



Introduction to Finance

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Introduction

The objective of this book is to describe the key elements and concepts of finance by guiding the reader with its question and answer structure later utilizable as exam questions as well.

The book adheres to the following structure: the first two chapters define the key concepts of the financial system by answering questions about commercial banking, monetary policy and financial markets. The third chapter summarizes the basic facts about public finance. However, all of these findings are always embedded into the underlying socio-economic background, this is why chapter four underlines the historical consequences. In the last chapter system level dynamics are illustrated on a five-actor model featuring households, the corporate sector, foreign investors, commercial banks, state and central banks. There is a glossary of definitions at the end of the book containing all relevant terms from the ECB Glossary database.

Business Administration and Management – KKK adequacy:

- Competences: knowledge of the basic concepts of finance and an understanding of the basic macro- and micro level interactions among economic actors both on domestic and international levels.
- Skills: an ability to estimate the impacts and results of complex economic procedures.
- Attitude: an openness to understand the economic environment around a company and willingness for collecting and processing information.
- Autonomy: an ability to perform pre-defined operations autonomously and under supervision as well.

Chapter I: Money and Banking

The first chapter covers the basic functions of the banking system and highlights the importance of the central bank.

1. Lending

a. *Why do we need lending?*

We have to maintain our operations until we get our revenues on the one hand or the price of desired assets exceeds our yearly income. If an asset is expected to have a long lifespan it is reasonable to finance it for a longer period.

b. *What is funding and market liquidity?*

Every loan should have a collateral in case of bankruptcy. In this case, the new owner of collateral will be the creditor but it would like to get its money back, so it has to sell the asset. If the asset is easy to sell on the market, then the creditor's risk will be lower. When there is a limited demand on the market for the asset – because it is unique or demand is shrinking – the risk will be bigger. Funding liquidity (sometimes called balance sheet liquidity) is an ease in funding, "to raise cash either via the sale of an asset or by borrowing". Market liquidity "is the ability to trade an asset or financial instrument with little impact on its price." (BIS 2011¹)

Thus, lending conditions are always related to the demand for the underlying product.

c. *Why to pay interests? What is represented in the interest?*

Interest is related to different risk factors of lending:

- longevity (time),
- probability of partner (and country) default,
- marketability (ability to sell the underlying asset on the market),
- inflation (changes in the purchasing power of the money),
- macroeconomic balance between domestic savings and lending (supply and demand for money).

¹ <http://www.bis.org/publ/cgfs45.htm>

The state is the most secure debtor in every country because of special abilities (taxation, public properties). Short term loans have lower risk compared to longer term ones. The private sector is represented by households and companies.

d. How can we get funding?

There are many funding channels. There can be a direct connection between creditor (investor) and debtor where the creditor bears all of the lending-related risk (like giving money to someone for future repayment or through issuing and buying a bond). Indirect channel contains a risk-bearer middleman which absorbs all of the risks related to the lending activity (like commercial banks). It has a special expertise in monitoring the debtor's ability to repay the debt. Direct lending is more popular in Anglo-Saxon countries while indirect lending is preferred more in continental Europe.

e. Why commercial banks are so special – and dangerous

Commercial banks are collecting (mostly) short term savings (*bank deposits*) and are (mostly) lending them in the form of long term loans (*maturity transformation*). This means that their operations are made from client-money (*external capital*) and not from the money of the bank's owners (*shareholders equity*). Shareholders equity is a buffer to absorb lending-related losses to insulate bank deposits from lending-related losses. Financial stability is a "stable provision of financial intermediation services to the wider economy (payment services, credit intermediation and insurance against risk)" (IMF 2014²). Financial stability is related to the low ratio of nonperforming loans as well as to the willingness of the private sector to put their savings into bank deposits. If the general trust in the banking system is shaken depositors may want to take their savings out ("bank-run") but since this money had already been lent out in the form of long term loans the banks are going to default. Financial supervision and central banks exist to avoid such bank-runs. Bank prudence is the management's focus on the long-term viability of the organization (the repaying of loans). Bank liquidity means the bank's ability to meet its short-term financial obligations, while solvency focuses on meeting long-term ones. Macroprudential perspective represents the goal of ensuring the resilience of the financial system, stabilising the supply and cost of credit during upswings and downturns by allowing buffers of regulatory capital (IMF 2014). Probability of bank-runs are limited by

² <http://www.imf.org/external/pubs/ft/wp/2014/wp14214.pdf>

deposit insurance facilities (deposits are repaid within 20 days if a bank becomes insolvent under 100 000 Euro³) and by caps on loan to value ratios, limits on credit growth, (countercyclical) capital and reserve requirements and surcharges (IMF 2014).

Bank deposit can be collected by banks only – otherwise the depositor is a subject of lending-related risks!

f. How do bonds work?

A bond is a credit note. It is issued on market price and purchased back by the issuer at par value when expired. Usually it pays an interest as well (short term bonds like treasury notes don't pay interest). The investor's profit (*yield*) is realized through price gain on par value-market value differential and interest. The primary market is where initial issuance and market demand meet each other, while the secondary market is about ordinary trading operations. Bondholders can lose their money when their debtor goes default. Therefore, bond quality is rated by credit rating agencies to visualize probability of bankruptcy. Major bond issuers are states, banks and (big or medium) companies.

2. Monetary policy, central banking and money

g. How commercial banks, households, companies and the state are related to each other?

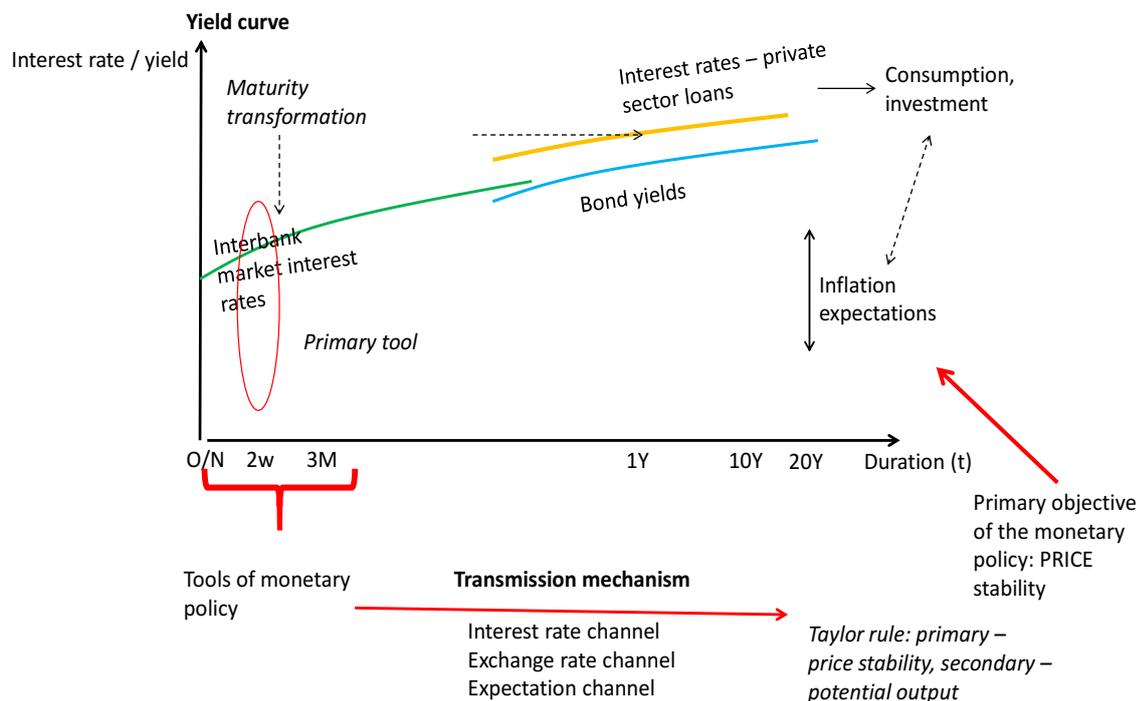
Households split their income between consumption and savings. Savings can be invested into bank deposits (indirect lending circle), bonds (direct lending circle), equity (buying an ownership in a company), insurance, or other property (housing, real estates). Bank deposits are accumulated by the banking system and are lent out to companies and households. The state collects revenues via taxation and issues government bonds when expenditures are exceeding its incomes (budget deficit). Companies shall accumulate shareholders' equity, take up loans or issue corporate bonds in order to acquire assets (buildings, machinery, software etc.) for their operations. A company is profitable when its expenditures on salaries, raw material etc., paid interests and taxes altogether are lower than its incomes.

³ <http://www.oba.hu/en/deposit-insurance>

h. How direct and indirect lending is managed by central banks?

Commercial banks shall put a percent of their deposits into the central bank as a deposit (*mandatory reserve*); while they can take up a loan from the central bank as well (commercial banks should have acceptable collateral – like government bonds or other securities). Therefore, the central bank can influence interest rates and lending activity through its *key policy interest rate* (or *prime rate*). The bond market is managed via purchase⁴ (*outright operations*), repurchasing operations (*repo*: buying the bond today on a discounted price with the seller having to buy it back on a pre-defined day with a pre-defined price) or through the list of acceptable collaterals during lending. Increased interests rate decreases lending, because only projects with low risk or high profitability can be financed – therefore it slows down economic growth.

The transmission mechanism of the monetary policy and the yield curve



Source: author's edition

⁴ Central banks are not allowed to purchase government bonds on the primary market. It would bias market's pricing ability and would mix central banking with commercial banking functions. So it is prohibited.

i. *What is behind the value of money?*

Money value has an “internal” and an “external” representation – while internal value is related to the purchasing power of the money, external value is represented by its foreign exchange rate.

The amount of money should be reflecting the supply-demand balance of product and services (goods) in an economy. When the supply of goods is increasing faster, there will be a shortage in money with *deflation* as a result. When the demand for goods is increasing faster, prices will increase – causing *inflation*. Market demands for goods are often financed from borrowed funds – therefore the interest rate and the overall lending policy have an indirect influence on the value of money.

We can distinguish among different forms of money (*monetary aggregates*): physical cash and coin (M0), demand deposits, traveller’s checks (M1), savings deposits, money market shares (M2), time deposits and institutional funds (M3) to reflect on the mobility and availability of money. The central bank creates money on the liability side of its balance sheet, where we can find physical cash, coin, commercial banks deposits and central bank bonds. Commercial banks are lending out depositors’ money, where interests are increasing the amount of money in the system.

The external value or foreign exchange rate is managed by the central bank from its currency reserves on the asset side. A currency can have a fixed exchange rate to another currency (*pegging*) with a narrow +/- 2% fluctuation band, like “RMB exchange rate was 6.27 yuan per U.S. dollar”. The exchange rate is managed through interventions by the central bank: direct intervention is when the CB sells or buys domestic currency for foreign currency (the CB can sell foreign currency only from its currency reserves); while indirect intervention can be made via interest rate changes (an increased interest rate provides an interest premium against other currencies making our currency more attractive for foreign investors). Managed floating means a high degree of freedom for market forces, usually with a +/- 15% fluctuation band, while under independent floating the CB has no exchange rate preference at all.

j. *What defines the foreign exchange (FX) rate?*

The FX rate can be defined by the central bank directly (peg with fluctuation band) or indirectly (interest rate premium by International Fisher Effect

$\frac{\text{domestic interest rate} - \text{domestic inflation}}{\text{foreign interest rate} - \text{foreign inflation}}$ if $> 0 \rightarrow$ *currency appreciates*, if $< 0 \rightarrow$

currency depreciates). It can be affected by the external balance of the country: foreign trade, capital flows – capital import or export, while the usage of foreign capital in domestic lending can be an especially important factor in the medium run. But pricing in the short run depends on the demand-supply balance only, dominated by forces of psychology.

k. *What is the primary objective for a central bank?*

There is no “ultimate” objective, only a mix of frameworks to focus on the FX rate, lending or inflation. According to The IMF’s Classification of Exchange Rate Arrangements and Monetary Policy Frameworks database⁵, most of the countries in the world had chosen some sort of “*Exchange rate anchor*” (peg, band, crawling peg/band, currency board) with USD (2008: 66), Euro (2008: 27) as reference currency. Some of them preferred “*Monetary aggregate target*” (2008: 22) only, while developed economies focused on “*Inflation targeting framework*” (2008: 44) or followed a mixed framework (2008: 11).

l. *What is the exchange rate anchor?*

The monetary authority buys or sells foreign exchange (currency) to maintain the exchange rate at its predetermined level or within a given range. Classification as an *exchange rate arrangement with no separate legal tender* means that the currency of another country circulates as the sole legal domestic currency (formal dollarization). *Currency board* means that domestic currency is usually fully backed by foreign assets eliminating traditional central bank functions such as monetary control and lender of last resort, and leaving little room for discretionary monetary policy (so: the amount of money is strongly related to the amount of FX reserves!). *Conventional peg* means that the currency is fixed to another currency at a predefined rate or a basket of currencies, where the basket is formed, for example, from the currencies of major trading or financial partners and weights reflect the geographic distribution of trade, services or capital flows. *Crawling peg* means that the currency is adjusted in small amounts at a fixed rate or in response to changes in selected quantitative indicators such as past inflation differentials vis-à-vis major trading partners or differentials between the inflation target and expected inflation in a major trading partner.

⁵ <http://www.imf.org/external/np/mfd/er/2008/eng/0408.htm>

Advantages: stable FX rates increases foreign trade (no FX fluctuation), price level changes (inflation) will be connected to the host country's developments (rule of single price).
Disadvantages: requires infinite amount of foreign exchange reserve for future interventions, miss-pegging is possible (currency is too strong, domestic economy lost its price-competitiveness abroad), rigid.

m. Why is the exchange rate anchor not preferred in developed countries?

Due to the experiences of gold standards, Breton Woods system, ERM (Madura 2008).

Gold standard (1820/74-1914)

Paper money is fully convertible to gold for everyone – the amount of gold reserves and money quantity was balanced at the time and gold reserves had homogenous distribution among capitalist countries. Main dilemma: the amount of gold available can be slowly increased by mining while the economy is growing due to continuous growth in productivity (1st and 2nd industrial revolution) - smooth deflation at that time. By the end of the 1st World War the result was an economic chaos (France and Great Britain indebted towards the US, Germany, Austria, Hungary had to pay enormous reparations, losses in manpower, decreased demand and overproduction).

Bretton Woods Agreement (1944 – 1971/73)

Western European exchange rates were fixed to US dollar (+/- 1% band) and the U.S. dollar was valued as 1/35 ounce of gold (half of the world's gold reserves were in the US). European economies had to rebuild from scratch, external macro balance was supported by IMF lending, project financing for physical infrastructure programs were supported by the International Bank for Reconstruction and Development ("World Bank") and the Marshall-plan. There were no fiscal rules for participant countries, Western European countries happily accumulated excess US dollars until the end of the 1960s. The Cold War increased the US budget deficit (weapon programs, Korean and Vietnamese Wars, NATO capabilities, space program etc.) with an increased inflation for 1969. International raw material prices became undervalued while German and Japanese economies became significant again. Smithsonian Agreement (1971-1973): devaluation of the U.S. dollar by about 8 percent against other currencies. In addition, boundaries for the currency values were expanded to within 2.25 percent above or below the rates initially set by the agreement. The result was increased

inflation and economic stagnation (*stagflation*) until 1979 with increasing oil prices and volatile FX rates.

European Monetary System (EMS, 1979-1992)

Under the EMS, exchange rates of member countries were held together within specified limits and were also tied to the European Currency Unit (ECU), which was a unit of account. Its value was a weighted average of exchange rates of the member countries; each weight was determined by a member's relative gross national product and activity in intra-European trade. The currencies of these member countries were allowed to fluctuate by no more than 2.25% from the initially established values. Without general rules about economic and fiscal policy, fears of GBP and Italian Lira devaluation resulted in a huge speculative attack kicking these currencies out of EMS. The ERM II system was introduced with +/- 15% fluctuation band but the introduction of one single currency (Euro) with a common monetary policy (represented by the European Central Bank) became necessary.

n. What is “monetary aggregate targeting” or “pragmatic monetarism”?

Policy makers are assuming a function-based relationship between money supply, price level and output. If you are able to manage reserve money, M1, or M2 aggregates, you will have an impact on price level and output as well. The strategy was used in the US between 1979 and 1982 to fight against stagflation with a shock therapy: inflation became the main enemy regardless to growth. High inflation between 1965 and 1980 partially was a result of negative interest rate policy of the US FED (lazy fiscal policy also had an impact on it as well), because they tried to increase economic output with cheap lending.

Commercial bank reserves were regulated by the FED and the yield curve became the subject of market forces. Interest rates and bond yields were booming while banks suffered from liquidity scarcity. Pragmatic monetarism had some weaknesses: the link between money supply and monetary base is tenuous; information is available only with a lag while the framework increased volatility of interest and/or exchange rates (Benati-Goodhart 2011). More than 1000 US banks which lent money with long term fixed interest rates before 1979 went in default (“US savings bank crisis”). However, inflation decreased and economic growth started again.

Pragmatic monetarism had its side effects on global economics too: Mexico, Brazil and Argentina declared default while Hungary became the member of the IMF (in 1982!) with Chinese support to avoid default. The Polish communist party was cued by the Polish army for Soviet suggestion to avoid the further escalation of economic crisis. All of these countries took up many cheap loans in the 1970s but most of them were not utilised to increase their productivity.

Lesson: when we are afraid of inflation and the problem can be solved through lending policies, then why not focus only on inflation?

- Poole's analysis: interest rate is a better tool than money supply (Fender 2012).
- Goodhart's law: „any observed statistical regularity will tend to collapse once pressure is placed on it for control purposes” (Fender 2012).

o. Inflation targeting – Price stability

Setting the interest rate in order to meet an inflation target. Inflation is measured by the Consumer Price Index in the medium run (expectations for 1-2 years). Short term interest rate management has three channels: lending, FX rate and expectation channels. Lending is related to consumption, investment, public debt – changes in key policy interest rate will have an impact on interest rates of the commercial bank deposits and (due to maturity transformation) bank loans⁶. This is the process through which monetary policy decisions affect the economy in general, and the price level in particular is called transmission mechanism (Issing et al. 2001).

The exchange rate channel represents how exchange rate movements affect the domestic price of imported goods. Imports are used as inputs into the production process, lower prices for inputs result in lower prices for final goods. Import prices are related to the competitiveness of domestically produced goods on international markets. The strength of exchange rate effects depends on how open the economy is to international trade. The expectations channel influences the private sector's longer-term expectations. Its effectiveness crucially depends on

⁶ Official interest rates → market interest rates → expectations → saving and investment decisions → a change in aggregate demand and prices → asset prices → the supply of credit → the overall risk-taking behaviour of the economy (ECB 2011).

the credibility of the central bank's communication, how it is able to guide economic agents' expectations of future inflation thereby influencing their wage and price-setting behaviour.

Price stability is good, because of many reasons:

- it allows the market to allocate resources more efficiently
- creditors can be sure that prices will remain stable in the future,
- it does not demand an “inflation risk premium”,
- it is effective against stockpile real goods,
- tax and welfare systems can create perverse incentives which distort economic behaviour,
- inflation acts as a tax on holdings of cash,
- maintaining price stability prevents redistribution of wealth and income in inflationary environments,
- sudden revaluations of financial assets undermine the soundness of the banking sector's balance sheets and decrease households' and firms' wealth (ECB 2011).

Lesson: it works because when a country introduced it in the past, inflation decreased sooner or later.

- Tinbergen principle: a policy maker needs as many instruments as targets. Instrument is a tool the policy maker has control over that he uses to try to achieve his target (Fender 2012).
- „Obliquity”: the best way to achieve a goal is to pursue some other goal rather than the goal itself (Fender 2012).

p. How can we describe the relationship between key policy rate, inflation and economic output nowadays?

US FED de jure, ECB de facto (Hamori – Hamori 2010) follows the so-called Taylor-rule, which is an augmented version of inflation targeting: the central bank is allowed to support economic growth until it is not in conflict with price stability. The Taylor-rule defines key policy rate (r_t) the function of inflation (π_t) and economic output (y_t), where π_t is the targeted inflation and the yp_t is the potential economic output:

$$r_t = \alpha(\pi_t - \pi_{t-1}) + \beta(y_t - y_{p,t}).$$

q. What is the autonomy of the monetary policy?

The autonomy of monetary policy can be described as a range of decisions for a central bank. The ability of central banks to set prime rates according to macroeconomic conditions and their independence from the monetary policies in the key currency areas. It is reduced by the degree of monetary interdependence, which is based on trade relationships and cross-border production chains. Global liquidity is able to limit this autonomy by increasing the vulnerabilities of a financial system through substantial mismatches across currencies, maturities and countries, while the supply of global liquidity stems from one or more “core countries”. (Plümper - Troeger 2008, Obstfeld et al. 2005)

r. What is the independence of monetary policy?

Monetary and fiscal policy should be separated from each other on an institutional level to maintain the CB's credibility in order to anchor inflation expectations. It can be described by the appointment of the governor (weak: by government, strong: by parliament; not in the cycles of parliamentary elections), relations with Government (Governor cannot hold government office, Government's approval not required in formulating monetary policy, the central bank sets the discount rate autonomously), monetary financing of public deficit is forbidden, the central bank required to pursue monetary stability among its primary objectives (Segalotto et al. 2006).

s. What are the functions of money?

A unit of account, a store of value, a medium of exchange and a standard of deferred payment. Inflation targeting can stabilize all of them.

Chapter II: Financial markets

This chapter summarizes financial markets as platforms of risk management and funding, defining each function and instrument.

1. Financial market structure

- Money market: for short-term borrowing (lending for less than 1 year).
- Capital markets:
 - Bond market is for long-term borrowing, bonds can be issued by governments, banks and companies.
 - Stock market: trading with shares – corporate ownership (for retail and institutional investors).
- Commodity market is for buying and selling raw materials (oil, iron, grain etc.).
- Currency market is to buy and sell currencies.

Assets are traded in real time on spot markets, payments are made immediately but delivery is delayed on futures and forward markets.

Financial markets can be used for asset financing (raise capital, refinancing operations), buying inputs or for risk management purposes.

a. How wire transfer for money works?

There are two kind of systems: the cheap, gross settlement systems and the more expensive real-time transfer mechanisms. Gross settlement systems are collecting orders until a specified time (like midnight or each 3rd hour in a day) in a bank-to-bank matrix, and then the excessive amount or money is transferred between the banks. There is no such buffering in real-time systems, however banks have to maintain more liquid assets to meet sudden and unknown customer needs. Card (debit or credit) payments are a bit different, because card company steps in as an intermediary between the client's bank and the company which sells the product or service. Foreign transfers are made through the SWIFT system, where each bank has its own identification code.

b. What is a clearing house?

Doing business on the financial market always has the risk of our partner going to default. This is why clearing houses were introduced in the 1930s, creating a third party to serve in

case of partner-default. Each participant shall maintain a deposit at the house as a collateral for their operations.

2. Risk management on financial markets

a. What kind of risks can affect an enterprise?

Risk is a calculable uncertainty in economics, represented by price-volatility or a probability of harm.

- Price changes: foreign exchange rates, raw materials, labour force;
- Changes of interest rates;
- Partner default (supplier, client);
- Country and political risks;
- Probability of harm.

b. What is a futures contract?

A futures contract is a standardized contract between two parties to buy or sell a specified asset of standardized quantity and quality for a price agreed upon today (the futures price) with delivery and payment occurring at a specified future date, the delivery date, making it a type of derivative instrument⁷.

c. What is an option contract?

It gives the buyer (the owner) the right but not the obligation to buy or sell an underlying asset or instrument at a specified strike price on or before a specified date. The seller has the corresponding obligation to fulfil the transaction – that is to sell or buy – if the buyer (owner) "exercises" the option. The buyer pays a premium to the seller for this right. An option which conveys to the owner the right to buy something at a specific price is referred to as a call; an option which conveys the right of the owner to sell something at a specific price is referred to as a put⁷.

⁷

http://chicagofed.org/digital_assets/publications/understanding_derivatives/understanding_derivatives_chapter_1_derivatives_overview.pdf

d. What is a swap-agreement?

When two counterparties exchange cash flows of one party's financial instrument for those of the other party's financial instrument.

Commodity swaps: a floating (or market or spot) price is exchanged for a fixed price over a specified period (crude oil).

Currency swaps: exchanging principal and fixed rate interest payments on a loan in one currency for principal and fixed rate interest payments on an equal loan in another currency.

Interest rate swaps: exchange of a fixed rate loan to a floating rate loan.

e. What is credit default swap (CDS)?

CDS is a financial swap agreement where the seller of the CDS will compensate the buyer (the creditor of the reference loan) in the event of a loan default (by the debtor) or other credit event. The buyer of the CDS makes a series of payments (the CDS "fee" or "spread") to the seller and, in exchange, receives a payoff if the loan defaults. There is a big difference between insurance and CDS: losses actually suffered in first case, but there is only a speculation on debt objects in the second case.

f. What is Securitization?

Securitization is the process in which certain types of assets are pooled so that they can be repackaged into interest-bearing securities. The interest and principal payments from the assets are passed through to the purchasers of the securities – an alternative and diversified source of finance based on the transfer of credit risk (and possibly also interest rate and currency risk) from issuers to investors. In step one, a bank (*originator*) with loans identifies the assets it wants to remove from its balance sheet and pools them into a reference portfolio. It then sells the asset pool to a special purpose vehicle (*SPV*)—an entity to purchase the assets and realize their off-balance-sheet treatment for legal and accounting purposes. In step two, the SPV finances the acquisition of the pooled assets by issuing tradable, interest-bearing securities that are sold to capital market investors. The investors receive fixed or floating rate payments from the cash flows generated by the reference portfolio. In most cases, the originator services the loans in the portfolio, collects payments from the original borrowers, and passes them on—after the deduction of the service-fee—directly to the SPV (Jobst 2008).

g. How FX rate influences corporate profitability?

Assuming an exporter company (a car manufacturer) that realizes its expenditures in domestic currency (like HUF) and its revenues in foreign currency (like EUR). Total expenditures are 100 million HUF, revenues are 0.5 million EUR and 1 EUR is 300 HUF so the profit will be $0.5 \cdot 300 - 100 = 50$ million HUF. A HUF appreciation (stronger HUF) would decrease profitability (for example, 1 EUR is now 250 HUF, so $0.5 \cdot 250 - 100 = 25$ million HUF), while depreciation (weaker HUF) would increase profitability.

Assuming an importer company (a mall) that realizes its expenditures in foreign currency (like EUR) and its revenues in domestic currency (like HUF). Total expenditures are 0.5 million EUR, revenues are 200 million HUF and 1 EUR is 300 HUF so the profit will be $200 - 0.5 \cdot 300 = 50$ million HUF. A HUF appreciation (stronger HUF) would increase the profitability (for example, 1 EUR is now 250 HUF, so $200 - 0.5 \cdot 250 = 75$ million HUF), while depreciation (weaker HUF) would decrease profitability.

It is necessary to identify FX sensible components in the profit and loss statement and in the corporate balance sheet to understand sensibility towards FX volatility. It is necessary to avoid currency mismatch: foreign FX-related assets should be financed from the same currency liabilities, expenditures in FX shall be paired with FX incomes.

h. How insurance companies are operating?

When an event can be approached from a probability point of view (with past data about the likelihood of the event) and it does not involve catastrophic outcomes (for example a mass flood destroys and entire city or region), then we can calculate the endangered value by multiplying the probability by the insured value. Living (probability of death of people, animal, plants) and non-living (buildings, vehicles, machinery etc.) entities can both be insured. It can be related to the harm or destruction of the subject or the mishap of the user (like colliding with our car into an another car).

Insurance is based on regular payments with the possibility of one single expenditure in case of emergency. The level of regular payments can be defined by the probability of harm and the value of the product, however, nobody knows exactly when the unwanted event might happen. This is why the portfolio is invested into government bonds – the most liquid and least risky assets on the market.

3. Asset financing

i. How can we acquire an asset?

An asset can be defined as processing capacity for n hours or m kilometres, with a defined lifespan – from a corporate perspective. As it gets older, maintenance expenditures increase and our profit is reduced by amortization as well. *Let us assume a price of 2 million EUR, maintenance is 0.5 million EUR in the first year, 1 million in the next one and so on, till it expires after 4 years (calculated amortization will be 0.5 million EUR/year).*

We can **buy it for cash** and use it until it is uneconomical to repair. *So our cash-flow looks like: $-2-(0.5+1+1.5+2)=-7$ million EUR, from accounting point of view it will be increased by amortization: $-2-(0.5+1+1.5+2)-4*0.5=-9$ million EUR.*

Rent or hire-strategy means that the asset does not appear in our books but we have to pay maintenance and rent (0.6 million EUR/year). *So our cash-flow looks like: $-(0.5+1+1.5+2)-4*0.6=-7.4$ million EUR and there is no amortization.*

We can **buy the asset with a loan** so we have to pay back the loan (4 year maturity) with an interest (10% interest rate) and we have amortization as well. *So our cash-flow looks like: $-(0.5+1+1.5+2)-4*0.5-(2+1.5+1+0.5)*0.1=-7.5$ million EUR, from accounting point of view it will be increased by amortization: $-(0.5+1+1.5+2)-4*0.5-(2+1.5+1+0.5)*0.1-4*0.5=-9.5$ million EUR.*

In case of a **financial lease**, the asset is purchased by a leasing company (lessor or owner) and given to the customer (lessee) with risks of ownership and fruits of benefits. The lessee gets depreciation each year on the asset and also deducts the interest expense component of the lease payment each year (0.7 million EUR/year). For the lessee, there is an option to purchase the asset at a "residual value" at the end of the lease term. The lease term can be defined as the function of maintenance fees: the leasing contract ends at the end of the first year and a new lease is made on a new asset in the next year. *So our cash-flow looks like: $-4*0.5-4*0.7=-4.8$ million EUR, from accounting point of view it will be increased by amortization: $-4*0.5-4*0.7-4*0.5=-6.8$ million EUR.*

j. What defines the interest rate for a corporate loan?

Key interest rate + bank liability interest rate premium + maturity, down payment + commission + partner risk, asset price volatility + additional services=corporate interest rate. Variable interest rate (like: “EURIBOR+2%”): at low interest rates, when market expects future increase. Fixed interest rate (like: “5%”): at high interest rates, it will be even more lucrative under decreasing interest rates.

Our interest rate will be higher in the following cases:

- a monetary tightening,
- it is harder for the bank to increase its liabilities,
- the maturity is longer,
- the down payment is lower,
- the commission is bigger,
- our probability for default is higher,
- the asset price fluctuates more than before,
- we are using some additional services.

k. What is the difference between a bank loan and a corporate bond?

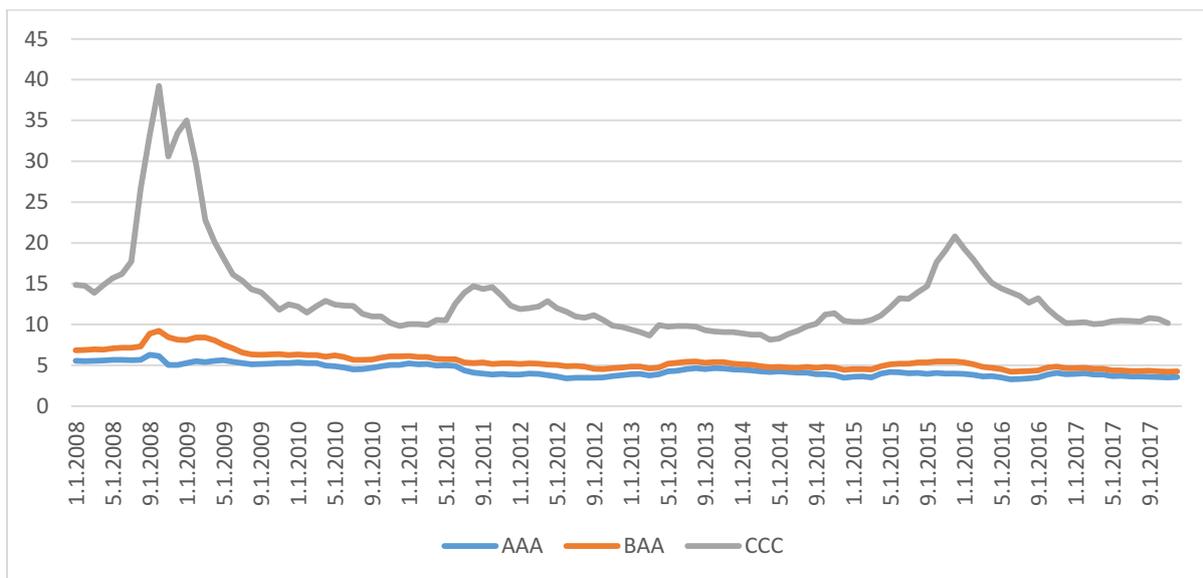
Both can finance a company. Bank loan: there is a debtor examination, the bank maintains close contact but is available under turbulent times. Corporate bond: company default is rated by rating agencies, there are atomized investors, high yields under turbulent times.

l. What is represented in the credit rating?

Credit rating represents the probability of default by classifying the debtor into different categories: “A” is high quality, “B” is mediocre, “C” is risky and “D” is under default. Banks are following clients’ credit history, monitoring how payments were made in time, the possible collateral, salaries, and geographical surroundings. Credit rating agencies (like Standard & Poor’s, Fitch, Moody’s) are focusing mainly on bonds (both corporate and government). Bond yield in different rating qualities are highly different in their level and volatility: higher risk causes higher yields and more sudden reaction on market sentiment changes (and liquidity shrinkage). Rating agencies were criticized during the 2008 crisis due

to the rapid down rating behaviour because they were inadequate to signal the actual risk of default for many securitized bonds.

Corporate bond rates with different ratings



Source: FRED database, <https://fred.stlouisfed.org/series>

m. Who are venture capitalists?

Angel Investors: single individuals, often entrepreneurs who enjoy helping out other small business owners. They do so by investing their personal wealth in a start-up business and seeking high rates of return for their monetary investment. Angel investors are also aware of the high risk that the investment entails.

VC firms: professional investment corporations raising money from private sources. They accept a lot more risk and will take a 30-50% ownership stake in the funded company, “strategic involvement” in decision making in the companies that they fund, focused on an end goal that will culminate in a “liquidity event.” Exit strategy that will insure that the investor(s) are paid out completely-most often through the sale of the company, not driven by transaction fees or quick returns, benefit all stakeholders with their success (Callahan – Muegge 2003). More than 95% of venture capital is invested into big enterprises and less than 5% is directed into start-ups.

n. What is an investment fund?

An investment fund is a supply of capital belonging to numerous investors that is used to collectively purchase securities while each investor retains ownership and control of his or her own shares. It provides a broader selection of investment opportunities, greater management expertise and usually lower investment fees.

The fund's investment-strategy can be oriented towards short and long term bonds (money market and bond funds), a mixture of different assets (portfolio) with active and passive asset management (they are changing portfolio elements according to market circumstances or they are following a strict rule to reduce trading activity), they are using spot markets only or forward and options market as well (structured funds). Open-end strategy means that investors can freely enter and exit from the fund – it requires excess liquidity maintenance and the performance will be influenced by short-term market mood. Closed-end strategy means that fund accepts investments only at the beginning, and exit is possibly only at expiration – therefore fund managers are less influenced by market developments but require higher trust from investors. Hedge funds are operating with various financial innovations with poor financial supervision. Exchange traded funds (ETF) are traded on stock markets. Buy-and-hold strategy focuses on the accumulation of profitable companies with remarkable cash-producing capabilities and has a long term perspective.

o. What is a Sovereign Wealth Fund (SWF)?

SWFs are public investment agencies which manage part of the (foreign) assets of national states. They can apply the following strategies:

- stabilization funds where the primary objective is to insulate the budget and the economy against commodity (usually oil) price swings;
- savings funds for future generations which aim to convert non-renewable assets into a more diversified portfolio of assets and mitigate the effects of Dutch disease;
- reserve investment corporations whose assets are often still counted as reserve assets and are established to increase the return on reserves;
- development funds which typically help fund socio-economic projects or promote industrial policies that might raise a country's potential output growth;

- contingent pension reserve funds, which provide (from sources other than individual pension contributions) for contingent unspecified pension liabilities on the government's balance sheet.

They are created by resource-rich economies which currently benefit from high oil and commodity prices to serve the purpose of stabilising government and export revenues which would otherwise mirror the volatility of oil and commodity prices. It is also made by Asian countries where reserves are being accumulated in excess of what may be needed for intervention or balance-of-payment purposes. These countries are mostly not linked to primary commodities but rather related to the management of inflexible exchange rate regimes. They have explicit return objectives and may invest in more risky assets than central banks. (Beck – Fidora 2008)

Chapter III: Public finance

To understand public finance, it is necessary to define the actual functions of the state. There is no clear and optimal portfolio: it depends on the exact country, time period and it is highly imbedded to the socio-economic background and the common preferences. Preferred functions are defining expenditures which must be covered by tax incomes. The difference between the two sides of the budget is the deficit and which must be covered by government bond issuance. Government bonds are playing a significant role on the financial system as the asset with the lowest risk. However, countries can face the consequences of excessive spending in the long run by increased yields, inadequate funding by capital flight or a sudden stop. A public default is the worst case scenario for each actor inside and the economy.

1. State functions are defined by the underlying economic model

A short list of possible state functions were created by Fukuyama (2004) defining actions to achieve market corrections and preferences about public property. The level of state importance can vary on a time-to-time basis and by country. States at least shall maintain some level of public order and defence and provide some kind of risk assessment features to be considered more than a circled territory on the map with a name on it. Industrial revolutions created an increasing need for educated workforce – and to keep the value of this investment in the human capital healthcare and pension systems were developed with the need of managing economic mishaps as well. However, it is still arguable, on which level the state must interfere with the economy: as a sole regulator, as a developer, as an owner or as an ultimate source of all decisions?

	Market corrections	Property
Minimalist	Public goods	Protecting the poor
	Defence	Managing catastrophes
	Public order	
	Property rights	
	Macro policies	
	Public healthcare	
Interim functions	Education	Social security
	Competition law	- Healthcare

	Financial supervision	- Pension system
	Consumer rights	- Unemployment benefits
Activist functions	Market regulation	Redistribution
	Investment support	
Totalitarian functions	Planned economy	Nationalized properties
	Human resource is a tool of production	
	Centralisation	

Source: Fukuyama (2004)

Varieties of capitalism try to describe and structure socio-economic fundamental differences among countries, affecting product and labour markets, financial sectors, social protection or education system.

	Liberal market economy (U.S., U.K., Canada, Australia, New Zealand, Ireland)	Coordinated market economy (Germany, Japan, Sweden, Austria)
Mechanism	Competitive market arrangements	Non-market relations
Equilibrium	Demand/supply and Hierarchy	Strategic interaction among firms and other actors
Inter-firm relations	Competitive	Collaborative
Mode of Production	Direct product competition	Differentiated, niche production
Legal system	Complete and formal contracting	Incomplete and informal contracting
Institutions' function	Competitiveness, Freer movement of inputs	Monitoring, Sanctioning of defectors
Employment	Full-time, General skill, Short term, Fluid	Shorter hours, Specific skill, Long term, Immobile
Wage bargain	Firm level	Industry level
Training and Education	Formal education from high schools and colleges	Apprenticeship imparting industry-specific skills
Unionization Rate	Low	High
Income Distribution	Unequal (high Gini)	Equal (low Gini)
Innovation	Radical	Incremental
Comparative Advantage	High-tech and service	Manufacturing
Policies	Deregulation, anti-trust, tax-break	Encourages information sharing and collaboration of firms

a. How government budget is structured?

Budget has two sides: revenues and expenditures. Revenues are standing from tax, duty, fee and dividend (from state-owned enterprises).

- Consumption taxes (citizens)
 - Value added tax (VAT): they must be paid by every citizen, regardless their income, age or social status. Inflation increases this income.
- Payroll tax (employees): overall employment and wage level can affect these incomes (as well as the size of unregistered black employment).

- Redistribution – progressive: the higher the salary, the bigger the tax ratio. This is why rich people prefer to optimize their taxation by tax havens or by charity funds.
- Flat: same tax ratio for each income without opportunities to reduce tax payments.
- Income tax (companies): it can be affected by corporate profitability. However, governments are building in incentives for investments and there are other legit (and less legit) ways to reduce the amount of this tax, that is why it has the lowest significance.
- Other taxes (owners)
 - Capital gains tax
 - Wealth tax
 - Gift tax

Expenditures are always defined by state functions

- government consumption: spending on current goods and services
- government investment: human and physical capital investment or research
- transfer payments:
 - unemployment
 - retirement benefits
- debt service: interest payments must be covered by tax incomes, otherwise the country will fall into a deadly spiral of indebtedness.

Budget deficit: the difference between incomes and expenditures.

b. How budget deficit and public debt are created?

Budget deficit is the difference between expenditures and revenues (as a percentage of GDP). It can be revenue based – due to overestimated consumption, employment, economic activity or as a result of an economic shock. It can be expenditure based as well – lack of budgetary discipline, catastrophes, economic activism.

The amount of new government bonds to be sold on the market is defined by expiring government bonds and actual budget deficit. Interest after government bonds shall be paid

from public budget (debt service). With longer maturities (10Y-20Y) yearly debt renewal can be reduced. High inflation: interest increases, market price decreases – the state can collect less money at higher costs. The central bank can buy second hand government bonds only at the secondary markets (direct financing is prohibited).

Main investors are:

- banks (to put some % of depositor's money into safe and easy access investments),
- insurance companies (insurance fees are invested to gov. bonds, because they have to pay right after damage),
- investment funds, pension funds (liquid and safe investment)
- Households

The debts of state owned enterprises are financed by the banking sector but from a statistical point of view this is considered as a part of public debt.

c. What is public default? How it is related to bank crisis?

The state as debtor is not able to pay back the expiring debt – because it is not able to sell new government bonds at a reasonable price (par value-market price+interest rate=yield is too high). The probability of default is not related to debt-to-GDP level, it is related to the ability to SELL the government bond! Domestic sale is always easier than the combination of domestic and foreign sales – but the latter is necessary when domestic savings are not enough... Debt rescheduling: expiring government bonds are transformed to long maturity government bonds. Debt reduction, forgiveness: some % of existing government bonds are transformed to new government bonds with a 40-50% discount. Domestic banks, insurance companies, investment funds etc. are losing their assets as well – reduces household savings and overall confidence in the financial system.

Organisations related to public defaults:

- Paris Club: sovereign lenders (countries) and debtors can negotiate here.
- London Club: private lenders and sovereign debtors can negotiate here – if there is someone to represent private lenders (they are not too atomized).

- IMF lending programs: refinancing public debt for several years until public budget is consolidated.

An economic crisis can result in mass bankruptcy (companies, households), leading to questionable repayment of bank loans, requesting bank consolidation.

- By merger (bad bank + good bank = mediocre bank).
- By debt: bank assets: bad loans purchased for new government bonds but public debt increases and the state is not able to meet its current refinancing requirements, so public debt shall be prolonged or restructured.
- Banks are not able to renew their resources but central bank provides loans instead of market lending.

d. What kinds of models are available to make a pension system?

Multi-pillar Pension Systems by the World Bank

- 0. pillar: flat retirement benefits
 - any social contribution payment during lifespan □ a minimal pension income to survive
- 1. pillar: Pay-as-you-go (PAYG)
 - Social contribution payments □ retirement benefit expenditures (flow without stockpiling of capital)
 - Surplus: additional budget income
 - Deficit: additional budget expenditure
- 2. pillar: mandatory funded
 - Individual savings accounts, managed by asset managers
 - Private vs public asset managers, portfolio structure, fees, no state guarantee on payments
- 3. pillar: volunteer funded
 - Individual savings accounts, managed by private asset managers
- 4. pillar: individuals savings, family

Chapter IV: Lessons from the past

This chapter is about what we can learn about economic structures, the financial sector, institutions and trade relations from the experiences of late-antiquity and medieval periods. Although both periods are considered remarkably alien in their political and social structures compared to modern economies, they can still provide useful knowledge about the general rules of how the economy is the subject of the underlying society and vice versa.⁸

1. Resilience

Late-antiquity covers the transitional period of the Roman Empire from a continental-wide, integrated, urbanized, monetized economy with a strong central power to an atomized patchwork of barbaric kingdoms losing long-distance relations with each other, halving the Empire's population and turning them back to a rural society within a single generation. Medieval economy was based on the agricultural revolution of the 1100s combined with a still fragmented power structure, thriving trade relations and the emergence of holding companies and re-urbanization.

a. Do plagues and climatic changes have catastrophic economic consequences?

The late Roman period was characterized by many disastrous events: shrinking tax incomes, dissolving military power, reduced consumption and trade. However, the Roman Empire was always able to turn the tide in the past when it came to barbaric invasions or domestic insurgency. Despite the fact that the western empire lost its most important taxpayer province (Africa with Carthage, nowadays Tunisia), or the local elite turned its back to the marginalized court in Ravenna by serving the new barbaric kingdoms, the mayor cities were still intact and trade and consumption were still continent-wide in the Mediterranean⁹. The Justinian bubonic plague in 540 combined with the end of the Roman climatic optimum¹⁰ in the fifth century cut down the population and put an end to deeper division of labour or further urbanisation for the next five centuries. So we can say that both the plague and the changing climate had catastrophic impact on the people and the economy in this period –

⁸ recommended hearing: <https://deadspin.com/climate-plague-and-the-fall-of-the-roman-empire-1822315385>

⁹ Poorer territories like British island collapsed instantly right after the roman legions left because of the lack of the consumption made by the military, meanwhile key population centres like Rome or cities in modern southern France were losing some percent of their population only.

¹⁰ Warm summers, moderate winters for centuries.

especially because all other institutions had already been in the state of collapse in the last century.

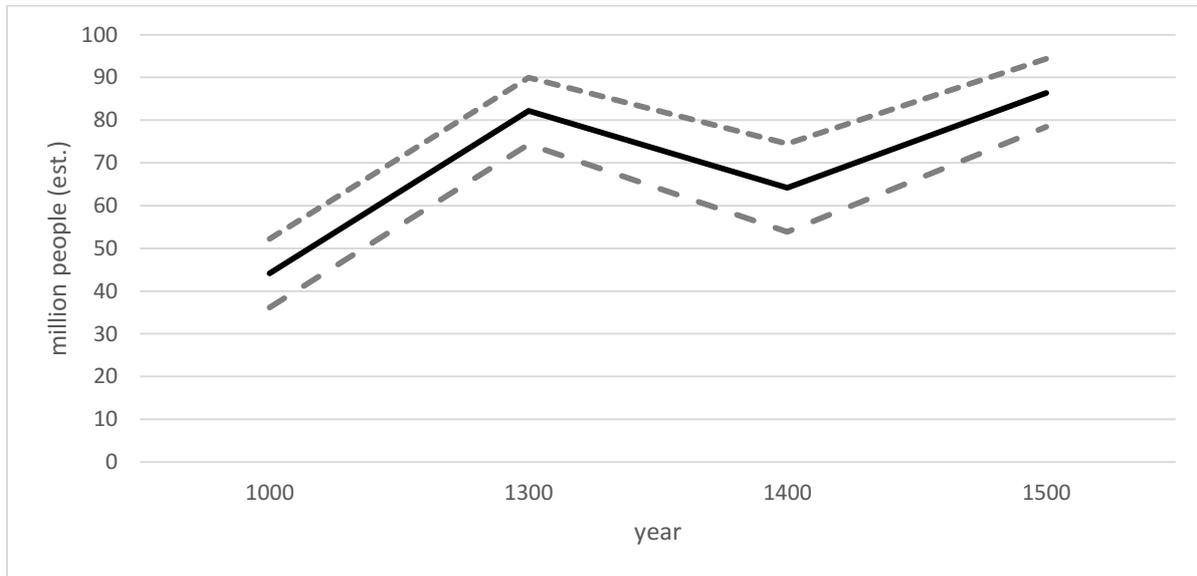
Bubonic plague and climate change stroke again in the 1200s with a result of dramatic population loss in medieval Europe. This, however, was not followed by an economic demise mostly due to the lack of central political power (people had much the same commitment towards their city council or regional aristocracy, to the church and to their kings as well). Economic relations were driven solely by private consumption both in rural and urbanized areas, Paris being the biggest city during the 1200s with a population of 100,000. The plague made people shift towards lower margins in trade and it provided an incentive to improve efficiency both in production and in agriculture.

b. Why crop-yield matters so much?

Agricultural yields had huge differences on the Globe until the 1600s mostly determined by the key crops produced in specific areas. 1 seed of wheat provided 8 new seeds in medieval Europe, while rice provided 20 in China as well as corn yielded 30 in Central America at this time according to Fernand Braudel (1979). Obviously this had a significant impact on the shock-resilience, structures and motivations of these societies. Europe in the Middle Ages (even until the middle 1600s) had struggled with famine constantly, population density was relatively low and even the not so welcoming mountainous areas had to be cultivated or at least used for pasturage to raise cattle, sheep and other livestock. Maintaining a small town of only several thousand people required huge farmlands in the neighbouring areas.

European¹¹ Population Estimates (in millions) at specified times, 1000-1500

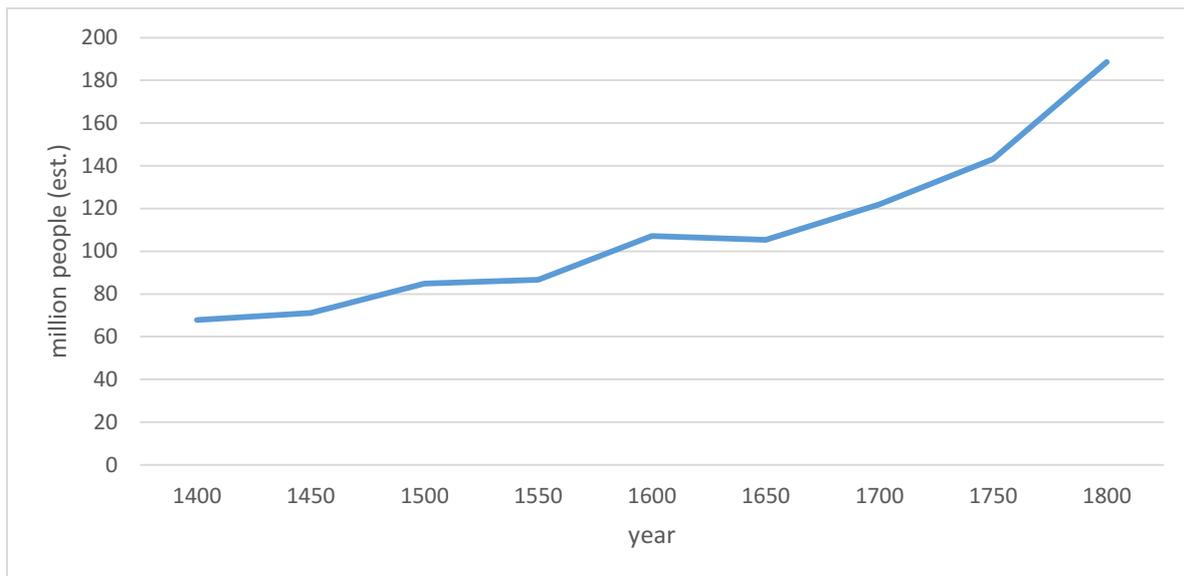
¹¹ Chinese population stagnated around 110 million people between 1200-1600, see: http://www.china-profile.com/data/fig_pop_0-2050.htm



Source: Malanima (2010)

Intense agriculture in the Netherlands allowed a higher than 50% ratio of urban population in the 1500s only. Apart from this, the widespread cultivation of potato, corn, rice and the application of crop rotation allowed further growth of the European population in the pre-industrial revolution (and pre-antibiotics) period.

European¹² Population Estimates (in millions) at specified times, 1400-1800



¹² Chinese population tripled until 1800 compared to 1650, see: http://www.china-profile.com/data/fig_pop_0-2050.htm

Source: Malanima (2010-2011)

Low grain-yields and poor cultivation provided an upper cap for population growth in Europe until the discovery of the Americas in the 1500s limiting consumption and overall economic potential as well.

c. How the state was re-invented?

The Roman Empire was based on a precise administration that maintained infrastructure and the army, making even the trade of mass-consumption products like pottery or fish sauce continent-wide¹³. This is why the political collapse of the central power and the financial problems made the “usual” barbaric invasions and insurgencies fatal at this time causing regional isolation everywhere in the western empire. Barbaric kingdoms inherited a declining economy (focusing on self-sustainability at most) and population (climate, plague, wars etc.). As a result, the actual power of the king depended on the sheer size of his lands to keep the parity with the aristocracy (the loss of this parity could mean the end of a dynasty like in the case of the Merovingians in the Frankish Empire of the late 700s or the Árpád-dynasty of the late 1200s in Hungary).

The agricultural revolution of the 1200s provided goods to be sold on local markets making the economies monetized again. Kings and members of the aristocracy could collect their income in coins instead of grain or animals while cities and their free population (subjected solely to the king, not to local aristocrats) became more and more important as tax payers. However, it took four centuries from the beginning of the agricultural revolution until the stabilization of the absolute monarchies to make states rely on their tax incomes instead of the private property of their kings. Tax incomes provided the benefits of upkeeping professional administrators (instead of the church and significant aristocrats) and the army (instead of aristocratic knights with at least questionable skills and motivation to fight).

2. Financial concepts

Are financial concepts like bonds, interest or holding companies burdens of modernism or an imbedded feature of society?

¹³ Pottery from Cartage can be found even in the poorest provinces like on the British island.

d. Is it adequate to talk about the ethics of interest payment?

Interest payment had many different conceptualizations and approaches over the ages both pro and contra. However, we know that it is somehow related to the risk of repayment, inflation, elapsed time and alternative investments. The question remains: is there any kind of a project that can be done in a non-growing or even declining and hazardous economy? We assume the answer to be highly unlikely. People living between the fall of the Western Roman Empire and the agricultural revolution of the 1100s had to survive under a six century long economic depression. Wars, famine and violence were common both before and after this period but the division of labour or trade completely disappeared from the western hemisphere at this time.

Due to the food surplus created by the agricultural revolution of the 1100s a narrow band of urban population became sustainable, while economy and tax payment monetized again. Consumption concentrated in the cities like Paris (with 100,000 inhabitants) with funded intra-continental trade routes to support them. By having the actual goods and a “widespread” demand for them again after 600 years, trade enterprises were formed to serve these needs. This relative growth in the economy was enough to diminish any further questions about lending – due to the numerous and prosperous business opportunities.

e. What motivated the issuance of the earliest bonds?

The first “government” bond was issued by the Italian city of Florence in the 1200s to finance road building works around the city. The bond was covered by the future incomes from road-tolls and paid a 5% interest. The concept of publicly organized long-term project with the intention of economic development is quite clear in the case.

f. How holding companies were created?

At this time European trade was executed by merchant holding companies with branches everywhere in the continent. The Mediterranean Sea (or “Levant”) was dominated by Italian city states like Venice, Geneva, Pisa, as well as by other cities like Barcelona, Valencia, Naples, Ragusa (Dubrovnik) or Constantinople (Istanbul). On the one hand, this market was responsible for the import of luxuries from India or China¹⁴ (like silk, spices etc.) where they

¹⁴ The share of the European export was around 5% of the Indian trade, so it was highly marginal compared to the vast wealth of the domestic market at the time.

had no counter product, so they had to pay with silver or gold for it (creating a long-term drain of precious metals at the continent). On the other hand, soap and glass was imported from Damascus and Aleppo (Syria) with the cities later initiating the production of these products next to fine clothing and expensive weapons and armours. The region of the Northern and the Baltic Sea was dominated by the cities in the Hanseatic League connecting London, Brügge, Köln, Hamburg, Lübeck, Danzig, Riga with Novgorod and the Nordic territories. It focused much more on the production and distribution of consumer goods and raw materials like wool, textiles (woollen and linen fabrics,), beer, grain, tar, metals.

Medieval Trade Routes and Trade Fairs



Source: http://wps.pearsoncustom.com/wps/media/objects/2426/2484749/chap_assets/maps/atl_map8_2.html

The entire network was based on correspondence, although delivering a letter from Paris to northern Italy required a month on land with sea transportation being significantly faster (a ship could sail from Constantinople to Venice in roughly 15 days). This was not without consequences: in order to be able to operate local branches had to have higher independence and financial autonomy. On the other hand, personal connections (networking) and writing skills were crucial in business and was able to maintain a distinct administrative working class in cities with an increasing demand for education and rhetoric skills (also explaining the huge

interest in antique authors like Cicero, Ovidius etc.). Business enterprises were connected mostly to the merchant, accounting and double entry book keeping were created shortly to maintain and supervise business operations.

g. How commercial banking was created?

The concept of modern commercial banks (institutions collecting short-term deposits and providing long-term loans bearing all the risks of lending) is not so old: it is mostly the product of the 20th century. Medieval banks provided services like exchanging currencies and only some of them collected deposits for future lending. The city of Florence in Northern-Italy was quite a late-comer as it had no ports (like Venice or Geneva) or other special resources. However, on the basis of personal trade networks the city suddenly became a key financial centre for the whole of Europe. At the same time, lending to sovereigns until the appearance of absolute monarchies in the 1500s was highly dangerous with public defaults remaining quite common later as well.

Commercial banks also worked as trade-credit providers: a merchant issued a debt certificate with a collateral of an underlying cargo or stock of goods with a defined time of payment. If the other merchant had no intention to wait until this time, he was able to sell this commercial paper to another merchant or to the bank with some discount in the price (a compensation for the risk). When two ports maintained a strong relationship with each other it was easier for merchants to settle business relations with such commercial papers instead of transporting gold or silver (with military support needed as well).

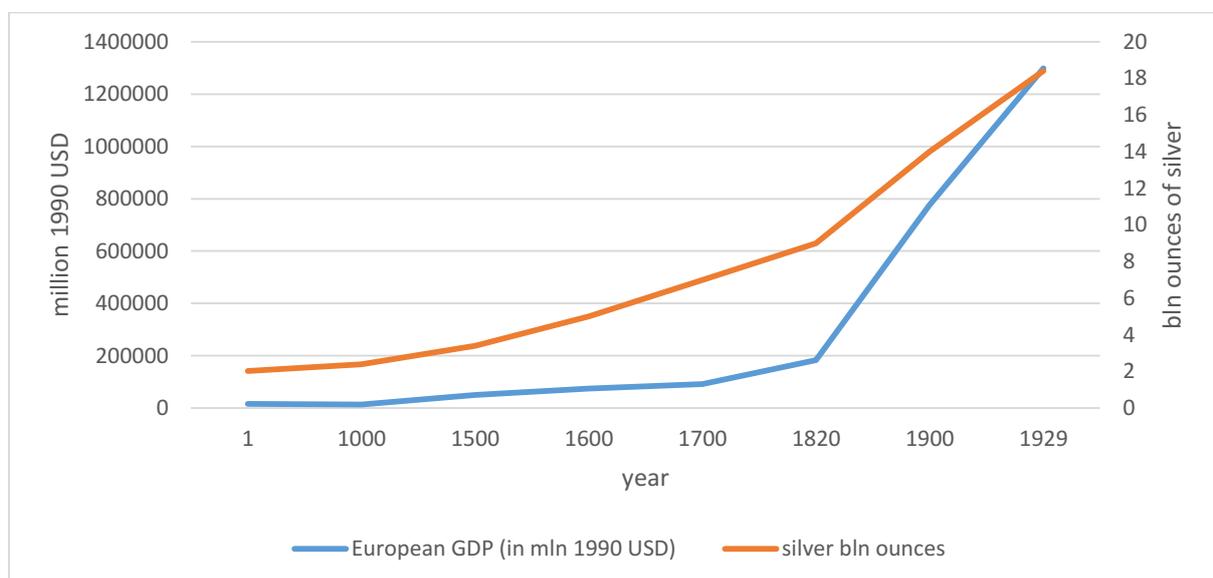
Therefore we can say that the medieval heritage is maintained mostly by investment banks (Anglo-Saxon terminology) or investment funds (continental terminology).

h. Why don't we use gold again?

Gold had been used as a collateral behind money since the beginning of time (or when people first realized that bartering was not a good idea) until 1973 (at least for the US dollar). However, there was a problem with the harmonisation of money demand and gold supply: when the economy grows the demand for money grows as well. Even the first commercial papers were introduced with money functions (payment, lending) in medieval times due to the difficulties of gold payments. The introduction of bank notes (backed by gold reserves in the commercial bank) bypassed most of these issues in the early 1800s but the gold-to-money

ratio decreased steadily during the entire 19th century. Under the great depression of 1929-1933 economic actors turned to gold-backed money instead of further consumption or investment because they were afraid of losing even more money. This was the reason behind governments (like US president Franklin D. Roosevelt) suspending gold convertibility in order to push actors out from their safe (and overly conservative) positions. This is highly similar to the enormous bond purchase actions of the US FED, the Japanese Central Bank or the European Central Bank in the 2010s, when they shrivelled investors out to motivate them to hold riskier assets.

Unfortunately there is no historical data about gold in circulation, however, there are good estimations for silver¹⁵. In this case we can see how the gap opened between the available quantity of precious metals and the GDP since the late antiquities. Only the mining boom in Latin-Americas closed this gap after 1870, causing a sudden fall in silver prices.



Source: Angus Maddison database and David Zurbuchen

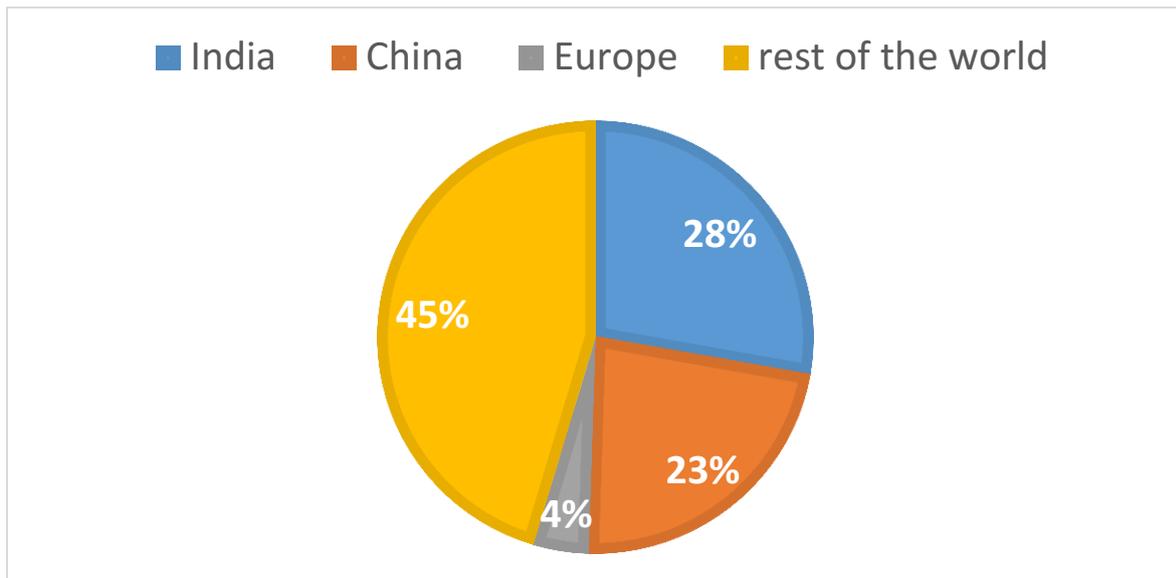
i. How about emerging countries like China or India?

From a historical standpoint Europe or the Americas could be considered “emerging” regions on the Globe. Western Europe only started taking over in the mid-1800s until the USA took

¹⁵ David Zurbuchen (2006): The World's Cumulative Gold and Silver Production. <http://www.gold-eagle.com/article/worlds-cumulative-gold-and-silver-production>

the lead after the First World War in aggregate GDP. Developed countries still have a lead in GDP per capita ratios.

Share of world GDP in 1000AD



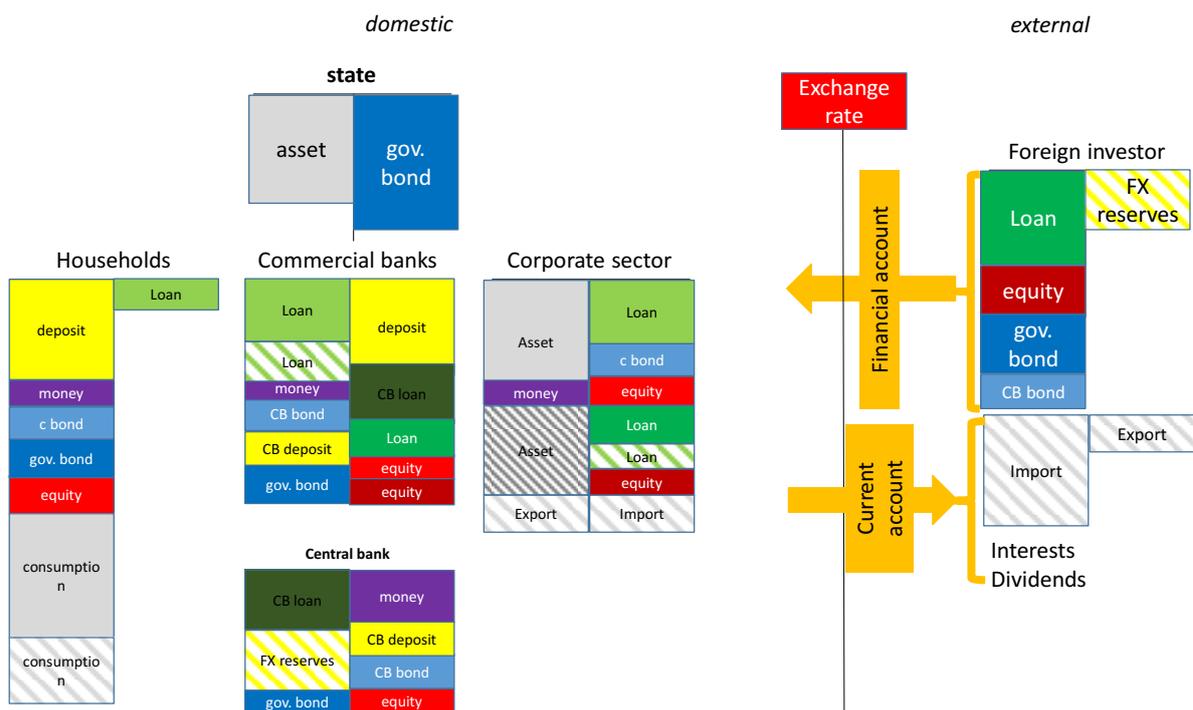
Source: Angus Maddison database, <http://www.ggdc.net/maddison/oriindex.htm>

Chapter V: Interactions among economic actors

Financial intermediaries serve as a channel in savings to the economy. Households and foreign investors are usually considered as the source of savings while the corporate sector and the state utilizes these funds for long-term benefits. Commercial banks are responsible for maturity transformation (converting short-term savings to long-term loans) and risk management (depositors are not bearing the risk of lending). Central banks have mixed responsibilities: they are responsible for the maintenance of the internal and external purchasing power of the currency and they supervise the financial sector.

1. Financial relationships among economic actors

Upper relations can be visualized by sectorial balance sheet relations among the actors, referring as a zero sum game on the process of the creation and utilization of the capital.



a. *Why is it important to maintain the trust of households in the financial system?*

Households can utilize their income in two ways: they can spend their income quickly or they can save or invest it in hope of higher future consumption. These preferences can be affected by past experiences, expectations about the future, demographics, overall lifestyle and social beliefs. Surplus incomes can be invested directly into domestic and foreign companies by

purchasing equities (to become owners with an influence on corporate strategy to pursue future profitability) or corporate bonds (to become lenders, to collect interest payments and the invested capital at expiration). Direct investment requires some specific knowledge about the enterprise and risk bearing while households can utilize the banking system as well by keeping their savings in bank deposits. In this case, the depositors' money will be aggregated and lent out to companies, other households or even the state itself with the depositor bearing no lending risk at all: all the losses on non-performing loans will be absorbed by the bank's equity. Commercial banks are special due to their ability to aggregate individual savings and this is why they are hazardous as well. States are able to define taxes so they are the most secure debtors in each economy. This is why the yield of short term government bonds (a.k.a. treasury bills) is similar to the interest of bank deposits.

Households can be alienated from saving behaviour by corporate scandals (falsified reports, bond defaults), by bank defaults (no bank can withstand a bank run – a mass removal of deposits when clients are afraid that their savings can be buried by the avalanche of non-performing loans and inadequate capital) or by public default (resulting in instantaneous losses for government bond holders and default of banks, insurance companies and investment funds are key holders of these bonds) or by reduced purchasing power due to inflation and currency depreciation.

b. Why is it important to use foreign investor capital?

Foreign investors can step in for two occasions: there is a scarcity of domestic capital providing a premium for investments (higher interest rates and returns) or the country is considered a safe haven where the inflation rate is low and the financial system is sound (with a lack of trust in their own financial system).

A foreign investors' capital can extend the abilities of domestic funding making sectorial balance sheets and asset accumulation bigger. The question is the foreign investors' response to global recessions. As long as the interest premium is big enough they can stay, however, it will be harder and harder to renew expiring debt and the central bank will be unable to do any kind of economic stimulus like cutting interest rates. They may have to liquidate their assets in the given country as well to cover their losses elsewhere. The sudden decline of foreign funding can be referred to as a "sudden stop", while a panic-driven fire-sale event is called a

“herding”. Safe haven economies are experiencing the opposite at these times: there is a rapid and intense hunger for their currency, bonds and other assets – making close-to-zero interest rates and yields and currency appreciation (like it happened with the Swiss Franc in the 1970s and in the 2010s). It can be also dangerous because an appreciating currency can kill exporting companies (they are not able to compensate with increased productivity so sudden) and can create excessive amounts of money with the possibility of future inflation when foreign investors are going home.

c. Why do we need central banks?

Central banks have two purposes: to maintain financial stability and the value of money. Money value can be defined by inflation and exchange rates, both referring to the available products and services in the economy and the demand for them as well as the way of their funding. Inflation can be created by excessive demand (both by households or the state) and surplus of funding (bubble). Meanwhile, productivity growth can be responsible for declining prices as well. However, there is a huge difference between a technology-driven deflation period (like during the 1800s due to the industrial revolutions) and the state of collapsed demand and funding (like in the 1930s and in 2008-2010). A reasonably low inflation can be achieved by central banks by fine-tuned lending channels, making interest rates a preferred instrument. Large-scale lending to commercial banks or bond purchases (government bonds can be purchased on the second hand – more precisely secondary markets – only!) are signs of a dysfunctional financial sector where investors can be calmed and motivated by funding by the appearance of a stable buyer like the central bank only.

Financial stability is considered as the combination of micro- and macroprudential policies: on a micro level commercial banks are supervised to meet their legal obligations while on a macro level the financial system as a whole is analysed from the point of view of stability. Huge international bank chains need special attention because of their higher likelihood of contagions and bigger balance sheets.

Liquidity management of the banking system is also important, central banks are accepting (or requiring) deposits from commercial banks and providing loans (with adequate collateral) to them. The amount of capital and the level of interest rate is a clear sign of their intentions.

d. What is represented by the exchange rate?

Changes of the exchange rate can be motivated both by economic and political factors. Political factors are represented by preferences of the central bank (to manage inflation or under fixed exchange rate regimes) or by economic policy to achieve stimulus through the increased export-competitiveness (without any improvement in productivity). Economic factors are way more long-term and generally driven by the external balance of the economy: are they able to produce and sell goods and services on the global market? Are they able to convert imported resources (like goods, services and capital) to higher value products for foreign buyers?

On the other hand, the exchange rate also responds to the demand and supply of foreign investors' capital while future rates are indicating market sentiment about expectations. In most cases, this can be captured in the difference between foreign and domestic real interest rates (nominal interest rates minus inflation).

At the end of the day, regardless the fundamentals, the actual supply and demand will define the exchange rate on the spot market.

Glossary¹⁶

- **Asset:** A resource controlled by an enterprise as a result of past events and from which future economic benefits are expected to flow to the enterprise.
- **Base money (monetary base):** Currency (banknotes and coins) in circulation plus the minimum reserves credit institutions are required to hold as deposit in the central bank and any excess reserves they may voluntarily hold.
- **Bill of exchange:** A written order from one party (the drawer) to another (the drawee) instructing it to pay a specified sum on demand or on a specified date to the drawer or a third party specified by the drawer. These are widely used to finance trade and to obtain credit when discounted with a financial institution.
- **Bond market:** The market for interest-bearing securities (with either a fixed or a floating rate and with a maturity of at least one year) that companies and governments issue to raise capital for investment. Fixed-rate bonds account for the largest share of this market.
- **Central bank:** An institution which – by way of a legal act – has been given responsibility for conducting the monetary policy for a specific area.
- **Central bank credit facility:** A standing credit facility which can be drawn upon by certain designated account holders (e.g. banks) at a central bank. The facility can be used automatically at the initiative of the account holder. The loans typically take the form of either advances or overdrafts on an account holder's current account which may be secured by a pledge of securities or by repurchase agreements.
- **Clearing:** The process of transmitting, reconciling and in some cases confirming transfer orders prior to settlement, potentially including the netting of orders and the establishment of final positions for settlement. Sometimes this term is also used (imprecisely) to cover settlement. For the clearing of futures and options, this term also refers to the daily balancing of profits and losses and the daily calculation of collateral requirements.
- **Collateral:** An asset or third-party commitment that is used by a collateral provider to secure an obligation vis-à-vis a collateral taker.

¹⁶ Based on: <https://www.ecb.europa.eu/home/glossary/html/glossa.en.html>

- Consumer credit: Loans granted to households for personal use in the consumption of goods and services.
- Consumer price index (CPI): A measure of changes over time in prices of consumption goods and services acquired or used by households.
- Cost of the external financing of non-financial corporations: The cost incurred by non-financial corporations when taking up new external funds. The cost of bank lending, the cost of debt securities and the cost of equity.
- Counterparty: The opposite party in a financial transaction (e.g. any party transacting with a central bank).
- Counterparty risk: The risk that between the time a transaction is agreed and the time it is actually settled the counterparty to that transaction will fail to fulfil its obligations.
- Credit card (card with a credit function): A card that enables cardholders to make purchases and/or withdraw cash up to a prearranged credit limit. The credit granted may be either settled in full by the end of a specified period or settled in parts with the balance taken as extended credit (on which interest is usually charged).
- Credit institution: Any institution whose business is to receive deposits or other repayable funds from the public and to grant credit for its own account or which issues means of payment in the form of electronic money.
- Credit risk: The risk that a counterparty will not settle the full value of an obligation – neither when it becomes due, nor at any time thereafter.
- Cross-currency swap: A contractual agreement with a counterparty to exchange cash flows representing streams of periodic interest payments in two different currencies.
- Currency in circulation: Banknotes and coins in circulation that are commonly used to make payments.
- Custody: The holding and administration by an entity entrusted with such tasks, of securities and other financial instruments owned by a third party.
- Debt: Loans, deposit liabilities, debt securities issued.
- Debt security: A negotiable financial instrument serving as evidence of a promise on the part of the issuer (the borrower) to make one or more payment(s) to the holder (the lender) on a specified future date or dates. Such securities usually carry a specific rate of interest (the coupon) and/or are sold at a discount to the amount that will be repaid

at maturity. Debt securities issued with an original maturity of more than one year are classified as long-term.

- Debt service: The set of payments including the principal amount and interest to be made by the debtor over the life of a debt. Debt service can be measured for past periods (observed) or future periods (scheduled). The most common period selected for debt service is the coming year.
- Default: An event stipulated in an agreement as constituting a default. Generally, such events relate to a failure to complete a transfer of funds or securities in accordance with the terms and rules of the system in question. A failure to pay or deliver on the due date, a breach of agreement and the opening of insolvency proceedings all constitute such events.
- Deflation: A decline in the general price level, e.g. in the consumer price index.
- Degree of openness: A measure of the extent to which an economy depends on trade with other countries or regions, e.g. the ratio of the sum of total imports and exports to GDP.
- Dematerialisation: The elimination of physical certificates or documents of title indicating ownership of financial assets, such that the financial assets exist only as accounting records.
- Derivative: A financial contract whose value depends on the value of one or more underlying reference assets, rates or indices, on a measure of economic value or on factual events.
- Discount: The difference between the par value of a security and its price when such price is lower than par.
- Effective exchange rate (EER): A weighted average of bilateral Euro exchange rates against the currencies of the country's main trading partners. The weights used reflect the share of each partner country in the country's trade in manufactured goods and account for competition in third markets.
- Equity: All instruments and records acknowledging claims on the residual value of a corporation after the claims of all creditors have been met.
- Euro interbank offered rate (EURIBOR): The rate at which a prime bank is willing to lend funds in Euro to another prime bank. The EURIBOR is calculated daily for

interbank deposits with a maturity of one week and one to 12 months as the average of the daily offer rates of a representative panel of prime banks rounded to three decimal places.

- Exchange rate targeting: A monetary policy strategy aiming for a given (usually a stable or even fixed) exchange rate against another currency or group of currencies.
- Exposure: The loss that would be incurred if a certain risk materialised.
- Financial asset: Any asset that is (i) cash; or (ii) a contractual right to receive cash or another financial instrument from another enterprise; or (iii) a contractual right to exchange financial instruments with another enterprise under conditions that are potentially favourable; or (iv) an equity instrument of another enterprise.
- Financial intermediary: A commercial entity that serves as an interface between lenders and borrowers, e.g. by collecting deposits from the general public and extending loans to households and businesses.
- Fixed rate instrument: A financial instrument for which the coupon is fixed throughout the life of the instrument.
- Floating rate instrument: A financial instrument for which the coupon is periodically reset relative to a reference index to reflect changes in short or medium-term market interest rates. Floating rate instruments have either pre-fixed coupons or post-fixed coupons.
- Futures contract: A contract to buy or sell securities or a commodity at a predetermined price on a specified future date.
- Haircut: A risk control measure applied to underlying assets whereby the value of those underlying assets is calculated as the market value of the assets reduced by a certain percentage (the “haircut”). Haircuts are applied by a collateral taker in order to protect itself from losses resulting from declines in the market value of a security in the event that it needs to liquidate that collateral.
- Inflation: An increase in the general price level, e.g. in the consumer price index.
- Inflation risk premium: Compensation of investors for the risks associated with holding assets (denominated in nominal terms) over the longer term.

- Inflation targeting: A monetary policy strategy aimed at maintaining price stability by focusing on deviations in published inflation forecasts from an announced inflation target.
- Interbank money market: The market for short-term lending between banks, usually involving the trading of funds with a maturity of between one day (overnight or even shorter) and one year.
- Interest rate: The ratio, usually expressed as a percentage per annum, of the amount that a debtor has to pay to the creditor over a given period of time to the amount of the principal of the loan, deposit or debt security.
- Letter of credit (L/C): An irrevocable commitment by a bank (the issuing bank) or other issuer made at the request of a customer (the applicant third party) to pay a specified sum of money to a third party upon request, subject to terms and conditions drawn up in accordance with uniform customs and practices.
- Leverage ratio: Capital divided by total exposure, expressed as a percentage.
- Liability: A present obligation of the enterprise arising from past events, the settlement of which is expected to result in an outflow from the enterprise of resources embodying economic benefits.
- Liquidity: The ease and speed with which a financial asset can be converted into cash or used to settle a liability. Cash is thus a highly liquid asset. Bank deposits are less liquid, the longer their maturities. The term “liquidity” is also often used as a synonym for money.
- Loan-to-income (LTI) ratio: A ratio of the amount borrowed to the total annual income of a borrower.
- Loan-to-value (LTV) ratio: The ratio of the amount borrowed to the appraised value or market value of the underlying collateral, usually taken into consideration in relation to loans for real estate financing.
- M1: A “narrow” monetary aggregate that comprises currency in circulation and overnight deposits.
- M2: An "intermediate" monetary aggregate that comprises M1 plus deposits with an agreed maturity of up to two years and deposits redeemable at notice of up to three months.

- M3: A “broad” monetary aggregate that comprises M2 plus repurchase agreements, money market fund shares and units as well as debt securities with a maturity of up to two years.
- Market risk (price risk): The risk of losses (in both on and off-balance sheet positions) arising from movements in market prices.
- Maturity date: The date on which a monetary policy operation expires. In the case of a repurchase agreement or swap, the maturity date corresponds to the repurchase date.
- Monetary policy: Action undertaken by a central bank using the instruments at its disposal in order to achieve its objectives (e.g. maintaining price stability).
- Monetary targeting: A monetary policy strategy aimed at maintaining price stability by focusing on the deviations of money growth from a pre-announced target.
- Money: An asset accepted by general consent as a medium of exchange. It may take, for example, the form of coins or banknotes or units stored on a prepaid electronic chip-card. Short-term deposits with credit institutions also serve the purposes of money. In economic theory, money performs three different functions: (1) a unit of account; (2) a means of payment; and (3) a store of value. A central bank bears the responsibility for the optimum performance of these functions and does so by ensuring that price stability is maintained.
- Money demand: A key economic relationship that represents the demand for money balances by financial institutions (banks, insurance companies etc.). The demand for money is often expressed as a function of prices and economic activity, which serves as a proxy for the level of transactions in the economy, and certain interest rate variables, which measure the opportunity costs of holding money.
- Money market: The market in which short-term funds are raised, invested and traded, using instruments which generally have an original maturity of up to one year.
- Money market fund: A collective investment undertaking that primarily invests in money market instruments and/or other transferable debt instruments with a residual maturity of up to one year and/or that pursues a rate of return that approaches the interest rates on money market instruments.
- Non-standard measures: Measures taken by the central bank to support the effectiveness and transmission of interest rate decisions to the wider economy in the

context of a dysfunctional situation in some financial market segments and the financial system more broadly.

- Open market operation: An operation executed on the initiative of the central bank in the financial market: reverse transactions, issuance of debt certificates and outright transactions, foreign exchange swaps and the collection of fixed-term deposits.
- Operational risk: The risk of negative financial, business and/or reputational impacts resulting from inadequate or failed internal governance and business processes, people, systems or from external events.
- Option: A financial instrument that gives the owner the right, but not the obligation to buy or sell specific assets (e.g. a bond or a stock) at a predetermined price (the strike or exercise price) at or up to a certain future date (the exercise or maturity date). A call option gives the holder the right to purchase the underlying assets at an agreed exercise price, whereas a put option gives the holder the right to sell them at an agreed price.
- OTC (over-the-counter) trading: A method of trading that does not involve a regulated market. In over-the-counter markets, participants trade directly with each other, typically through telephone or computer links.
- Output gap: The difference between the actual and potential levels of output of an economy, expressed as a percentage of potential output. Potential output is the level of output that can be achieved when the factors of production are utilised at non-inflationary levels.
- Outright transaction: A transaction whereby assets are bought or sold outright in the market (spot or forward).
- Payment system: The set of instruments, banking procedures and interbank funds transfer systems which facilitate the circulation of money in a country or currency area.
- Premium: The difference between the par value of a security and its price when such price is higher than par.
- Primary balance: The general government sector's net borrowing or net lending excluding interest payments on consolidated government liabilities.

- **Principal risk:** The risk that the seller of a financial asset (e.g. securities or currency) will deliver, but not receive payment, or the risk that the buyer will pay, but not receive delivery.
- **Repurchase agreement:** The process of borrowing money by combining the sale of an asset (usually a fixed income security) with the subsequent repurchase of that same asset for a slightly higher price (which reflects the borrowing rate).
- **Reserve assets (currency and gold reserves, international reserves):** External assets that are readily available to and controlled by monetary authorities for meeting balance of payments financing needs, for intervention in exchange markets to affect the currency exchange rate and for other related purposes (such as maintaining confidence in the currency and the economy, and serving as a basis for foreign borrowing).
- **Reverse transaction:** An operation whereby the central bank buys or sells assets under a repurchase agreement or conducts credit operations against collateral.
- **Securitisation:** The pooling of financial assets, such as residential mortgage loans, and their subsequent sale to a special-purpose vehicle which then issues fixed income securities for sale to investors. The principal and interest of these securities depend on the cash flows produced by the pool of underlying financial assets.
- **Settlement:** The completion of a transaction or of processing with the aim of discharging participants' obligations through the transfer of funds and/or securities. A settlement may be final or provisional.
- **Settlement risk:** The risk that settlement in a transfer system will not take place as expected, usually owing to a party defaulting on one or more settlement obligations. This risk includes, in particular, operational risks, credit risks and liquidity risks.
- **Solvency risk:** The risk of loss owing to the failure (bankruptcy) of an issuer of a financial asset or to the insolvency of the counterparty.
- **Standing facility:** A central bank credit facility (marginal lending facility and the deposit facility) available to counterparties at their own initiative.
- **Systemic risk:** The risk that the inability of one participant to meet its obligations in a system will cause other participants to be unable to meet their obligations when they become due, potentially with spillover effects (e.g. significant liquidity or credit

problems) threatening the stability of or the confidence in the financial system. That inability to meet obligations can be caused by operational or financial problems.

- **Tender procedure:** A procedure in which the central bank provides liquidity to or withdraws liquidity from the market on the basis of bids submitted by counterparties in competition with each other. The most competitive bids are satisfied with priority until the total amount of liquidity to be provided or withdrawn by the central bank is exhausted.
- **Variable rate bonds:** Debt securities whose nominal coupon payments are linked to an interest rate or some other index.
- **Write-off:** The removal of the value of loans from the balance sheets of banks when the loans are considered to be totally unrecoverable.
- **Yield curve:** A curve describing the relationship between the interest rate or yield and the maturity at a given point in time for debt securities with the same credit risk but different maturity dates. The slope of the yield curve can be measured as the difference between the interest rates at two selected maturities.

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