conversations between employees and clients and between employees in real-time, natural language processing to read and interpret regulatory documents)
- Prediction of financial product purchases
- Churn prediction

# Literature

- Choudhry M. (2022). The Principles of Banking, 2nd ed. – Chapter 1
- Matthews and Thompson (2015). The Economics of Banking. – Chapters 1, 3-5.
- Ayadi, R. (2019). Bank business models. – Chapters 3-4, 7.