HSBC Quants Academy

Introduction to banking/financial services organizations

February 2024

HSBC

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Background of banking

*"Banks are to the economy what the heart is to the human body.
They cycle necessary capital through the whole, and
they are barely noticed until pressure, necessity, or crises."*

Hendrith Smith, Essays on the Banking Industry

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Why were banks needed?

Infrastructure/lifestyle changes:

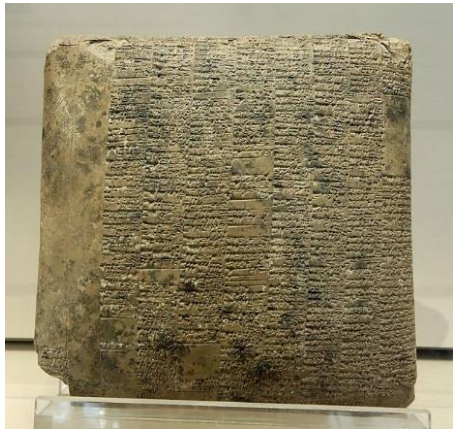
- Hunting/gathering food -> agricultural practice
- Bartering evolved as a way of exchanging goods
- Invention of money. Early money took forms such as sea shells
- Invention of record-keeping
- People began to build and live in the civilization of cities

Invention of money -> new needs:

- Borrowing
- Keeping them in safety
- Change of money (⇔currency exchange)
- Money transfers

- The history of banking is intertwined with the history of money
- Financial intermediaries (i.e. banks) bring the savers and the borrowers together

Picture: ancient "balance sheet", clay, ca. 2040 BC.



Initially religious restrictions on interest existed in some cases:

- For example, the charging of interest was banned by Christian churches. The rise of Protestantism in the 16th century weakened Rome's influence, and its dictates against usury became irrelevant in some areas. That freed up the development of banking in Northern Europe.
- Despite the prohibition of charging interest, during the 20th century a number of developments took place that would lead to an Islamic banking model where no interest is charged but banks would still operate for profit. This would be done through charging for loans in different ways such as through fees and using method of risk sharing and different ownership models such as leasing.

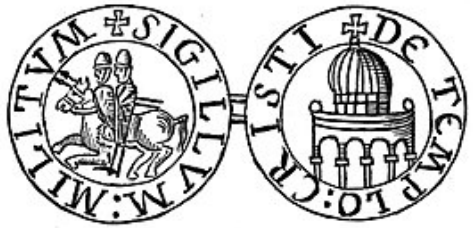
History and evolution of banking: before the emergence of modern banking

Earliest banking

- First quasi-banking activities are thought to have begun within the 4th to 3rd millennia BCE.
- For example, in Babylonia of 2000 BCE, people depositing gold were required to pay amounts as much as one sixtieth of the total deposited. Both the palaces and temple are known to have provided lending and issuing from the wealth they held. Such loans typically involved issuing seed-grain, with re-payment from the harvest.
- In ancient China, Chinese currency developed with the introduction of standardized coins that allowed easier trade across China, and led to development of letters of credit. These letters were issued by merchants who acted in ways that today we would understand as banks.
- Ancient Rome had a Europe-wide banking system for money transfer

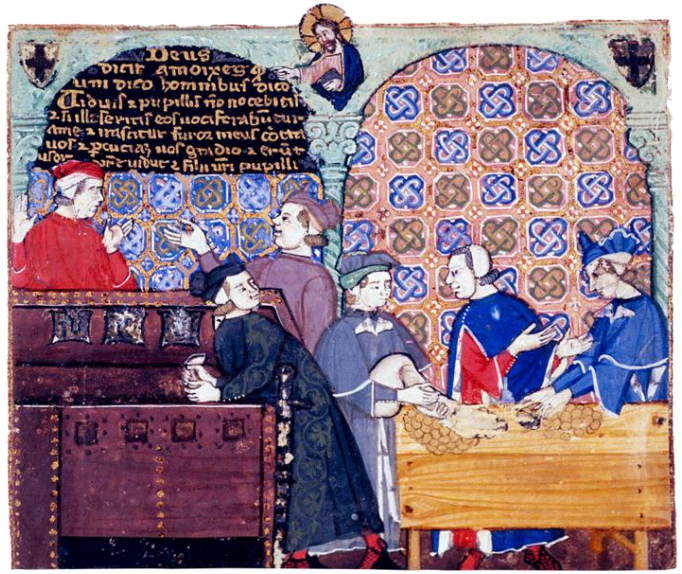
Medieval Europe

- Emergence of merchant banks performing both financing and underwriting functions;
- Crusades created the need to transfer large sums of money (leading to development of a demand note);
- Discounting of interest was developed;
- First foreign exchange contracts occurred;
- The world oldest currently operating bank was established in Italy (Banca Monte dei Paschi di Siena, 1472).
- The Poor Fellow-Soldiers of
- Christ and of the Temple of Solomon (ca. 1119 – Friday, 13 October 1307 -- 22/03/1312) set up again an international banking system



15th –17th centuries – expansion

- In the times between 1527 and 1572 a number of banking family groups emerged (for example, the Grimaldi, Spinola and Pallavicino families).
- In the City of London there were not any banking houses operating in a manner recognized as so today until the 17th century, although the London Royal Exchange was established in 1565.



History and evolution of banking: moving to modern banking

17-19th centuries – the emergence of modern banking

- By the end of the 16th century and during the 17th, the traditional banking functions of accepting deposits, moneylending, money changing, and transferring funds were combined with the issuance of bank debt that served as a substitute for gold and silver coins.
- By the end of the 17th century, banking was also becoming important for the funding requirements of the combative European states. This would lead on to government regulations and the first central banks. The success of the new banking techniques and practices in Amsterdam and London helped spread the concepts and ideas elsewhere in Europe.
- Famous sizable international bank: Rotschild. Fudning both Napoleon and George II

20th century was characterized by:

- Multiple bank crises, for example:
  - The Panic of 1907 in the US (which led to numerous runs on banks).
  - Great Depression (over 9000 banks failed during the 1930s).
- Creation of the World Bank (WB) and the International Monetary Fund (IMF) (encouraged by these institutions, commercial banks started to lend to sovereign states in the third world).
- Increasing use of new technologies:
  - First ATMs (1960s).
  - Electronic data processing;
  - SWIFT payment network (1973).
- Globalization/internationalization of banking and financial markets.

21st century

- The early 2000s were marked by consolidation of existing banks and entrance into the market of other financial intermediaries (non banking financial institutions, NBFIs).
- The process of financial innovation advanced enormously, leading to a major shift away from traditional banking to internet banking.
- Different financial instruments are being explored and adopted by both the banking and non-banking industries, the distinction between different financial institutions is gradually vanishing.
- The financial crisis of 2007–2008 caused significant stress on banks around the world. These events spawned the term '*too big to fail*' and shifted regulatory focus from only supervising separate banks to also overviewing systemic risk.

Current state of financial industry

"Banking is very good business if you don't do anything dumb. The banking business is no favorite of ours. When assets are twenty times equity - a common ratio in this industry - mistakes that involve only a small portion of assets can destroy a major portion of equity. And mistakes have been the rule rather than the exception at many major banks"

Warren Buffett

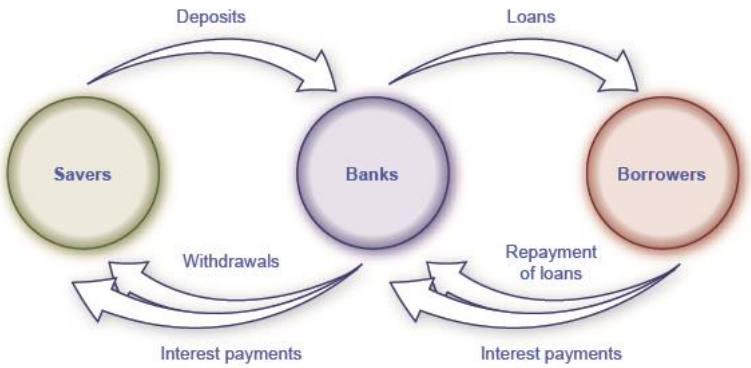
"In financial services, if you want to be the best in the industry, you first have to be the best in risk management and credit quality. It's the foundation for every other measure of success. There's almost no room for error."

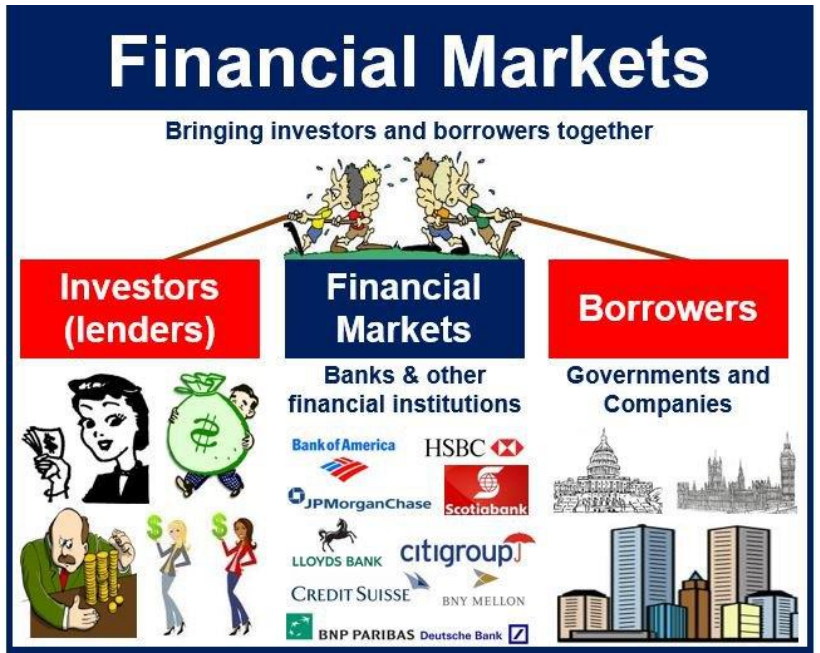
John Stumpf

HSBC

Financial market participants

- Banks are the main financial intermediaries (carrying out a huge range of transactions occurring in goods, labor and financial capital markets);
- Bringing together surplus agents (savers) and deficit agents (borrowers) lowers overall transaction costs;
- Banking business is highly leveraged -> intermediation should be done in the most risk free manner (so that savers' money can be returned when due, even in case of a borrower insolvency);
- Banks also act as maturity transformators (by converting short-term liabilities (i.e. deposits) into long-term assets (i.e. loans)).





- Other market participants can be:
  - Insurance companies (underwriting the risk of loss/damage to personal and business assets, and receiving premium in return);
  - Pension funds (paying for employee retirement, conservative investment strategy to preserve the principal);
  - Mutual funds (pooling money from multiple investors and investing in equities/bonds or both);
  - Hedge funds (pooling money from qualified investors, investing in any strategies that can generate profit, often use leverage, riskier);
  - Payment systems (settling financial transactions, e.g. SWIFT);
  - Other…

Overview of banking business models

Bank's business models have changed over time from engaging mostly in traditional commercial banking activities to becoming active in less traditional activities, such as investment banking.

Common banking business models:

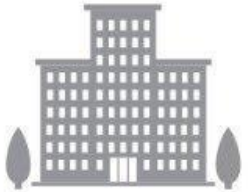
- Commercial banks;
- Investment banks;
- Retail banks;
- Private banks;
- Universal banks.

1

Local boutiques

Small and mid-sized domestic banks serving retail and business customers with their home country, state or province; also represents banks that have a core focus on a particular product or service, such as credit cards, mortgages, niche investment or wealth management

2



Regional champions

Built on local expertise and a targeted customer base; represents banks that operate major business lines across multiple countries or provide a full-service offering in their home markets

3

Global boutiques

Provide selected services and products to global clients (e.g., leading M&A advisory internationally)

4

Universal super banks

Truly international in coverage and depth; provide a full range of services to a global customer base

HSBC Group Fianncial Statements

Download:

Annual Report | HSBC Holdings plc

Consolidated balance sheet
at 31 December 2023

	Notes*	At[1] 31 Dec 2023 $m	31 Dec 2022 $m	1 Jan 2022 $m
Assets				
Cash and balances at central banks		**285,868**	327,002	403,018
Items in the course of collection from other banks		**6,342**	7,297	4,136
Hong Kong Government certificates of indebtedness		**42,024**	43,787	42,578
Trading assets	11	**289,159**	218,093	248,842
Financial assets designated and otherwise mandatorily measured at fair value through profit or loss	14	**110,643**	100,101	110,795
Derivatives	15	**229,714**	284,159	196,882
Loans and advances to banks		**112,902**	104,475	82,567
Loans and advances to customers		**938,535**	923,561	1,044,534
Reverse repurchase agreements – non-trading		**252,217**	253,754	241,648
Financial investments	16	**442,763**	364,726	392,005
Assets held for sale	23	**114,134**	115,919	3,411
Prepayments, accrued income and other assets	22	**165,255**	156,149	136,196
Current tax assets		**1,536**	1,230	970
Interests in associates and joint ventures	18	**27,344**	29,254	29,609
Goodwill and intangible assets	21	**12,487**	11,419	11,169
Deferred tax assets	7	**7,754**	8,360	5,432
Total assets		**3,038,677**	2,949,286	2,953,792
Liabilities				
Hong Kong currency notes in circulation		**42,024**	43,787	42,578
Deposits by banks		**73,163**	66,722	101,152
Customer accounts		**1,611,647**	1,570,303	1,710,574
Repurchase agreements – non-trading		**172,100**	127,747	126,670
Items in the course of transmission to other banks		**7,295**	7,864	5,214
Trading liabilities	24	**73,150**	72,353	84,904
Financial liabilities designated at fair value	25	**141,426**	127,321	145,503
Derivatives	15	**234,772**	285,762	191,064
Debt securities in issue	26	**93,917**	78,149	78,557
Liabilities of disposal groups held for sale	23	**108,406**	114,597	9,005
Accruals, deferred income and other liabilities	27	**136,606**	134,313	115,900
Current tax liabilities		**2,777**	1,135	699
Insurance contract liabilities	4	**120,851**	108,816	119,307
Provisions	28	**1,741**	1,958	2,566
Deferred tax liabilities	7	**1,238**	972	3,294
Subordinated liabilities	29	**24,954**	22,290	20,487
Total liabilities		**2,846,067**	2,764,089	2,757,474
Equity				
Called up share capital	33	**9,631**	10,147	10,316
Share premium account	33	**14,738**	14,664	14,602
Other equity instruments		**17,719**	19,746	22,414
Other reserves		**(8,907)**	(9,133)	6,447
Retained earnings		**152,148**	142,409	135,236
Total shareholders' equity		**185,329**	177,833	189,015
Non-controlling interests	19	**7,281**	7,364	7,303
Total equity		**192,610**	185,197	196,318
Total liabilities and equity		**3,038,677**	2,949,286	2,953,792

- Ca. 286 Trillion USD Balance sheet = $ 286,000 Billion = $ 286,000, 000, 000, 000

Compare (GDP are 2022 numbers):

- GDP of Poland 688 Bln USD
- GDP of the USA $25,000 Bln
- Total value of all companies on the WSE: $ 273 Bln.
- Balance UBS: $ 1 Trln
- Balance Pekao SA: $ 70 Bln.
- Market cap HSBC: $142.89 Billion

Consolidated income statement
for the year ended 31 December 2023

	Notes*	2023 $m	2022[1] $m	2021 $m
Net interest income		**35,796**	30,377	26,489
– interest income[2,3]		**100,868**	52,826	36,188
– interest expense[4]		**(65,072)**	(22,449)	(9,699)
Net fee income	2	**11,845**	11,770	13,097
– fee income		**15,616**	15,124	16,788
– fee expense		**(3,771)**	(3,354)	(3,691)
Net income from financial instruments held for trading or managed on a fair value basis	3	**16,661**	10,278	7,744
Net income/(expense) from assets and liabilities of insurance businesses, including related derivatives, measured at fair value through profit or loss	3	**7,887**	(13,831)	4,053
Net insurance premium income		**—**	—	10,870
Insurance finance (expense)/income	4	**(7,809)**	13,799	—
Insurance service result		**1,078**	809	—
– insurance revenue		**2,259**	1,977	—
– insurance service expense		**(1,181)**	(1,168)	—
Gain on acquisition[5]		**1,591**	—	—
(Impairment)/reversal of impairment relating to the sale of our retail banking operations in France[6]		**150**	(2,316)	—
Other operating (expense)/income[7]		**(1,141)**	(266)	1,687
Total operating income		**66,058**	50,620	63,940
Net insurance claims and benefits paid and movement in liabilities to policyholders		**—**	—	(14,388)
Net operating income before change in expected credit losses and other credit impairment charges[8]		**66,058**	50,620	49,552
Change in expected credit losses and other credit impairment charges		**(3,447)**	(3,584)	928
Net operating income		**62,611**	47,036	50,480
Employee compensation and benefits	5	**(18,220)**	(18,003)	(18,742)
General and administrative expenses		**(10,383)**	(10,848)	(11,592)
Depreciation and impairment of property, plant and equipment and right-of-use assets[9]		**(1,640)**	(2,149)	(2,261)
Amortisation and impairment of intangible assets		**(1,827)**	(1,701)	(1,438)
Goodwill impairment		**—**	—	(587)
Total operating expenses		**(32,070)**	(32,701)	(34,620)
Operating profit		**30,541**	14,335	15,860
Share of profit in associates and joint ventures	18	**2,807**	2,723	3,046
Impairment of interest in associate	18	**(3,000)**	—	—
Profit before tax		**30,348**	17,058	18,906
Tax expense	7	**(5,789)**	(809)	(4,213)
Profit for the year		**24,559**	16,249	14,693
Attributable to:				
– ordinary shareholders of the parent company		**22,432**	14,346	12,607
– preference shareholders of the parent company		**—**	—	7
– other equity holders		**1,101**	1,213	1,303
– non-controlling interests		**1,026**	690	776
Profit for the year		**24,559**	16,249	14,693
		$	$	$
Basic earnings per ordinary share	9	**1.15**	0.72	0.62
Diluted earnings per ordinary share	9	**1.14**	0.72	0.62

- 100 Billion USD interest income
- 24.5 Billion USD profit
- The HSBC Group employs ca. 223,000 people (16/03/22) and covers 66 countries.

Commercial banking

- Services businesses, from small enterprises and mid-market companies to large multinationals, by providing them with the tools they need to function efficiently.
- Many of their products are similar to those offered to individuals by retail banks (eg. checking and savings accounts).
- Offers banking products and services specifically designed to meet the financial needs of corporations.

Examples of services include:

- Merchant services such as credit card processing, mobile payment solutions and electronic check services;
- Lending services such as commercial real estate lending and equipment financing;
- Global trade services such as foreign exchange, financing and global payments;
- Treasury management services such as fund collecting and fraud prevention;
- Retirement products and services for businesses and their employees;
- Insurance products designed for corporations and institutions;
- Specialized services for certain types of businesses such as auto dealer services and investment real estate lending.

HSBC Commercial Banking (CMB) business line:

- Global trade and Receivables Finance (GTRF) provides services and financing for buyers and suppliers throughout the trade cycle;
- Global Liquidity and Cash Management gives businesses greater control over their cash and collections;
- Global Banking provides clients with access to a wide range of capital financing, including debt and equity.
- Insurance and Investments offers business and financial protection, trade insurance, employee benefits, corporate wealth management and a variety of other commercial risk insurance products.

Investment banking

- Investment bank is a financial services company or corporate division that engages in **advisory-based financial transactions** on behalf of individuals, corporations and governments;
- In contrast to commercial/retail banks, purely investment banks do not take deposits. Their activities can include:
  - Raising financial capital by underwriting debt financing and the issuance of equity securities, as in an Initial Public Offering (IPO);
  - Advising and facilitating Mergers & Acquisitions (M&A);
  - Providing ancillary services such as market making, trading of derivatives and equity securities as well as FICC services (fixed income instruments, currencies and commodities).

- According to the Financial Times, in terms of total advisory fees for the whole of 2017, the top ten investment banks were:

Rank	Company	Fees ($m)
1.	J.P. Morgan & Co.	6,908.44
2.	Goldman Sachs	6,078.60
3.	Bank of America Merrill Lynch	5,546.37
4.	Morgan Stanley	5,173.63
5.	Citigroup	5,161.39
7.	Credit Suisse	3,531.46
6.	Barclays Investment Bank	3,515.57
8.	Deutsche Bank	2,915.72
9.	Wells Fargo Securities	2,264.24
10.	RBC Capital Markets	2,217.26

- After the financial crisis of 2007–08 and the subsequent passage of the Dodd-Frank Act of 2010, regulations have limited certain investment banking operations, notably with the Volcker Rule's restrictions on proprietary trading.

Retail banking

- Also known as '**consumer banking**', it provides financial services to individual customers. The most important functions are deposit and credit:
  - Deposit services include savings accounts, transactional accounts, term deposits, certificates of deposits;
  - Credit services include mortgages, auto loans, personal loans, debit cards, credit cards;
- Retail banks expand their services including investment services (e.g. wealth management and retirement planning) offered by financial advisors, through local branches and (recently) online banking and mobile applications.
- The largest banks have retail banking divisions. Other types of retail banks:
  - Credit unions (cooperative institutions, small and usually non-profit).
  - Savings and loans institutions (focus on mortgages).
  - Sharia banks (conform to the Islamic prohibition against interest rates: borrowers share their profits with the bank instead of paying interests).
- The amount of money earned by a retail bank is determined by the spread (net interest income, NII) between the interest paid on deposits and the interest earned on loans. The spread fluctuates across economic cycles.
  - Good ecoconomic times -> the spread widens (banks usually accept deposits with lower interest rates and lend with higher interest rate) -> more income.
  - Economic recession -> banks may need to incentivize consumer spending by lowering interest rates on loans and offering higher deposit interest rates -> compressing margins.
- In addition to NII, a bank can generate revenue by charging its customers fees for banking services.

Retail banking (cont)

- The process of collecting deposits and making loans is a powerful tool for economic expansion, since banks create credit that did not previously exist, increasing thus the supply of money in the economy. This is known as the 'money multiplier effect'.
- There is a limit to the amount of credit that can be created in this way, as banks are required to keep a certain minimum percentage of all deposit claims as liquid cash (reserve ratio). The money multiplier effect works as follows:
  - There is an initial increase in bank deposits;
  - The bank holds a fraction of this deposit in reserves and then lends out the rest;
  - This bank loan will be re-deposited in banks allowing a further increase in bank lending and a further increase in the money supply.
- The money multiplier is calculated as:

$$Money\ multiplier = \frac{1}{Reserve\ ratio}$$

- For example, let's suppose that the reserve ratio is 10%. Hence, if someone deposits 100PLN, the bank will keep 10PLN as reserves and lend out 90PLN. Since 90PLN has been lent out, other banks will have future deposits of 90PLN. Therefore, the lending process can start again. If this process is repeated for an infinite number of times, then:

The final increase in money supply = Money multiplier x Initial deposit = $\frac{1}{0.1}$ x 100PLN = 1000 PLN

banks	Deposit	Money lent out	Reserves	Total deposits
stage 1	100	90	10	**100**
stage 2	90	81	9	**190**
stage 3	81	72.9	8.1	**271**
stage 4	72.9	65.6	7.3	**343.9**
stage 5	65.6	59.0	6.6	**409.5**
stage 6	59.0	53.1	5.9	**468.6**
stage 7	53.1	47.8	5.3	**521.7**
stage 8	47.8	43.0	4.8	**569.5**
stage 9	43.0	38.7	4.3	**612.6**
stage 10	38.7	34.9	3.9	**651.3**
....				
Ending at 10	**651.3**	**586.2**	**65.1**	**651.3**

Private banking (PB)

- It provides services to **high-net-worth individuals** (HNWIs) with high levels of income and sizable assets (a value of at least six figures).
- On top of common services, it can include discretionary asset management, tax advisory services…
- The key attraction of the private banking is the relationship – the customers are served on a more personal basis than in the mass market of retail banking.
- Employees designated to aid each client work:
  - to provide individualized financing solutions;
  - to help clients plan and save for their retirement.
  - to structure plans for passing accumulated wealth on to family members or other beneficiaries.
- Although private banking and wealth management can overlap, the main difference is that the first does not always deal with investing (though it may offer guidance on investment options).
- Private banking can be:
  - Active (involves constant input and decision making from the HNWI);
  - Passive (allows the bank to manage the clients' assets without substantial direction, was more popular it the past before turmoil in the financial markets).
- Sources of revenue:
  - Fee is charged for the private banking services, which is a percentage earned on Assets Under Managament (AUM).
  - Mortgage and business loans taken out by rich clients have steeper interest charges.
  - Clients utilizing private banking services pay for the specialized treatment they receive.
  - The bank has a large pool of money, in the form of the clients' substantial checking account balances, which can be utilized.

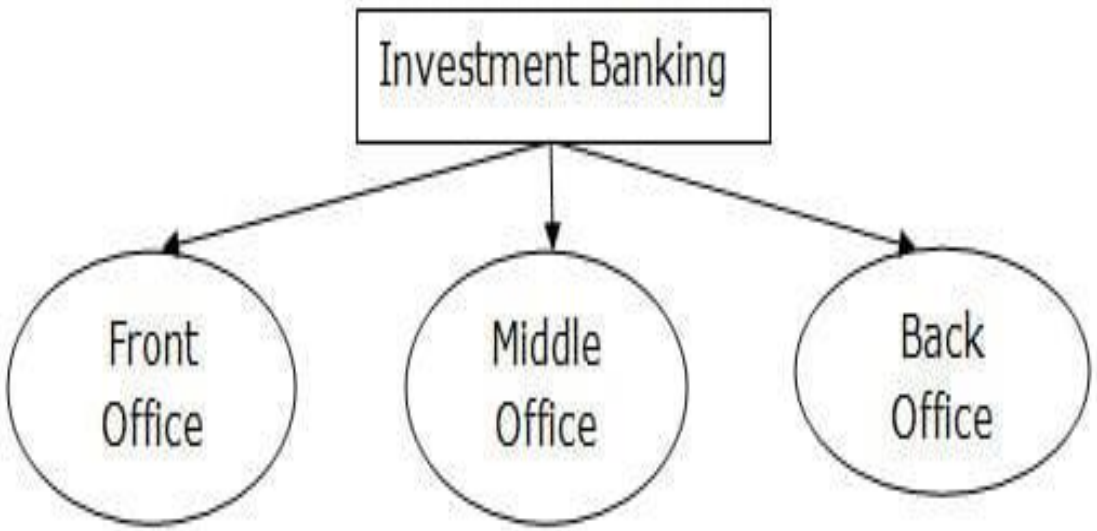
Universal banking

- Combines the services of a commercial bank and an investment bank, allowing these banks to offer a wide variety of financial options to their customers.
- It is also referred as a full-service financial institution.
- Types of services include deposit accounts such as checking and savings, loans and credit, asset and wealth management, buying and selling securities, financial and investment advice as well as insurance products.
- Universal banks can choose the activities that will participate and they can specialize in a subset of banking services.

- Advantages of universal banking include:
  - Diversification of risk (since such bank adopts a less risky strategy by dividing up its operations).
  - Benefit from the economies of scale in information technology and access to capital to serve companies and retail customers around the world.
- Examples of universal banks: HSBC, Deutsche Bank, ING Bank, UBS, Credit Suisse, Barclays, Bank of America, JPMorgan Chase and Wells Fargo.

Organizational structure of a bank (example of investment bank)

- A typical investment banking structure is available below.
- Each division plays an important role in making sure that the bank makes money, manages risk, and runs smoothly.



- Features of the roles among divisions:
  - Front office:
    - The most highly paid career paths.
    - High pressure – making decisions in short time frame that could make or lose huge amounts of money.
    - Long working hours.
  - Middle office:
    - Huge responsibility – make sure that the bank does not breach regulations and put its financial position and reputation at stake.
    - Challenging negotiations – need to convince front office not to get carried away with excessively risky investment.
  - Back office:
    - More standard office hours compared to the front office.
    - An international dynamic – operations teams are united across the globe to get tasks done and problems solved as quickly as possible.
    - Deadlines to meet – not so intense working environment as in the front office.

Front, middle and back office (investment bank)

Front office:

- Generates the bank's revenue.
- The most client-facing among divisions.
- Serves clients (individuals and corporates) and makes as much profit as possible for them.
- Consists of three primary sub-divisions: investment banking, sales & trading and research (though others can also exist).

Middle office:

- Supports the front office.
- Non-revenue producing division.
- Manages risk, calculates profits and losses and often is in charge of information technology.
- Consists of the following sub-divisions:
  - Risk management works closely with front office teams and helps the decision makers to mitigate investment risks.
  - Compliance ensures that the bank's practice is on the right side of legislation and industry standards.
  - Information technology works on the creation and maintenance of software and applications used by traders.

Back office:

- Business functions related to bank's operations;
- Supports front-office personnel to perform their client-facing duties.
- Includes jobs that do not directly generate revenues
- Plays an important role since helps organizations function smoothly
- Most back-office positions are located away from company's headquarters (i.e. outsource and/or offshore).
- Examples of back office divisions:
  - Finance/accounting
  - Human resources (HR)
  - Operations of compliance
  - Operations of IT

Banks stakeholders

- Stakeholders are individuals, legal entities or group of people who influence the bank and its activities and/or are influenced by the bank.
- Stakeholders can be internal or externa
- The bank works to effectively manage stakeholders.

- However, the self-interests of various stakeholders may not be aligned. This is known as "Conflict of Interest". It can occur due to:
  - The competition of legitimate influences (e.g. acting for multiple clients).
  - The presence of harmful influences (e.g. personal gain).
- Conflicts can arise between:
  - One client and another.
  - The bank and a client.
  - An employee and a client.
  - An employee and the bank.
  - One part of the bank and another.

Risk management, internal control and corporate governance

Risks are addressed through sophisticated risk management systems, internal control system and strong corporate governance.

Risk management systems include processes established to ensure that all material risks and associated risk concentrations are:

- Identified;
- Measured;
- Limited;
- Controlled;
- Mitigated;
- Reported on a timely and comprehensive basis.

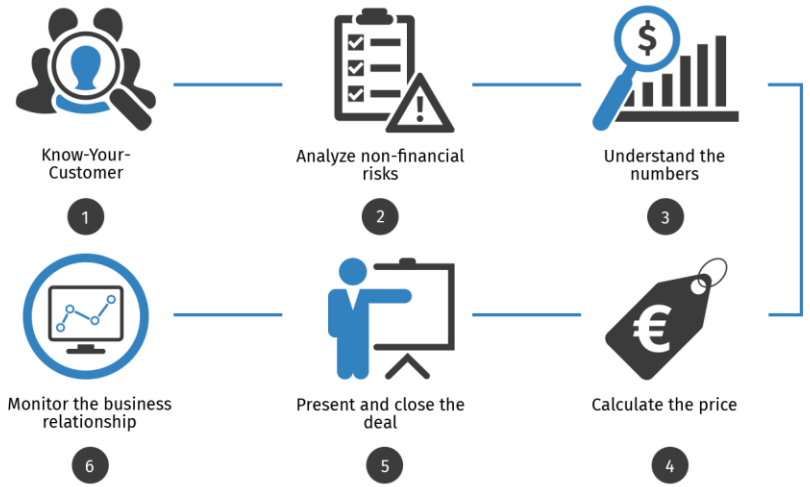
Internal control system is a set of rules and controls governing the bank's organizational and operational structure, including reporting processes, and functions for:

- Risk management;
- Compliance;
- Internal audit.

Corporate governance is a set of relationships between a company's management, its board, its shareholders and other stakeholders which provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance. It helps define the way authority and responsibility are allocated and how corporate decisions are made.

Credit risk

Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms.



Some ways to mitigate credit risk:

- Risk-based pricing;
- Covenants;
- Credit insurance and credit derivatives;
- Guarantee from a third party;
- Tightening (e.g. reducing exposure amount or payment terms);
- Diversification;
- Collateral.

Some important credit risk management terminology:

- Standardized approach (SA);
- Internal Risk Based approach (IRB);
- Expected Losses (EL);
- Probability of Default (PD);
- Loss Given Default (LGD);
- Exposure at Default (EAD).

Market risk

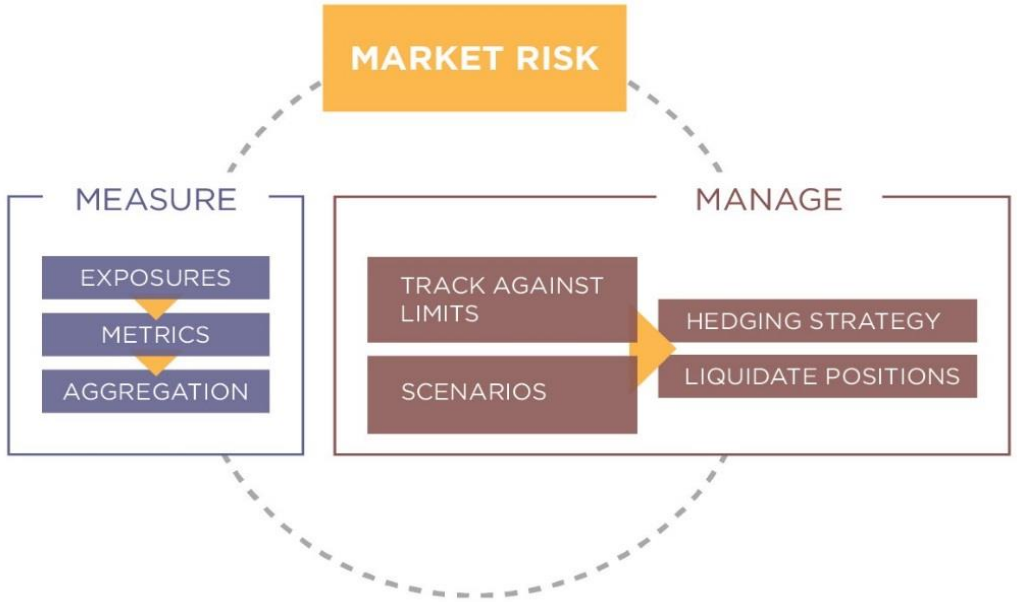
Market risk can be defined as the risk of losses arising from movements in market prices.

Examples of risks included in market risk:

- Interest rate risk (banking book);
- Interest rate risk (trading book);
- Equity risk;
- Foreign exchange (FX);
- Commodities risk.

Some important market risk management terminology:

- Standardized approach (SA);
- Internal models approach (IMA);
- Value at Risk (VaR);
- Expected Shortfall (ES);
- Monte-Carlo simulation;
- Counterparty Credit Risk (CCR);
- X-Value Adjustments (XVA).



Operational risk

Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic.

Types of operational risk events:

- Internal fraud;
- External fraud;
- Employment practices and workplace safety;
- Clients, products and business practices;
- Damage to physical assets;
- Business disruption and system failures;
- Execution, delivery and process management.

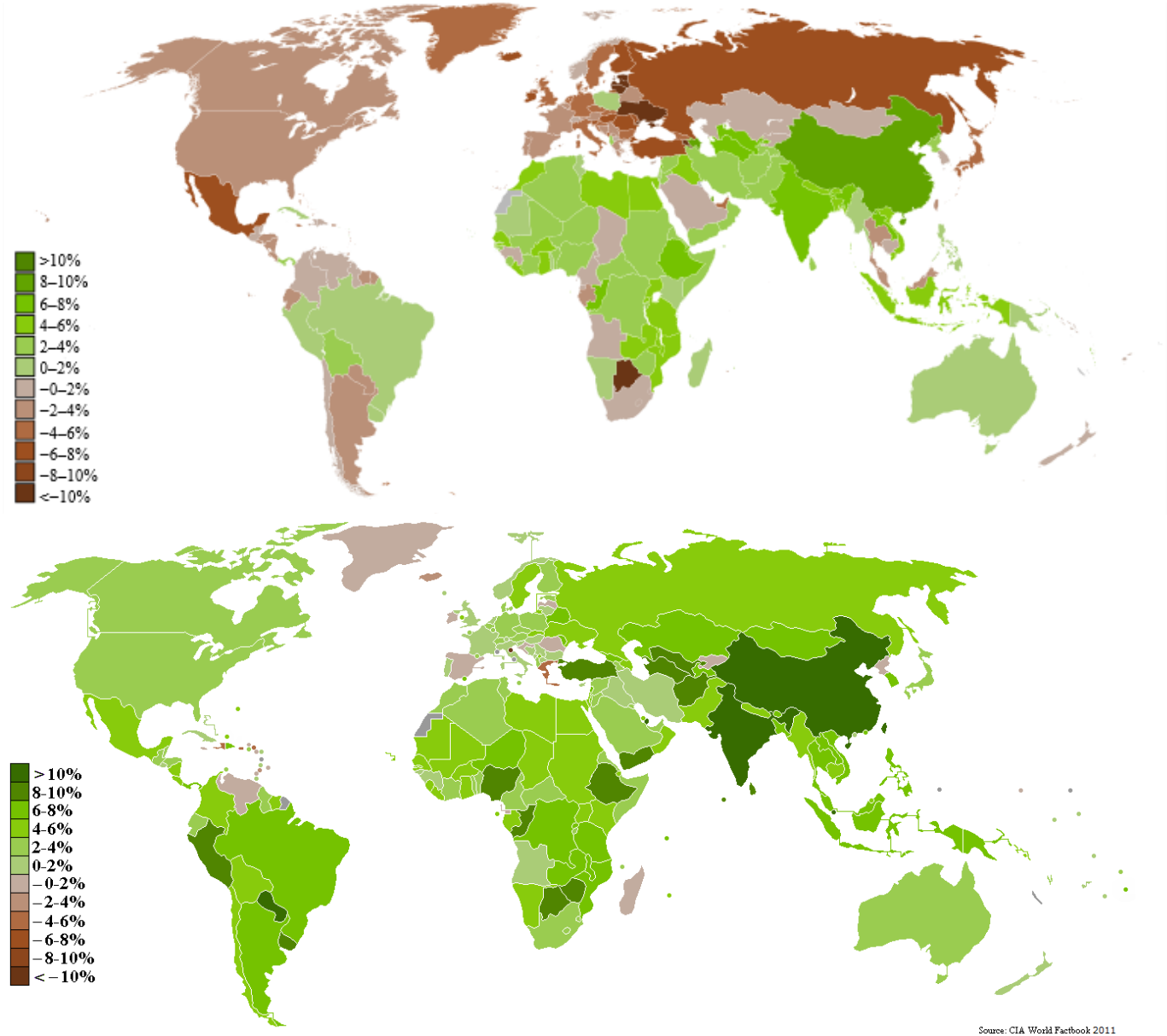
Some important operational risk management terminology:

- Basic indicator approach (BIA);
- Standardized approach (SA);
- Advanced measurement approaches (AMA);
- The Business Indicator (BI);
- The Internal Loss Multiplier (ILM);
- Scenarios Analysis;
- Loss Distribution Approach (LDA).

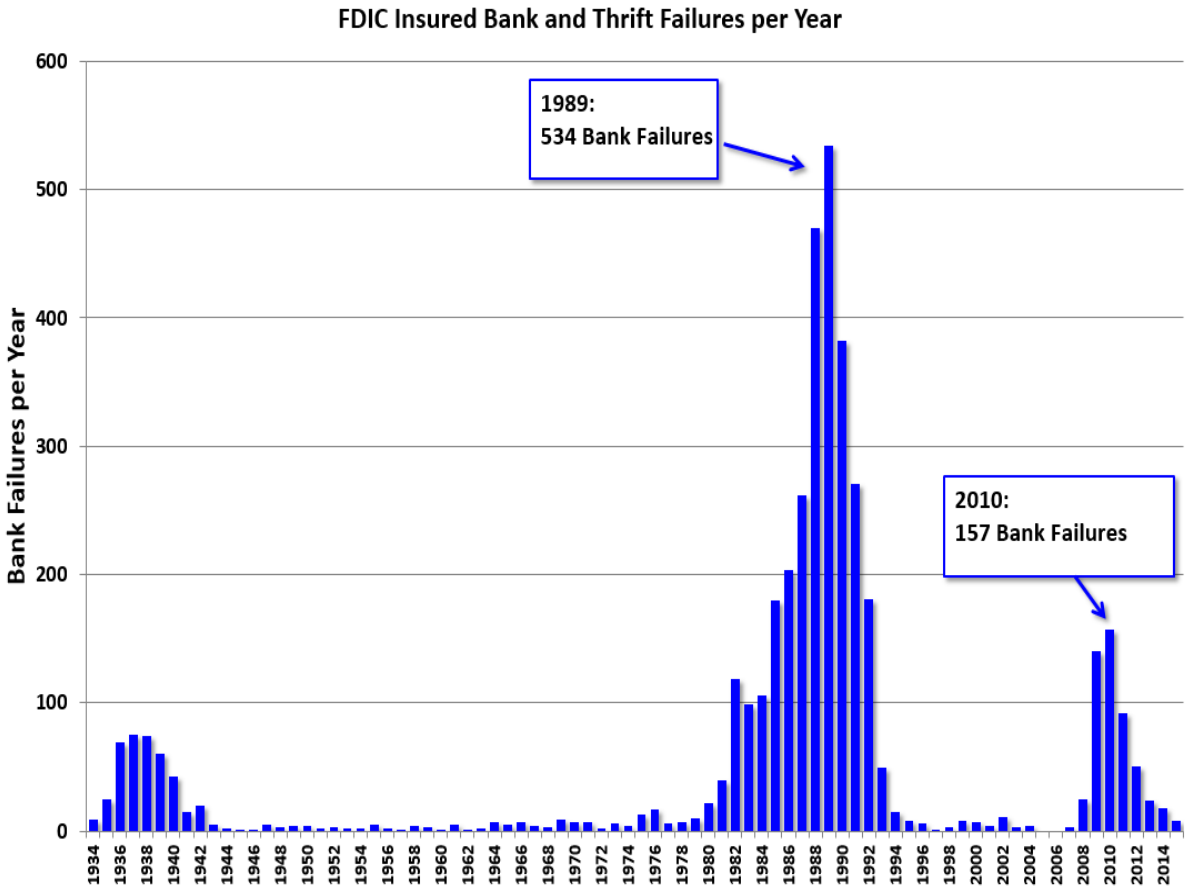
Some operational risks are insurable while the bank would have to directly bear losses from the others.

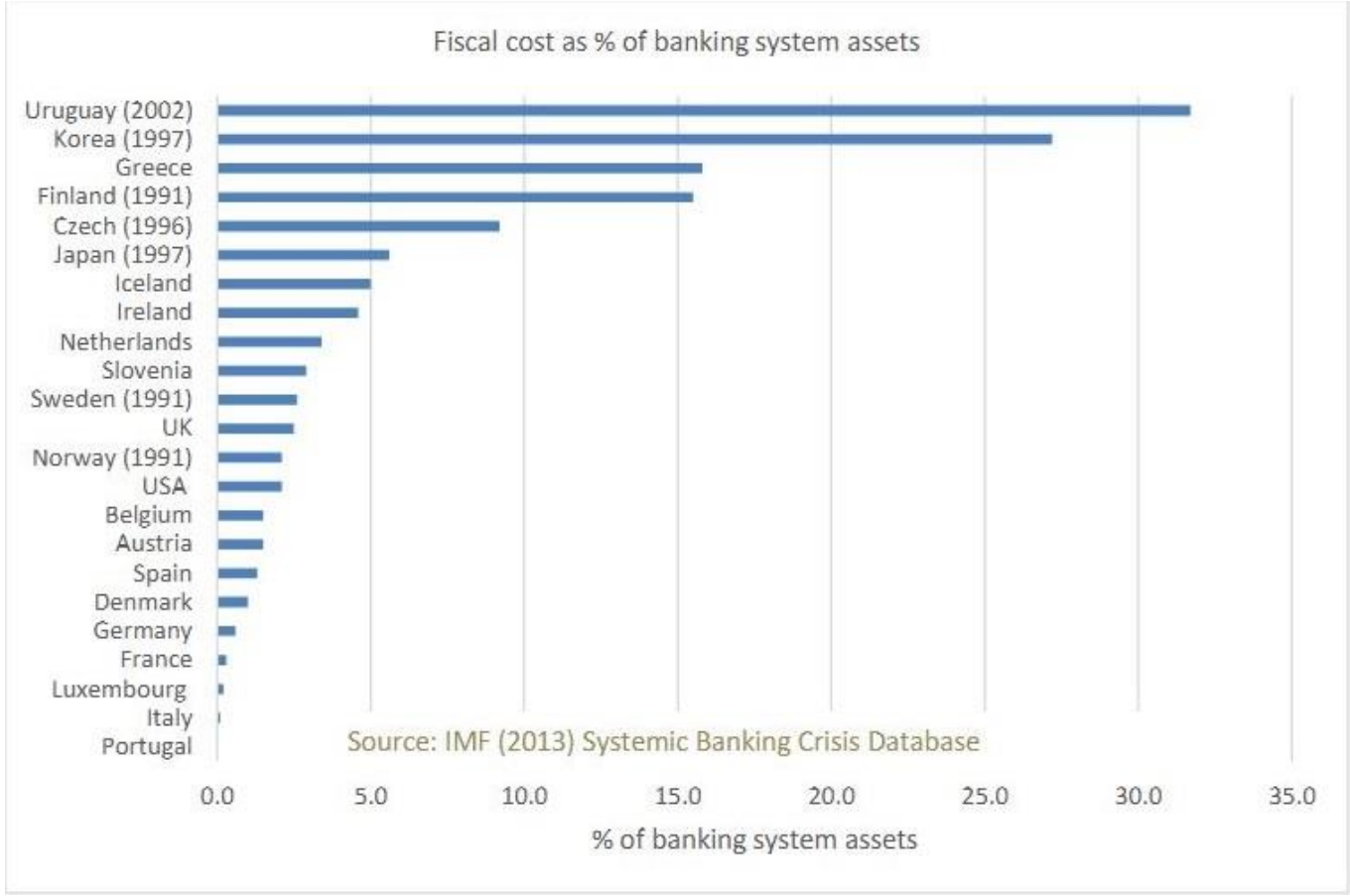
Background of banking regulation

- Systemic banking crises are considered to be one of the most severe with long-lasting consequences;
- The global recession left in its wake a worldwide increase of 30 million in the number of people unemployed.
- World per capita output, which typically expands by about 2.2 percent annually, contracted by 1.8 percent in 2009, the largest contraction the global economy experienced since World War II.
- The map to the right outlines 2009 GDP growth rates.
- Second map is 2011



Bank failures during crises and the associated costs





Notable banking regulators

Global regulators:

- Bank for international Settlements (BIS);
- Financial Stability Board (FSB).

Regional regulators:

- Federal Reserve (Fed, US);
- European Central Bank (ECB, EU);
- Local central banks and agencies, for example:
  - Prudential Regulation Authority (PRA, UK);
  - Hong Kong Monetary Authority (HKMA, HK).

Goals and mandates:

- Financial stability;
- Banking supervision;
- Monetary policy.

Basel regulation: important concepts

$$Capital\ Adequacy\ Ratio\ (CAR) = \frac{Regulatory\ Capital}{Risk\ Weighted\ Assets} \geq 8\%$$

Regulatory capital (RC) is the amount of capital a bank or other financial institution has to hold as required by its financial regulator. It consists of:

- Tier 1 capital (CET1):
  - Common shares;
  - Retained earnings;
  - Stock surplus;
- Additional Tier 1 capital (AT1):
  - Qualifying AT1 instruments;
  - Stock surplus (for AT1);
- Tier 2 capital (T2):
  - Qualifying T2 instruments;
  - Stock surplus (for T2);
  - Certain loss provisions.

- CET1 capital is the most subordinated;
- AT1 capital is subordinated to depositors, general creditors, subordinated debt and has the following characteristics (not limited to):
  - Unsecured;
  - Perpetual;
  - Callable in >5 years with supervisory approval;
  - no credit-sensitive dividends;
  - Convertible.
- T2 capital is subordinated to depositors, general creditors and has the following characteristics (not limited to):
  - Unsecured;
  - Maturity >5years with straight line amortization;
  - Callable in >5 years with supervisory approval;
  - No credit-sensitive dividends.

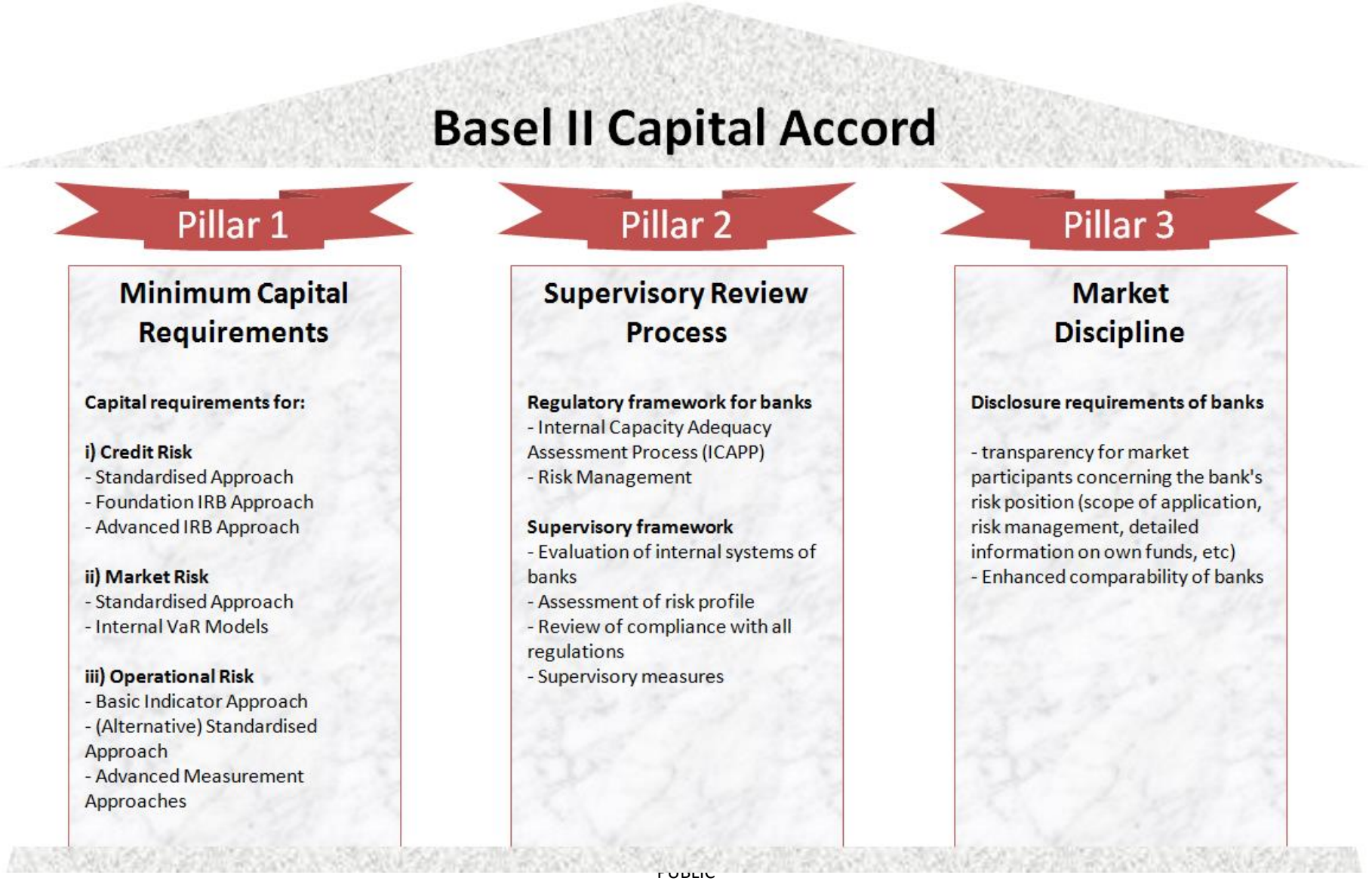
Banking regulators can impose additional capital buffers on top of the initial requirements:

- Capital Conservation Buffer (0-2.5%);
- Countercyclical Capital Buffer (0-2.5%);
- Buffer for Global Systemically Important Banks (G-SIB, 0-2.5%);
- Systemic Risk Buffer (0-2.5%);
- Other buffers.

Risk Weighted Assets (RWA) is a bank's assets or off-balance-sheet exposures, weighted according to their risk. Calculation formula of total RWAs include:

- credit risk;
- market risk;
- operational risk.

Basel II: pillars



Basel III

It incorporates risks of macroeconomy (through capital buffers) and new liquidity and leverage indicators.

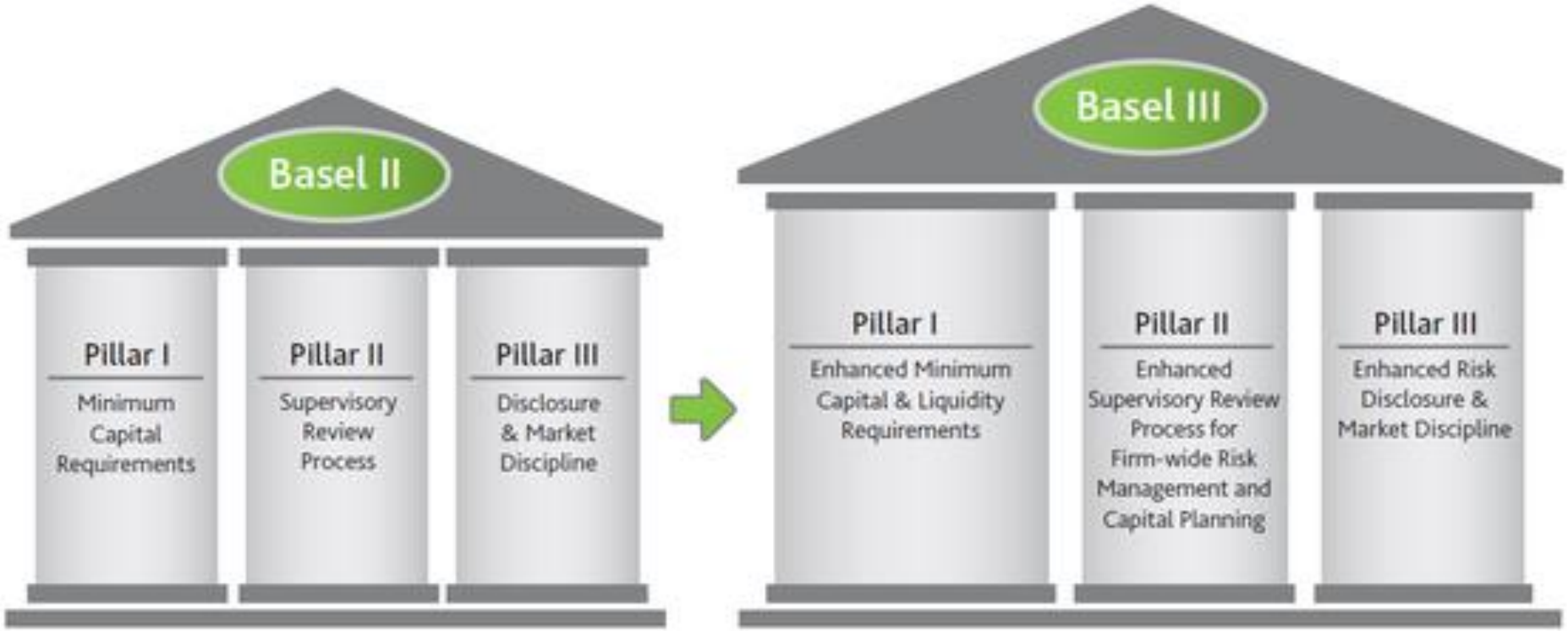
$$Leverage\ Ratio = \frac{Tier\ 1\ capital}{Exposure\ Measure} \geq 3\%$$

- A short term ratio (LCR) with a 30 days time horizon :

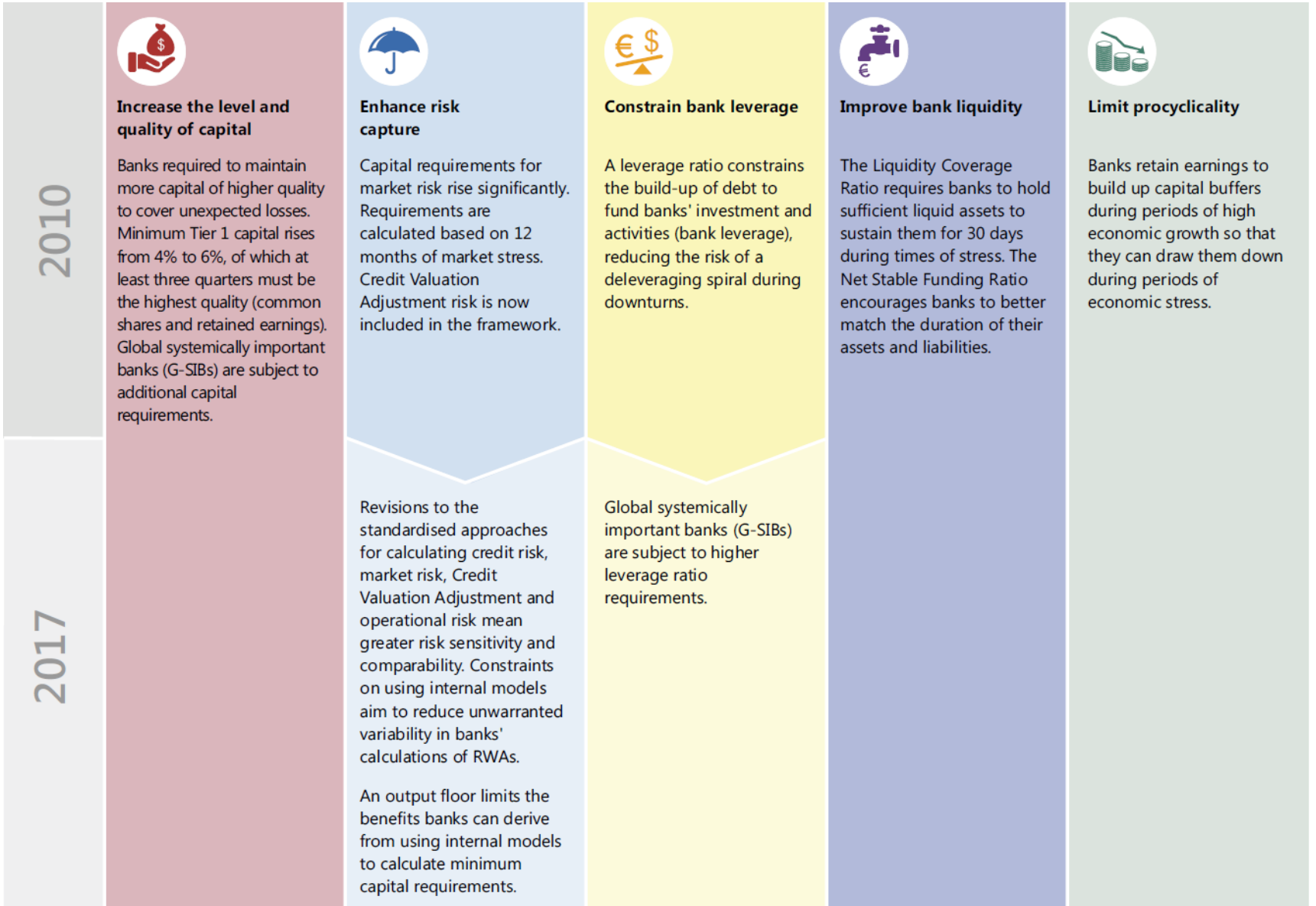
$$\text{Liquidity Coverage Ratio} = \frac{\text{Stock of High Quality Liquid Assets}}{\text{Total Net cash outflow over 30 days}} \geq 100\%$$

- A long term ratio (NSFR) with a 1 year time horizon relying on regulatory factors defined for stress test scenarios

$$\text{Net Stable Funding Ratio} = \frac{\text{Available stable funding}}{\text{Required stable funding}} \geq 100\%$$



Final Basel III reforms (Basel IV)



Capital overview

Capital adequacy metrics

	At	
	31 Dec 2023	31 Dec 2022
Risk-weighted assets ('RWAs') ($bn)		
Credit risk	**683.9**	679.1
Counterparty credit risk	**35.5**	37.1
Market risk	**37.5**	37.6
Operational risk	**97.2**	85.9
Total RWAs	**854.1**	839.7
Capital on a transitional basis ($bn)		
Common equity tier 1 ('CET1') capital	**126.5**	119.3
Tier 1 capital	**144.2**	139.1
Total capital	**171.2**	162.4
Capital ratios on a transitional basis (%)		
Common equity tier 1 ratio	**14.8**	14.2
Tier 1 ratio	**16.9**	16.6
Total capital ratio	**20.0**	19.3
Capital on an end point basis ($bn)		
Common equity tier 1 ('CET1') capital	**126.5**	119.3
Tier 1 capital	**144.2**	139.1
Total capital	**167.1**	157.2
Capital ratios on an end point basis (%)		
Common equity tier 1 ratio	**14.8**	14.2
Tier 1 ratio	**16.9**	16.6
Total capital ratio	**19.6**	18.7
Liquidity coverage ratio ('LCR')		
Total high-quality liquid assets ($bn)	**647.5**	647.0
Total net cash outflow ($bn)	**477.1**	490.8
LCR (%)	**136**	132
Net stable funding ratio ('NSFR')		
Total available stable funding ($bn)	**1,601.9**	1,552.0
Total required stable funding ($bn)	**1,202.4**	1,138.4
NSFR (%)	**133**	136

Risk-weighted assets

RWAs by global business

	WPB $bn	CMB[1] $bn	GBM[1] $bn	Corporate Centre $bn	Total RWAs $bn
Credit risk	**155.3**	**319.1**	**131.5**	**78.0**	**683.9**
Counterparty credit risk	**1.9**	**1.5**	**32.0**	**0.1**	**35.5**
Market risk	**1.3**	**1.0**	**22.2**	**13.0**	**37.5**
Operational risk	**34.4**	**32.9**	**32.8**	**(2.9)**	**97.2**
At 31 Dec 2023	**192.9**	**354.5**	**218.5**	**88.2**	**854.1**
At 31 Dec 2022	182.9	342.4	225.9	88.5	839.7

1 *In the first quarter of 2023, following an internal review to assess which global businesses were best suited to serve our customers' respective needs, a portfolio of our customers within our entities in Latin America was transferred from GBM to CMB for reporting purposes. Comparative data have been re-presented accordingly.*

WPB = Wealth Management and Private Banking
CMB = Commerical and Merchant Banking
GBM = Global Banking and Markets

Future of banking

"Progress is cumulative in science and engineering, but cyclical in finance."

James Grant

HSBC

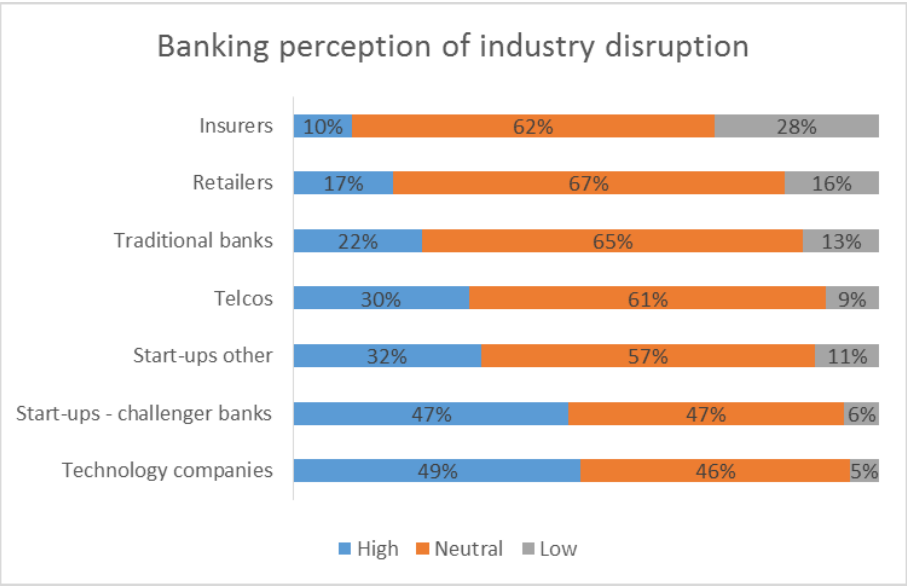
New market participants

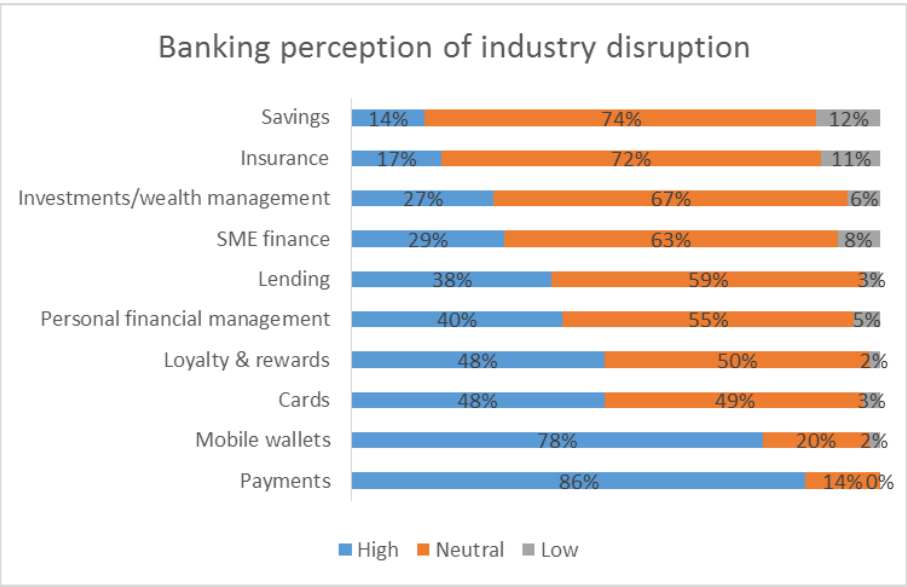
Fintech firms: initially there was more competition with banks, and then more collaboration because:

- Fintechs have:
  - Innovation mindset;
  - Agility (speed to adjust);
  - Consumer-centric perspective;
  - An infrastructure built for digital.
- Banks have:
  - Scale;
  - Stronger brand recognition;
  - Established trust;
  - Adequate capital;
  - Knowledge of regulatory compliance;
  - An established distribution network.

Large tech companies are larger threat because many of the tech giants possess the following:

- digital prowess;
- large customer bases;
- well versed in improving the customer experience;
- ample leeway to extend their corporate brands into banking;
- some of these firms are generating a level of trust previously reserved only for traditional banks.





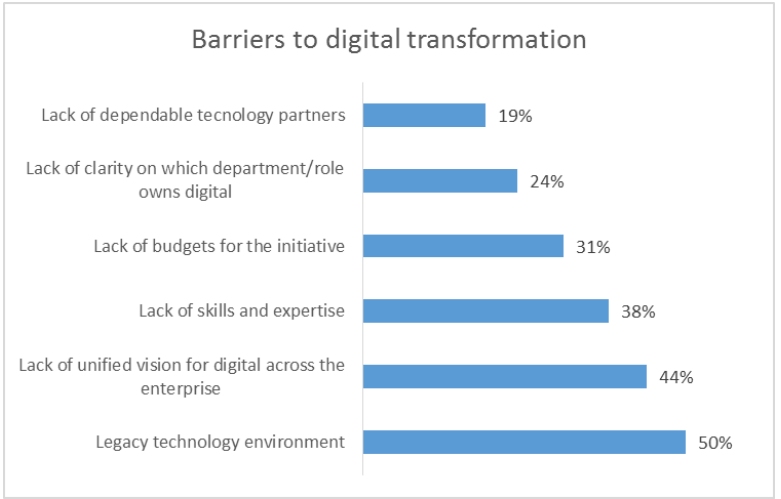
Key innovation clusters and how they map to the core functions of financial services

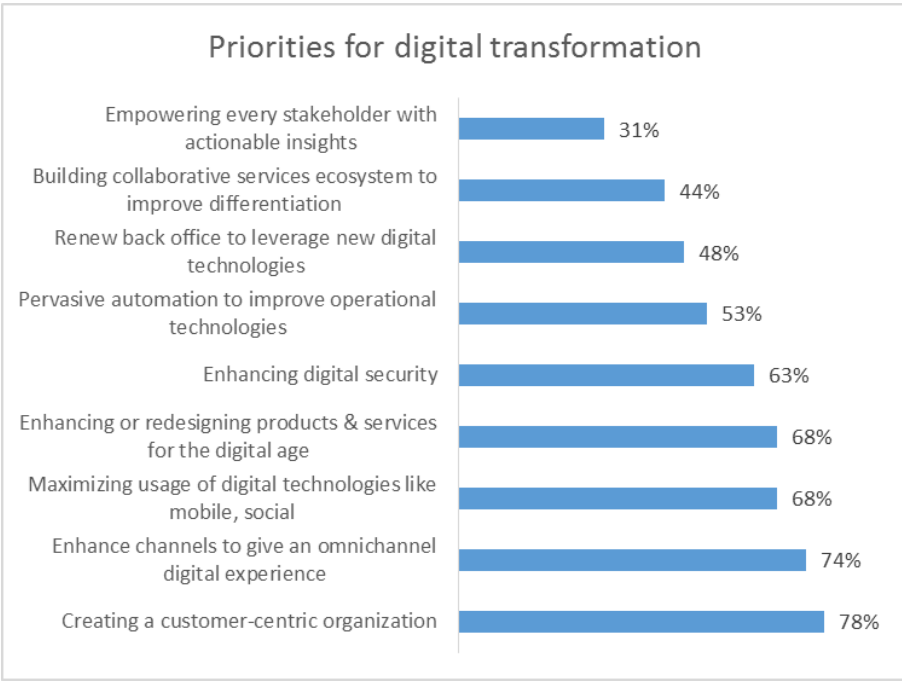
Digitization

- Automation of front, middle and back office operations.
- Agile way of working in banks.
- Number of bank branches will reduce, and they will become more digital.
- Shift from traditional to electronic channels of interactions with clients.
- Emergence of digital only banks.
- New risks:
  - Cybersecurity;
  - Attrition of highly skilled IT staff.

Open Banking is a financial services term as part of financial technology that refers to:

- The use of open APIs that enable third-party developers to build applications and services around the financial institution.
- Greater financial transparency options for account holders ranging from open data to private data.
- The use of open-source technology to achieve the above.





Blockchain

A blockchain is a growing list of records, called blocks, which are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data.

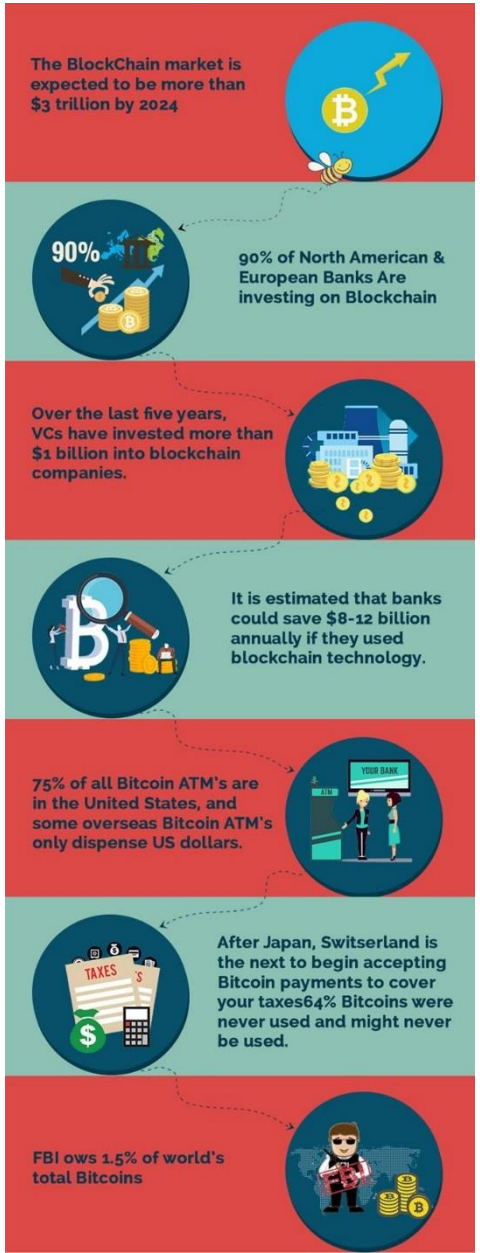
Examples of use in banks:

- Clearing and settlements;
- Payments;
- Trade finance;
- Identity (verification of customers and counterparties);
- Syndicated loans.

HSBC use case of blockchain:

HSBC completed the world's first fully paperless cross-border transactions using blockchain technology (October/November 2018).

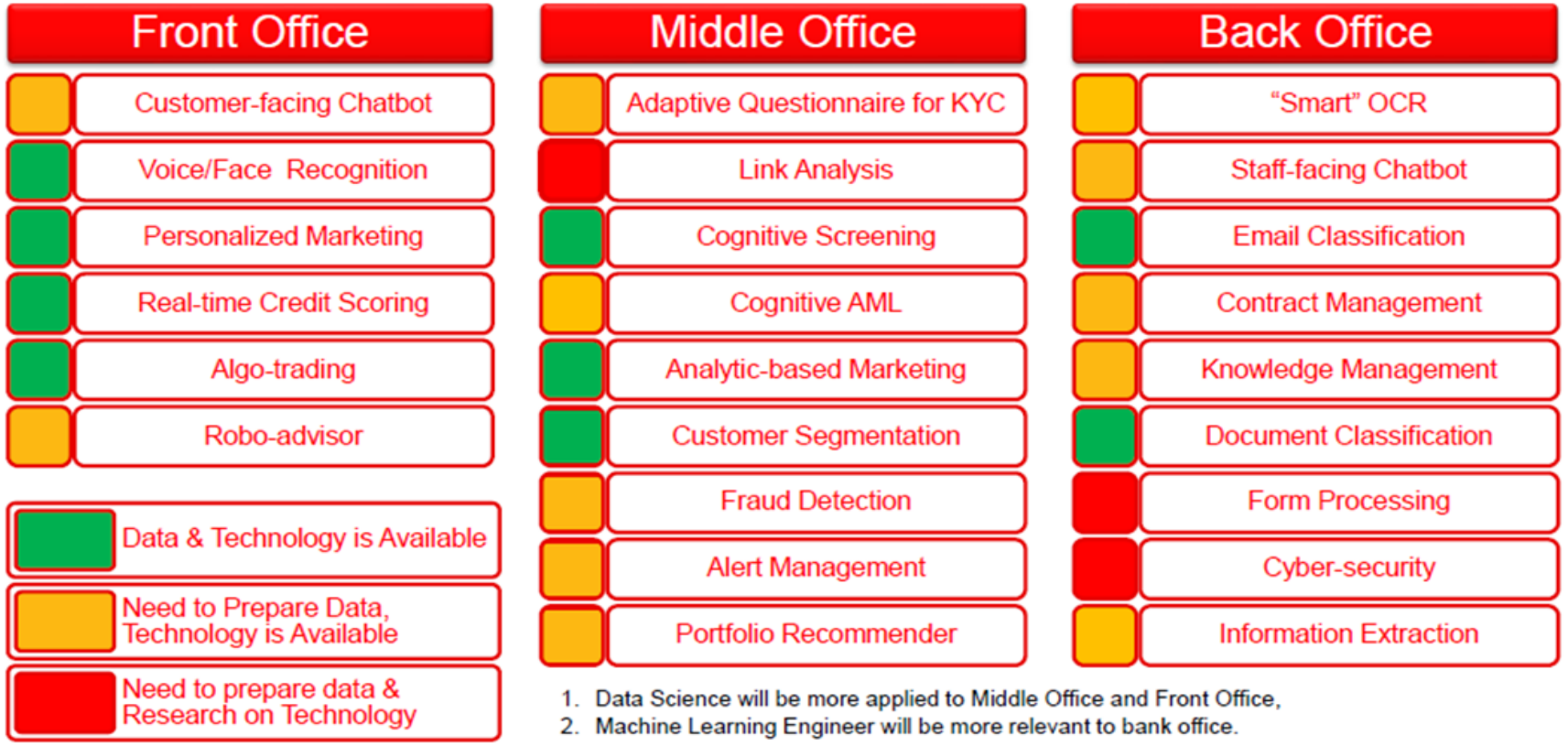
HSBC platform using blockchain technology takes an end-to-end view and holds the promise of completely eliminating paper, which can help clients to securely complete deals in less than 24 hours, instead of up to 10 days.



Data science and artificial intelligence

Data science is an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from data in various forms, both structured and unstructured.

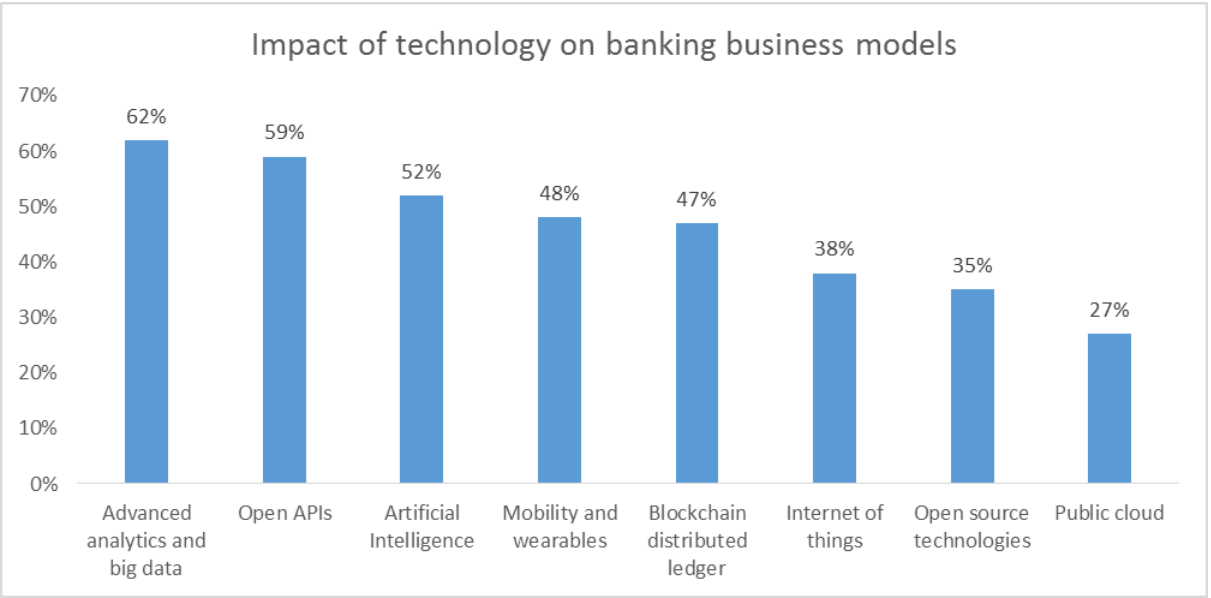
Machine learning (ML) is the scientific study of algorithms and statistical models that computer systems use to effectively perform a specific task without using explicit instructions, relying on models and inference instead.



Consumer immersion

Customers want their banks to understand them, to provide solutions tailored to them and to speak to them in a voice that is for them alone.

- The Capgemini/Efma World Retail Banking Report 2017 finds that 49.5 percent of consumers report positive experiences with retail banks, while 57.8 percent of consumers report positive experiences with non-traditional financial institutions;
- PwC's 2018 Digital Banking Consumer Survey found that 46 percent of banking customers are now digital only.



Future success of banks will depend on the ability to:

- collect and analyze massive data sets (using advanced analytics);
- learn from the insights to improve personalization and digital engagement in real-time;
- expand offerings in response to consumer needs;
- show empathy to clients.

Conclusions

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Conclusions

- Banking has a long history of evolution and change.
- Banks (and the way they earn money) can be very different.
- Managing banks and their risks is a complex/sophisticated process.
- Due to high importance of banks in economy, they are heavily regulated.
- Quick development of technology in the recent years can disrupt traditional ways of banking.
- Using advanced technologies and being customer-centric is the key to success.

As financial and technology organizations embrace a broader view of banking, offering both banking and non-banking services, the ultimate winner will be the consumer regardless of which provider they select.

Thank you for your attention, looking forward to your questions!

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References and reading materials

1) History of banking: https://en.wikipedia.org/wiki/History_of_banking
2) Role of banks: https://www.frbsf.org/education/publications/doctor-econ/2001/july/bank-economic-function/; https://courses.lumenlearning.com/macroeconomics/chapter/the-role-of-banks/
3) Banking business models: https://www.investopedia.com/terms/c/commercialbank.asp; https://www.investopedia.com/terms/r/retailbanking.asp; https://www.financialplannerworld.com/private-banking/; https://www.economicshelp.org/blog/67/money/money-multiplier-and-reserve-ratio-in-us/; https://www.investopedia.com/terms/u/universalbanking.asp; https://www.investopedia.com/terms/i/investment-banking.asp
4) Bank's structure: https://warwick.ac.uk/services/careers/findingwork/jobsectors/banking/which_division_is_right_for_me_nov15doc_1.pdf
5) Stakeholders: https://www.investopedia.com/terms/s/stakeholder.asp
6) HSBC Group results and announcements: https://www.hsbc.com/investors/results-and-announcements
7) Consequences of Banking Crises: https://www.boundless.com/economics/textbooks/boundless-economics-textbook/economic-crises-33/fundamentals-of-banking-crises-132/consequences-of-banking-crises-525-12621/
8) Corporate governance principles for banks: https://www.bis.org/bcbs/publ/d328.pdf
9) Bank Failures and the Cost of Systemic Risk: https://www.fdic.gov/bank/analytical/cfr/2009/wp2009/CFR_WP_2009_06KupiecRamirez.pdf
10) Basel II: revised international capital framework: http://www.bis.org/publ/bcbsca.htm
11) Basel III: international regulatory framework for banks: https://www.bis.org/bcbs/basel3.htm
12) Basel III: Finalizing post-crisis reforms: https://www.bis.org/bcbs/publ/d424.htm
13) The Future Of Banking: Fintech Or Techfin? https://www.forbes.com/sites/jimmarous/2018/08/27/future-of-banking-fintech-or-techfin-technology/#2a6509c45f2d
14) Open Banking: https://en.wikipedia.org/wiki/Open_banking
15) Blockchain: https://en.wikipedia.org/wiki/Blockchain
16) Five ways banks are using blockchain: https://www.ft.com/content/615b3bd8-97a9-11e7-a652-cde3f882dd7b
17) Data science: https://en.wikipedia.org/wiki/Data_science
18) Machine learning: https://en.wikipedia.org/wiki/Machine_learning
19) New Competitors Forcing Banks to Reevaluate Innovation Strategies: https://thefinancialbrand.com/62084/banking-innovation-fintech-disruption/
20) The Future of Financial Services: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

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