

Summary
-Financial regulation-



Lecture 0: Repetition Basic Econ

(This material was not taught in an active lecture, but is relevant for the exam.)

Elasticities

- Price elasticity of demand: $\varepsilon = \frac{\Delta Q\%}{\Delta P\%}$
 - Measures how demand changes if the price increases by one unit
 - 0: perfectly inelastic demand
 - <1: inelastic demand
 - 1: unit elastic demand (x% increase in price leads to x% increase in quantity)
 - >1: elastic demand
 - ∞ : perfectly elastic demand (higher price no demand, lower infinite demand)
- Cross price elasticity of demand = $\frac{\Delta Q\%(good\ 1)}{\Delta P\%(good\ 2)}$
 - +: goods are substitutes
 - -: goods are complements
 - 0: goods are independent
- Price elasticity of supply: $\varepsilon = \left| \frac{\Delta Q\%}{\Delta P\%} \right|$
 - 0: perfectly inelastic demand
 - <1: inelastic supply
 - 1: unit elastic supply
 - >1: elastic supply
 - ∞ : perfectly elastic supply

Regulatory intervention

Need for regulation due to market failures: no existing market, incomplete competition (e.g. monopoly), externalities, public goods, incomplete information or transaction costs.

Interventions often lead to a welfare loss. Examples of interventions are:

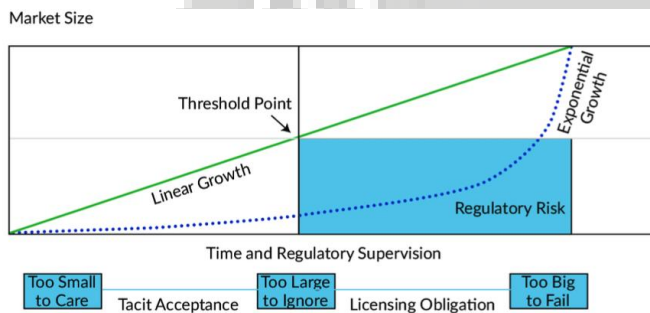
- Price interventions (maximum/minimum price)
 - have to be binding to have an effect (so, max price below equilibrium price and vice versa for minimum price)
- Taxes
 - direct taxes: on income and wealth; collected directly at the taxpayer
 - indirect taxes: collected with sale from goods and services; indirect burden for economic actors
 - Consumers/producers bear more of the tax burden due to lower relative elasticity (harder to switch to an alternative).
- Subsidies
 - Opposite of a tax, can be at the consumer or producer
 - May still lead to a deadweight loss

Externalities

Externalities are a form of market failure. About uncompensated effects of economic decision making on the wealth of independent third parties. Not taking this into consideration in decision making leads to inefficient allocation of resources and welfare losses. There are negative externalities (emissions, cigarette smoke) and positive externalities (vaccines, planting trees).

The **Coase theorem** states that under ideal economic conditions, where there is a conflict of property rights, the involved parties can negotiate terms that will accurately reflect the full costs of the property rights at issue, resulting in the most efficient outcome.

Lecture 1 & 2: Introduction



Source: Arner et al. 2017 (see paper [here](#)).

Problem for regulators is that they have limited time in which they will usually set up regulation, before something is too big to deal with, without creating sufficient harm. Before they do not care enough, because it is so small.

Need for financial regulation

Basic economic theory argues that it works well so there is no need. Economic assumptions to markets are: perfect competition, rational actors, full information and homogenous products. In reality, markets work well except when there are market failures. Market failures occur when there is no **Pareto-efficient** allocation of resources. Thus, a situation in which some party can be made better off without another party being worse off.

It is shown in the Edgeworth box. It is the box where the two utilities are put together and the individual utilities are maximized. When there is trade where both agents get better off; this is Pareto optimal situations. Where the two utility functions meet there is a Pareto-efficient solution.

Financial crises

The financial crisis since 1810 has developed in the following way. There are different continents with different colors. What can be seen is that a crisis will spillover to other continents. This comes from the interconnected economy. Within an economy there are also spillovers.

First welfare theorem

The first welfare theory states that the free market will achieve a pareto-efficient outcome, when there is perfect competition, full information and no externalities. However, in reality, competition is not perfect, information asymmetries exist, and externalities are rampant.

Rationale for financial regulations

Besides being needed against market failure, it is needed because it protects against monopolies where competition is not perfect. There is the need for consumer and investor protection because of imperfect information. There is systemic risk due to externalities. There is the efficiency of monitoring which means that if you have separate institutions, the monitoring will be better than individuals.

Protection against monopolies

Most economic regulation is concerned with preventing unwanted concentration of market power. In the most of finance there is a lot of competition, this is less of a problem. But for example the Dutch banking system is extremely concentrated with the same pricing strategies. It can be seen as a problem since competition does not work over borders. There is sometimes also the issue of **platform effects**. Often it is efficient to have a single central exchange, single clearing system and single payment system. If they are centralized, more people will use it. But this tends to spiral towards a single platform that gains some degree of monopoly power. A solution to this can be that we regulate as a utility.

Consumer protection

Many retail consumers of financial products often lack information and understanding of financial products. This is asymmetric information. The consumers should be protected against themselves. The risks are that companies screw the consumers over, or they fail and collapse. To prevent consumers from being screwed over, there is **conduct of business regulation**. To prevent collapses, regulators get involved with **prudential regulation**. It entails regulating liquidity, solvency, riskiness and general health of an institution. Systemic or macro-prudential regulation aims to prevent contagion and widespread financial crises. Micro-prudential regulation aims to maintain solvency of individual institutions

Conduct of business

This is also called behavioral regulation. It includes regulating information disclosure, competence, fair business practices, marketing of products, honesty and integrity. Regulatory tools are for example licensing, escalating fines, entry qualification, ethics standards, ombudsman. It can either be self-regulated by the industry or externally imposed where the AFM checks. Self-regulation is for example lawyers determining what someone has to do to become a lawyer. They might impose high standards → limited # of lawyers → higher price. Externally imposed regulation might miss the goal as well, since they have less

information.

Wholesale versus retail

Not all consumers are the same. There are both retail and wholesale investments. The most people are retail investors. On the other hand there are institutional investors like pension funds, hedge funds, sovereign wealth funds and so on. There is different regulation needed since the position to evaluate an offer compared to a typical household investor differs. Retail investors are likely to have less knowledge because of infrequent purchases, higher acquiring costs and limited ability to acquire the skills. There is also less ability of evaluate the soundness of an institution. Also, there might be the dis-ability to monitor long term contracts. In addition, financial contract or investment may represent a much larger share of the wealth than a typical institutional investor. The consequence is that retail investment is regulated more heavily.

Prudential regulation in absence of systemic concerns

We could consider to just let companies fail and let the markets do their thing. But there are factors to consider. There is asymmetric information, moral hazard, large potential losses, and a potential claim on a compensation.

- Asymmetric information: It is difficult for consumers to judge solvency of financial institutions, so markets are unlikely to function.
- Moral hazard: The value of an investment or contract is determined by the behavior of the institution after signing the contract and handing over your money. There is different behavior after the signing of the contract.

Prudential regulation is partly aimed at protecting the interest of those who finance a safety net like taxpayers.

Systemic issues

In addition to prudential and consumer protection rationales for financial regulation there are also systemic rationales for regulation. It is about large social costs (externalities) of a failure of a financial institution. The problem why we need financial regulation is that it is particularly banks that are unstable in the economy. This is because of the inter-connectedness. There is inter-bank lending and borrowing and this creates systemic risks. If one bank is going down the drain, there is an effect of the whole financial market. The failure of banks immediately causes a credit crunch that affects firms and households. Failing banks have to be bailed out by the taxpayer, there will be higher taxes and a depression of the economy.

Banks

Financial institutions like banks, insurance, pensions, and brokerage merit regulations, but banks are generally considered in need of regulations.

- Banks are unstable to the difference of maturity in deposits and loans.
- Banks are much more connected than other industries
- Banks are the main and only source of lending for a large number of borrowers
- There is a considerable moral hazard associated with the government or central bank acting as a lender of last resort
- Banks manage the payment system

Other institutions

There is less likely the effect of contagion when other financial institutions fail. They do not disrupt the payment system. There is often also no perceived lender of last resort. They usually hold liquid assets that can be sold off easily.

Economies of scale in monitoring

There are economies of scale in monitoring. Often financial contracts are long term and in need of constant monitoring due to the basic principal-agent problem. The value of the contract can depend on the actions of the financial institution after the contract was signed. If every consumer would monitor individually, the incentives to do so would be low. This will lead to a lot of duplication and freeriding. A specialized monitoring agency applying economies of scale to monitor tasks may be more efficient.

Summary

Often the markets work well, but this is under the beforementioned assumptions. In business practice, the three assumptions do not hold. This creates the rationale for regulation. It is asked how much is needed. Politicians argue both ways; either too much or too little.

The supply of regulation

Regulations offer in response to consumer demand but not in market setting. It is imposed so it will likely be over- or undersupplied. Financial regulations that eliminate all possibility of failure is likely to be too excessive. The costs are higher than the benefits. Regulating risks away from investors to regulate away the functioning of financial contracts. Regulation can also crowd out necessary monitoring by consumption. There is the moral hazard of regulation. Consumers assume that there is safety and good conduct. Firms will only seek to narrowly comply with the requirements.

Over-regulation

It is called over-regulation but also lack of proportionality. Although the costs of regulation to voters is basically free, there are real costs. The services cannot be offered due to high-entrance barriers. For example, the requirements to become a bank are very high and there are not very many new banks. Also, the lack of entrants decreases competition and raises

prices. There are compliance costs coming from the regulation of banks that are passed on to consumers. But the costs are hard to measure. Therefore some argue that regulation is oversupplied since they are disproportional, and the costs exceed the benefits.

Under-regulation

On the other hand firms will go to the most favourable regulatory jurisdiction. This is also called the “Delaware” effect: a race to the bottom to try to attract investment → **under-regulation**. This results in the exposure of consumers to unnecessary risk. It could also lead to under taxation.

Internal versus external regulation

Recently, there has been a shift ongoing from external to internal regulation. External regulation is about e.g. liquidity ratios, while internal regulation is about practices encouraging improve internal monitoring and self-regulation. The reason for this being increased size and complexity. Regulators would still have to guide, improve and validate the internal risk-monitoring mechanisms. This has been a large part of the Basel II reform.

Dutch financial regulation architecture

In the Netherlands there are two main institutions for financial regulation. There is De Nederlandsche Bank (DNB) that is responsible for the prudence type regulation. The business conduct regulation is done by the Autoriteit Financiële Markten (AFM).

VOC

Regulation started with the VOC; it is the oldest public company. It united different companies into one government sanctioned monopoly, to reduce competition. It issued shares to the public which was in turn allowed to freely trade these. These allowed them to share in profits of the VOC. At that time shares traded physically, now they are traded electronically. It functioned less well than nowadays. The rumors had effect on the share price, for example the burning of ships. Here was the invention of the public stock market.

First regulation

There was the need for regulation. At first there was no role for the government. There was self-regulation by the Vereeniging voor de Effectenhandel. This is still here. Stock markets still are largely self-regulated. It is historically defined but also the incentives were different and there were information asymmetries. There was a law (“Beurswet”) implemented as an emergency response to a stock market crash. The ministry of finance was now directly involved. There was a need for permission from this ministry to start a stock exchange. This was in 1914. In 1946 there were more developments since markets got more sophisticated and trading became more important. The “Beschikking Beursverkeer” extended the 1914

law, because companies now also had to get permission from the Minister of Finance to get listed.

European prompts

This worked well for a long time. There was a growing idea of harmonizing the EU market; incentives to collaborate like the euro. This does not go without harmonizing financial regulation. There was pressure needed from the EU side. The European Economic Community started using directives and regulations. Directives have to be implemented in national law. Regulations apply directly. This is on EU level. There were a lot of directives implied since 1980; admission guidelines to stock markets, requirements for IPO prospectuses and financial disclosure by publicly listed firms. These directives were implemented through changes to the fondsenregelement of the Amsterdam Effectenbeurs. The regulation could be changed or a new one could be developed as a response to the European pressure.

Dutch financial laws

In 1985 the wet Effectenhandel was used to regulate stock trading outside of the stock exchanges. In 1990 it was partly replaced by wet toezicht beleggingsinstellingen. There was trading outside centralized exchange: over-the-counter trading. The first “real” financial regulation of the Netherlands made insider trading a crime in 1989. At the same time it was decided that enforcement of financial regulation should be with an independent entity. This was the Stichting Toezicht Effectenverkeer. This later became the AFM. In 1992 the wet toezicht effectenverkeer superseded the beurswet of 1914. For the first time stating that the government has a duty to ensure the functioning of financial markets and investor protection is mainly served by maximizing disclosure and transparency. The Wte and the Wtb were changed over the years to implement new rules on public procurement and for example the EU Directive of Market Abuse in 2004. In 2007 all the different laws were combined in the wet op het financieel toezicht Wft. This formalized the twin peaks model of functional supervision: separating prudential and transparency supervision in two different agencies: the DNB and AFM. The idea is that this will prevent confusion and overlapping jurisdictions.

Twin peaks

The Netherlands separated supervision over to two different regulators that are focused on the two most important goals of financial regulation; behavioral and prudential. **Behavioral** entails conduct of business supervision, consumer protection, disclosure rules, reporting rules, transparency and enforcement. **Prudential** entails maintaining solvency, liquidity ratios, equity ratios and safeguarding the financial system as a whole.

Wet of het financieel toezicht

The Wft lays out in different chapters the responsibilities of both the AFM and the DNB.

- General provisions
- Market access of financial enterprises
- Prudential supervisions of financial enterprises
- Pursue of business supervisions of financial enterprises
- Market conduct supervision

Goals of Wft

The goals are a stable financial system with solid financial firms. Efficient and transparent financial markets and generating trust in the financial system as a whole.

Competencies of regulators

They both have the right to demand any type of information from regulated firms in order to execute their duties. Firms have the obligation to comply and cooperate. There is a form of escalation where you increase the pressure on the companies. It is described as the escalating enforcement mechanisms. It includes 5 levels that go from persuading, instructing and advising to revoke or suspend the license.

Escalating enforcement mechanisms



De Nederlandse Bank

The DNB is the Dutch national bank. The main duties are to safeguard financial stability. They also conduct monetary policy, but this is combined with the ECB. The DNB provides the information for this. They supervise financial institutions by ensuring capital ratios, liquidity ratios, Basel I/II/III. Large banks are now supervised jointly with the ECB. They can also issue and withdraw licenses. They operate the Dutch deposit insurance scheme. They can take over firms and liquidate them if it is needed. Besides this they conduct research and provide policy advice.

AFM

They are mainly in charge to maintain confidence in financial markets through enforcing transparency in consumer financial products. They enforce insider trading laws. They look at the transparency and disclosure of security issuing institutions. They escalate enforcement mechanisms to ensure compliance with the Wft. Their main aim is to protect consumers and investors from fraud and unfair trading practices, not so much concerned with the survival of individual firms.

Other regulators

There is the Autoriteit Consument en Markt (preventing collusion) and the Autoriteit Persoonsgegevens.



Lecture 3: Regulation in EU and US

Cost of the financial crisis

Between 2008 and 2012 a lot of state aid was provided by European governments. The EU unemployment rate increased, especially in Greece and Spain where it rose to more than 25%. A lot of people lost confidence in the financial sector as a consequence of the crisis. Trust can be lost quickly, but is slow and difficult to restore.

ECB

The ECB is in Frankfurt Germany. The ECB has more power since it is the head of the central bank of all the member states. They officially have only one objective: maintaining price stability by conducting appropriate monetary policy. They aim for 2% inflation because the economists argue that that is the healthiest state of the economy. Officially the ECB is not responsible for economic growth and so on. This has changed since the financial crisis; they bought public debts from PIIGS (Portugal, Ireland, Italy, Greece and Spain). They took a new responsibility of bailing out euro members. They changed the interest rate to maintain the inflation rate. Besides this they also have minor activities: organizing the European payment system and they are the co-supervisor of the largest 120 European Banks through the Single Supervisory Mechanisms.

Single Supervisory Mechanism

The SSM is part of the new European Banking Union. All Eurozone members participate and non-members can join if they want. It does the following:

- significant banks are directly supervised by the ECB (together with national regulator, but ECB final say); banks are significant when they for example have assets above €30 bln or are one of the 3 biggest banks of a country.
- smaller banks are supervised by national regulators (usually central banks), but the ECB can step up and take over
- ECB runs stress tests, can set minimal capital standards, order risk limits and force out key officers

European Single Resolution Mechanism

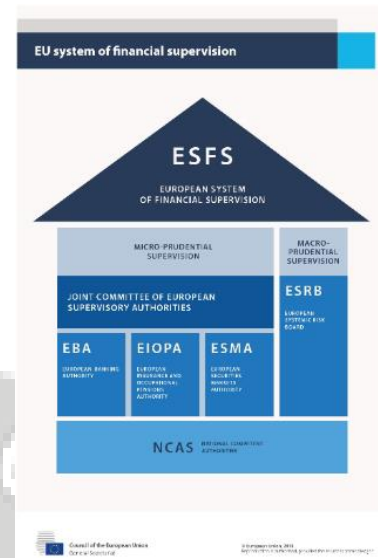
The SRM was implemented in 2016. It is a fund that will be filled gradually by participating banks over an 8 year period. The reason for this being that a lot of banks have become too large for their country to bail out, and taxpayers will not have to bail banks out anymore.

EU system of financial supervision

The EU system of financial supervision can be divided into a micro-prudential part and a macro-prudential part.

The micro-prudential part is all about coordinating and unifying different national regulators. It consists of:

- European Banking Authority (EBA)
 - oversees and coordinates prudential banking regulation
 - allowed to overrule national regulators to prevent regulatory arbitrage and it issues binding technical standards
 - in charge of implementing capital requirement directive (Basel III)
 - Issues a standardized reporting framework for bank risk
- European Insurance and Occupational Pensions Authority (EIOPA)
 - Drafts regulatory standards
 - Issues guidelines and recommendations to national regulators and coordinates them
- European Securities and Markets Authority (ESMA)
 - Coordinates national agencies that regulate securities (AFM in NL)
 - Drafts regulatory standards
 - Issues guidelines and recommendations to national regulators
 - Directly supervises Credit Rating Agencies



The macro-prudential supervision is conducted by the European Systemic Risk Board (ESRB). This Board was established in 2010 as a response to the financial crisis. It advises the EU, national regulators and European agencies on matter of financial stability and macro-prudential policy. It tries to stay on top of new developments and warn about new upcoming risky interlinkages.

Most important European Directives/Regulation

EU regulation applies directly to each member state, while **EU directives** first need to be implemented in national law → differences in implementation

- MiFID: Market in Financial Instruments Directive
 - **Passporting**: financial firms licensed in one EU country should be able to operate in other countries as well
 - Financial firms obligations:
 - Client categorization: advise appropriately to type of client
 - Client order handling: obtain certain information from client to work in best interest client
 - Best execution: ensure for client
- MiFID II
 - Regulates high frequency trading

- Limits variable remuneration (commissions and bonuses), incentive against best interest
- More detail on “best execution”
- Goals MIFID:
 - Transparent and more efficient European markets
 - Restore investor confidence
 - Move a significant part of over-the-counter trading to regulated
- MAD: Market Abuse Directive
 - Prohibit insider trading
- MAD II
 - Introduces common definitions of insider trading + minimum sanctions
- MAR: Market Abuse Regulation
 - Prohibits abuse of electronic trading platforms, high frequency trading
 - Applies to commodity and derivative markets as well
- TFLCD: Transparency for Listed Companies Directive
 - Issuers have to make all information available that is necessary for shareholders to implement their shareholder rights
 - Publish reports, report major holdings, inform all shareholders equally
- UCITS directive: Undertakings for Collective Investment In Transferable Securities Directive
 - Regulates investment funds in EU
 - Allows passporting across EU
 - Where they can invest in, and where not
 - Must issue prospectus (half yearly reports and key investor information document)
- AIFMD: Alternative Investment Fund Managers Directive
 - Regulate (✓get some information) on hedge funds, private equity funds etc.
 - Large funds have to register with national regulator and file regular reports
- Capital Requirements Directive
 - CRD 20016 implements **Basel II**:
 - Increased capital, liquidity and leverage ratios
 - CRD IV is the latest version and implements Basel III, to be implemented in 2022
- Payment Services Directive
 - Legal basis for creation of SEPA (Single Euro Payments Area)
 - Promises European transfer within a day
 - Lowers interchange fees
- PSD 2
 - Requires banks and payment providers to grant third-party providers unrestricted access to payment accounts of their client
 - Traveller firms not able to charge fees for using credit cards and other payment methods

- Mortgage Credit Directive
 - Harmonize European rules on mortgage issuing
 - Goal is to have a single European market for mortgage credit...

Netherlands versus US

In the Netherlands there is a distinction between prudence type and business conduct regulation. For prudence type regulation there is De Nederlandsche Bank. For disclosure and transparency, business conduct regulation there is Autoriteit Financiële Markten (AFM). In the US the regulation is highly fragmented and there is an overlapping jumble of federal, state and many different agencies. The problem is that there is a mix of different institutions that are competing for the responsibilities. There is less organization of the clear distinctions. There are agencies that work with and against each other.

Overview of Federal Financial Regulators and Organizations

Prudential Bank Regulators are:

- Office of the Controller of the Currency (OCC)
- Federal Deposit Insurance Corporation (FDIC)
- National Credit Union Administration (NCUA)
- Federal Reserve Board (the Fed/FRB)

Securities and Derivatives Regulators are:

- Securities and Exchange Commission (SEC)
- Commodities Futures Trading Commission (CFTC)
- Financial Industry Regulatory Authority (FINRA)

Other Regulators are:

- Federal Housing Finance Agency (FHFA)
- Consumer Financial Protection Bureau (CFPB)
- Financial Crimes Enforcement Network (FINCEN) (Department of the US Treasury)

Coordinating Forum are:

- Financial Stability Oversight Council (FSOC)
- Federal Financial Institutions Examinations Council (FFIEC)
- President's Working Group on Capital Markets (PWG)

The Fed

The federal reserve system is the central bank of the united states. It consists of 12 district banks, each acting as a central bank for their region. It works as a national and local hybrid. They are allowed to engage in discount lending and open market operations independently but could only extend loans over eligible commercial paper. So only lending with good collateral, they cannot pump unlimited liquidity into the economy. The Federal Reserve Board (The FRB) is coordinating in Washington but is not in charge.

Office of the Controller of the Currency

The OCC is the original federal regulator in the US. It was founded in 1863 to regulate all nationally chartered banks. State chartered banks were regulated locally and then later by the FDIC. Similar as in Europe where the ECB checks the national banks and where the central banks of member states check the local banks. The OCC had problems with the

distribution of power, this was due to the intertwining of federal state and national level. They lacked the ability to provide liquidity or bail out failing banks.

Checking by the Fed

The Fed did not use to directly supervise banks. This used to be done by the OCC and the FDIC. Since the crisis of 2008 and the Dodd-Frank act, the Fed directly supervises systematically important banks as was determined by the Federal Stability Oversight Commission (FSOC). Also the Fed is now the principal regulator for systematically important financial market utilities like clearing houses and exchanges. Clearing houses act like an exchange of futures contracts. There should be a margin payment so both counterparties can pay. They also make sure that the assets are transferred from one person to the other. It goes together with the exchanges.

The Glass-Steagall Act

The Great Depression occurred in 1929, there used to be a lot of turmoil and decreases in the stock market. People also got unemployed. It was bigger than the recent crisis. Financial regulation gets tight when a crisis occurs. What came out was the Glass and Steagall act in 1933. It was a successor to the Banking Act of 1932. It established a nation-wide deposit insurance creating the Federal Deposit Insurance Corporation (FDIC). They also separated commercial from investment banking. Firms selling securities were forbidden from taking deposits. This was quite important. The banking landscape was different until the late 90's when this was repealed. The act forbid directors from taking loans from their own institutions and it increased the minimum capital requirements because of the conflict of interest. Investment banks would have an IPO and the same bank would sell these to the clients. This is something you don't want. The act created the Federal Open Market Committee (FOMC) and introduced Regulation Q. This prohibited interest payment on demand deposits and encouraged the use of savings accounts. This was effectively repealed by the Dodd-Frank act. There was a lot of change in the financial regulation over time.

Federal Deposit Insurance Commission (FDIC)

The FDIC regulated state-chartered banks. The nationally chartered banks were regulated by the OCC. The FDIC administers the Deposit Insurance Fund. Initially they were generous and covered 100% of the first \$10,000, 75% of the next \$40,000 and 50% of all deposits above \$50,000. Later it was reduced to only 100% of the first \$5,000. Then over time increased to the first \$100,000/ After financial crisis it was over the first \$250,000. It is now indexed to inflation. In the case of bank failure the FDIC either engineers a payoff structure or a purchase and assumption. The Payoff entailed simply liquidating the bank's assets and using the proceeds to pay off the depositors. The Purchase and Assumption entailed that the FDIC engineered a good bank with healthy assets and merge this with another bank. The remaining bad bank assets are liquidated.

Security and Exchange Commission (SEC)

The Security and Exchange Commission was established by the Security and Exchange Act after the Great Depression in 1934. It can be compared to the Dutch AFM; it is the business conduct regulator of the United States. It regulates the sale of equity and debt instruments. It regulates corporations that sell securities to the public and brokers or dealers and other

intermediaries. The SEC in theory also has a prudential mandate, but mostly focuses on conduct of business regulation. There is a focus on transparency and disclosure rather than prudence. When they accept an asset to be traded, it is not always a safe or sound investment. It just fulfills the regulatory requirements. Actors that have to register with the SEC are stock exchanges, brokers, mutual funds, auditors and investment advisors. Since 2010 also hedge fund managers are required to register. The Securities Investor Protection Corporation (SIPC) protects investors against brokerage firm failure; it stipulates minimum capital requirements for brokers. Although the SEC has the authority to regulate all public companies, in practice it relies much on self-regulation. The Financial Accounting Standards Board (FASB) determines the Generally Accepted Accounting Principles (GAAP). Similarly stock exchanges set a lot of their own rules.

Commodities and Futures Trading Commission (CFTC)

The commodities and Futures Trading Commission (CFTC) oversees the exchanges of futures and options and requires participants to register with CFTC. Trading volume of these markets is relatively high. This is for derivative markets.

Federal Housing Finance Agency (FHFA)

Federal Housing Finance Agency (FHFA) created in 2008 to oversee government sponsored enterprises. These enterprises often took excessive risk due to moral hazard.

Dodd-Frank Wall Street Reform and Consumer Protection Act

The Wall Street Reform and Consumer Protection Act can be described as the Dodd-Frank Act. It was passed in response to the financial crisis. It is extremely broad with 16 titles, changing almost every facet of the US financial regulation. It was written in general terms, leaving regulatory agencies with quite a lot of flexibility in implementing the actual rules. The purpose of the act was to promote financial stability of the US by improving accountability and transparency, to end “too big to fail”, to protect the American taxpayer by ending bailouts, to protect the consumer from abusive financial services practices, and for other purposes. Passed in 2010 as a result to the financial crisis. Very broad and partly taken back under the Trump administration. Changes were:

- More stringent capital requirements
- Stricter consumer protection when accessing credit
- Office to monitor and address risks to financial stability
- Resolution process for troubled financial firms
- Volcker rule: prohibition of proprietary trading by deposit taking banks
- Provision for shareholders of a non-binding vote on executive compensation
- More regulatory enforcement power over credit rating agencies
- Greater transparency for derivative instruments
- Limits on Federal Reserve’s emergency lending authority

Changes in 2018:

- Asset threshold for standards, stress test requirement etc up → small and regional banks eased regulation
- Mortgage credit:

- Small lenders with assets <10 million from Volcker rule.
- Credit Bureaus: bill proposes free credit security freezes

Lecture 4: Adverse Selection

Types of goods

Search goods: the quality is known beforehand. Consumer should search for cheapest price or best price/quality tradeoff.

Experience goods: quality becomes apparent some time after purchase. E.g. used car.

Credence goods: unknown quality. In these cases have to trust judgment and competence of professionals.

In finance buying a stock is a credence good: hard to tell if management did badly, took too much risk or was dealing with difficult market circumstances. Same for fund managers.

Pooling equilibrium

When buyers know average quality of sellers, but no individual qualities. They will be able to pay average quality of the pool → pooling price. However, when sellers can choose to enter the market or not this is a problem.

Adverse selection

Akerlof (1970) lemon and peaches market. Products are of variable quality and individual quality is only known to sellers. Buyers know the average quality and will thus want to pay this pooling price. However, this leads to high quality goods to leave the market. → drive market out of existence.

Financial Services

Financial services include the following:

- Fund management like mutual funds, hedge funds and pension funds.
- Financial advice and agencies from corporate finance to insurance brokers.
- Market making and broking transaction.
- The retail financial service industry is similar to retail banking in that it deals with many small retail customers, but it is also different in other respects. This industry largely manages funds on behalf of clients who retain full ownership and legal title.

The problem

The main problem with retail investment services is asymmetric information and consequent adverse selection. Lack of expertise on part of buyers means they find it hard to assess the quality of a good. Poor quality of asset management can be reflected in lack of necessary skills and investments, lack of effort, negligence, incompetence and dishonesty. It can be separately or in combination and also one can lead to another.

Model adverse selection

x = fund managers % above average return of market

c = annual cost as % of assets under management

p = price of fund management as % of assets under management

$a = x/c > 1$ = efficiency parameter

Assumption that $a=1.5$, managers thus can achieve higher return at a higher cost.

Market will be viable if price is: $p_d \geq p \geq p_s$

- $p_d = x = a \cdot c = 1.5c$

- $p_s = c < p$

Two corner solutions possible:

- Buyers' market: demand < supply \rightarrow seller competition drives prices down to cost: $p = p_s = c$
- Sellers' market: demand > supply \rightarrow buyer competition drives prices up to $p = p_d = 1.5 \cdot c$

Providers know own quality, but clients can only estimate quality based on average: $p_d = x = 1.5 \cdot c$

If cost is uniformly distributed between 0-2, avg will be 1. Best manager has cost 2 and ability $1.5 \cdot 2 = 3$, worst cost of 0 and ability of 0. However, best manager leaves market since willingness of consumer to pay will be $1.5 \cdot 1 < 2 \rightarrow$ downward spiral.

Client's point of view

Imagine you are a client and you see managers charging p . You know that this acts as a cutoff; the best manager will have costs of p and will outperform by $x = (3/2)p$. But the average outperformance is only half as great at $x = (3/4)p$. Following from this you will not pay p in order to beat the market by only $(3/4)p$. So you do it yourself and the market disappears. The disappearing markets are not Pareto optimal.

Minimum standards

The suppliers can regulate the market themselves through minimum standards that raises average performance and, hence, average price clients are willing to pay \rightarrow keeping high quality in market.

However, this leads to a number of issues. **Efficiency:** low quality suppliers and low quality demanders are forced out of the market. **Competition:** suppliers are excluded, driving up the price. Thus, it is important who sets the minimum standard industry or government. Self-regulation is done by some measure of quality (e.g. exam to become lawyer). There is risk of too high standards in order to discourage competition. So, self-regulation \rightarrow high minimum standards

Governments, on the other hand, might have less expertise to set standards and monitor behavior. The legal system has of course law for fraud and theft, but high standard of proof and technical nature of financial crime makes prosecution rates low. Another threat is

regulatory capture:

Regulators might see it as their job to protect industry from public rather than vice versa. Reason being that firms with interest have way more money than the public to lobby for example. Also, people that came from this industry might become regulator of it.

Reputation

Reputation by having a track record can also be a good way to show your quality. However, hard to establish reputation in case of a credence good. Especially in finance short-term incentives to cheat or take excessive risk are sometimes very high compared to long-term

incentives to remain in the industry. Some suppliers with high quality reputations in other industries use this to penetrate financial services.

Other solutions

Signaling: suppliers undertake activity that signals high quality and is uneconomic for low quality suppliers, e.g. a warranty. However, not very useful in retail investment services, risk-return relationship, cannot offer minimum returns.

Certification: good suppliers ask an agency to certify their status, e.g. car inspection, rating agencies. However, financial crisis badly rated products. CRA's can also have perverse incentives: they are paid by people that want to be rated.

Mutual funds

A mutual fund can be described as an investment vehicle that is made up of a pool of funds collected from many investors for the purpose of investing in securities such as stocks, bonds, money market instruments and similar assets. Mutual funds are operated by money managers, who invest the fund's capital and attempt to produce capital gains and income for the fund's investors.

Advantages are that it allows retail investors to delegate investment through simply buying shares in a fund. It also makes it possible to diversify a portfolio, which is otherwise very difficult for small individual investors.

Mutual fund shares are bought and sold based on the basis of its Net Asset Value, which is determined each day at the closing value of the securities in the fund. The funds are typically marketed by a sponsor which sets it up as a legal entity and organizes the board of directors. The fund managers are then hired as an external entity and can actually also be replaced.

Regulation of mutual funds

The regulation of mutual funds is similar for the US and the EU and consists of 4 pillars.

- Transparency: the holdings of the mutual fund are publicly available which ensures that investors are getting what they pay for.
- Liquidity: the shares of mutual funds are redeemed by the fund company on the trade date, which ensures daily liquidity for investors.
- Audited track records: the mutual funds must maintain their performance track records and have them audited for accuracy, which ensures that investors can trust the fund's stated returns.
- Safety: if a mutual fund company goes out of business, fund shareholders receive an amount of cash that equals their portion of ownership in the fund. Alternatively, the fund's board of directors might elect a new investment advisor to manage the funds.

Restrictions

The Securities and Exchange Commission prohibits a mutual fund from engaging in the following activities unless it meets strict financial and disclosure requirements:

- Selling securities short
- Buying securities on margin
- Participating in joint investment or trading accounts

- Distributing its own securities other than through a sponsor

Hedge funds

A hedge fund is different from a mutual fund in the following aspects:

- The minimum inlay is very high, usually around \$1 million.
- There is a maximum number of participants
- They are relatively illiquid; it is often impossible to withdraw the first year.
- They are basically not regulated besides having to register with either the SEC or AFM.
- They are free to invest in different financial instruments like real estate, private companies and complicated derivatives.
- They are free to choose the strategy they want; they can short the market and so on.

Pooling equilibrium

Since investors are considered highly knowledgeable, investor protection deemed unnecessary. The result was a pooling equilibrium and that almost all funds follow the 2/20 fee rule:

- 2% of assets under management
- 20% of return

Since the hedge fund market has not yet unraveled, there is some indication that the high investor requirements are reducing the asymmetric information and adverse selection problem. However, average performance does not seem to be impressive, especially after fees.

Conclusion

Most financial services are credence goods → hard to convince buyers that they sell high quality: resulting in buyers willing to pay only average pooling price → dropping out of high quality → no market at all.

Solutions can be minimum standards, reputation, signaling and certification. Standards can be set through self-regulation or government intervention

Lecture 5&6 Insurance Markets

Main issues in insurance regulation are: preventing underinsurance, protecting insurer solvency and preventing deceptive sales practices. Insurance markets also are like credence goods: difficult to tell quality of the insurance company beforehand → risk of adverse selection spirals and need for minimal standards. Additionally, difficult for insurance companies to tell risk of consumers.

People insure against uncertain states in the world where they will be worse off.

Mutual insurance

Simplest form is mutual insurance. When one person is unlucky, gets helped out by others. Works in small long-term groups: hunter-gatherers, small villages. They know each other's risks, can monitor and know gains and losses over long-term.

Now, modern insurance companies exist. Lose informational advantage of small groups, but gain economies of scale and tailored products that are easier to transact.

Underinsurance

In economic models where people are risk-averse, the solution is always to fully insure. But in reality, people underinsure. This has the following reasons:

- Deductibles
- Caps on coverage
- Coverage being denied
- Lack of insurance markets for bad decisions

These reasons have explanations behind them which can be summarized in the following way: credit constraints, moral obligations or interest group politics, non-diversifiable risk, adverse selection and moral hazard.

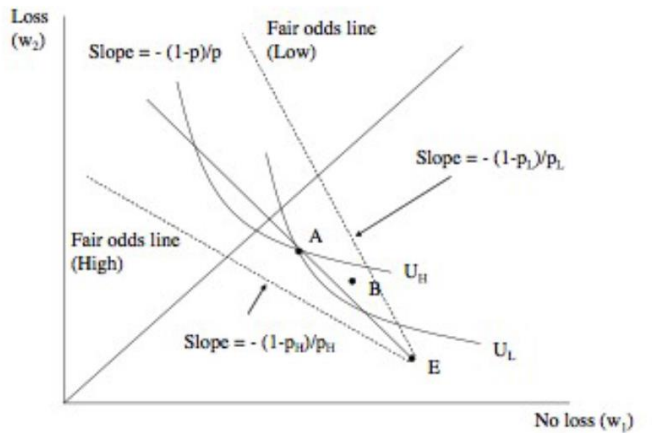
Explanations are:

- Credit constraints
 - Cannot afford → subsidies/free insurance
 - Low income → limited liability (cannot pay back anyway)
- Moral obligations/interest group politics
 - Healthcare as a right, will get it anyway
 - Government will give money after flood, why insure? → compulsory insurance as a solution?
- Non-diversifiable risk
 - Risks, like global warming, that we all face can hardly be insured
- Moral hazard: insured → take risk
- Adverse selection
 - Highest quality customers (low risk) won't buy insurance at average price → consumer side death spiral
 - Solution can be compulsory insurance
 -
- How does insurance work?

Insurance companies make use of **risk pooling**. Average number of outcomes can be predicted, while a single outcome cannot. Low risk will cover for the high risk people.
- **Risk spreading** is also used. Some risks hard to predict and insure (catastrophes). However, a government can force insurance and solidarity. Lower welfare impact if all lose a bit than a few taking full brunt. However, not Pareto-improvement → market solution not possible. Many of these insurance policies are implicit, people assume that the government helps after a catastrophe.
- Lastly, risk is **transferred** from those less willing to bare it to those more willing to bare it. For example rich people care less about winning/losing \$1000 than poor people.

Rothschild-Stiglitz model

This model of insurance can explain the benefits of compulsory insurance in some cases.



The model basically shows the insurance market in one graph. Wealth is on the x- and y-axis. X-axis is wealth in case of no negative event and Y in the case of a negative event. The 45° line shows us all cases in which someone is equally well of in the good as in the bad state. The only place where insurance can happen is the triangle from E upwards and to the left until you reach the 45° line.

- More right from E, would be better in good state.
- Under E, would be worse of in the bad state
- Above 45° line, would be better off if something bad happens → incentivize e.g. breaking leg, or getting your bike stolen

Utility curves show which combinations have as a result the same utility. The utility function of high risk is flatter, while the utility function of low risk is steeper. High risk people get sick earlier, thus, they are less willing to give up money in the bad state, which is why their utility function is flatter, showing that they, for a little less money in the bad state, are willing to offer relatively much money of the good state.

Fair odds line show the no profit packages of insurances for insurers. The high risk people have a higher probability of bad state, and thus will be offered less money in the bad state relative to low risk people.

$$EU = (1-p) U(w_0 - pA) + p U(w_0 - L - pA + A)$$

where: p = probability loss, w_0 = wealth without loss, pA = premium paid for insurance, L = loss, A = payout. Maximizing this by taking the first order condition gives us $A=L$. So, optimal for people is to fully insure.

The price ratio line tells us how much it costs to transfer money from the good state to the bad state. The slope depends on the probabilities of both states. $\text{Slope} = -p_{\text{good}}/p_{\text{bad}} = -(1-p)/p$

However asymmetric information plays a role: insurer doesn't know the type of customer he is facing. → assume two types: high and low risk consumers who both face the same loss. Only a consumer knows his type, it cannot be observed. Insurers cannot get a profit.

There are **two** equilibria possible: a pooling equilibrium (both risk types same insurance) or a separating equilibrium (types buy own type of insurance).

Pooling equilibrium

Both types buy the same insurance, which has to lie on the **aggregate** fair odds line (\rightarrow zero profit).

Define λ as the proportion that is high risk.

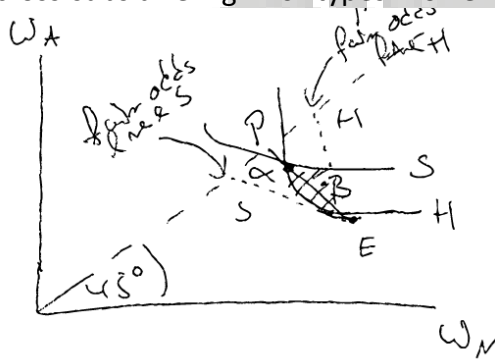
The aggregate likelihood of a loss is then:

$$\bar{p} = \lambda p_H + (1 - \lambda) p_L$$

$$\text{Slope of aggregate fair odds line} = - (1 - \bar{p}) / \bar{p}$$

It thus depends on the portion of high/low risk whether the line is closer to the fair odds line of the high/low risk!

With a pooling equilibrium we can speak of **cross-subsidization**, because low-risk types cross-subsidize high-risk types. However, this equilibrium is not stable

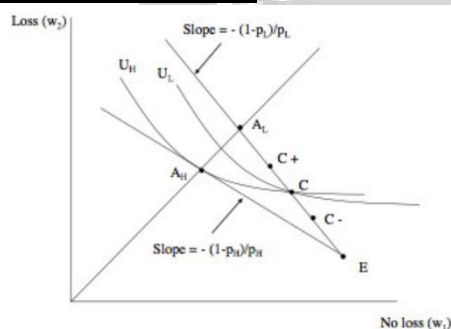


There is a skimming space, in which insurances can be offered to disrupt the equilibrium. The reason for this being that the low risk utility (H) can shift outward here and get increased utility, while the high risk people cannot increase utility by taking this insurance.

Separating equilibrium

The low risk people will be skimmed from the pooling equilibrium, because they get more utility with the other insurance.

Signaling equilibrium



High risk types are fully insured at A_H , while low risk types signal low risk through partial insurance at C. This is not pareto-optimal, it would be if both types would be fully insured, so low risk at A_L . Example, people can take a higher deductible. However, insurer needs a way to tell them apart then. This signal would need to be costly, otherwise low-quality types would mimic it. However, sometimes everyone is better off if signaling is banned.

Health insurance and deductible

With health insurance you can choose a deductible. This amount you pay yourself before you get it insured. If you pay a high amount as a deductible, you get a cheap insurance. This is the signaling of low risk types. You know you are a healthy person and will not issue the insurance. High risk types will choose a lower amount as deductible since they issue the insurance a lot. You know you will need the insurance. Deductibles show the amount of own risk payment. It can be up to discussion whether issuing deductibles is fair since health is often not something, we can do anything about.

Banning signaling

You can ban signaling through compulsory insurance. This is because also the low risk types would prefer full insurance when they are risk averse. If there are relatively few high-risk types, the pooling equilibrium might have higher utility than signaling equilibrium. This is because full coverage might have higher advantages than the costs of cross-subsidization. Compulsory insurance often has to go together with subsidies since otherwise they will not be affordable for everybody. An alternative is banning partial insurance or limiting deductibles. You want to get rid of differentiations.

Third party damages

Another regulatory reason for compulsory insurance is third party damages. For example with car insurance. Everybody needs this insurance when you cause damage to another car. This is because the costs can exceed your ability to pay especially when cash and credit are constrained. This introduces limited liability issues. Most countries have compulsory car insurance.

Problems with compulsory insurance

Compulsory insurance provides a captive market, which makes it important that the market is well-regulated and competitive. The Dutch healthcare system has only 4-5 serious players, causing anticompetitive concerns. Also, a system of subsidies might be needed so everybody can afford it.

Prudential insurance regulation

Government issued insurance are typically funded by taxation or other levies. In contrast, private insurance schemes support their liabilities (future claims) by holding **investment funds**. These investment funds differ from mutual funds, because the customers buy an insurance policy, but the shareholders hold ownership of the asset, under limited liability! Shareholder equity is typically small compared to total assets under management → kind of leverage effect (using debt to amplify returns). → excessive risk taking, especially when a company is already in financial trouble: “gamble for resurrection”

→ strict regulation to ensure solvency and long-term ability to pay out policies of insurance companies

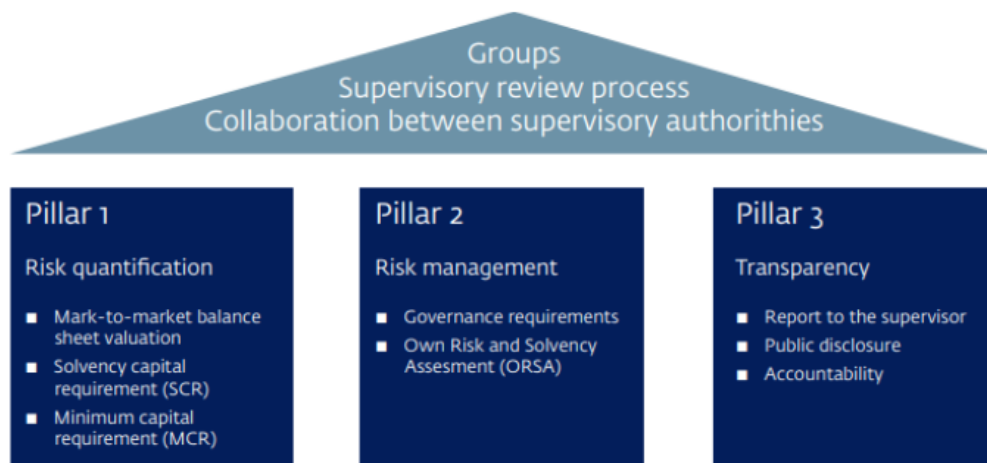
Solvency requirements

The strict regulation involves solvency requirements. Assets must be sufficient to offset liabilities, surplus is monitored by national regulator (DNB), minimum capital requirement depends on riskiness of investments and insurance operations. **Risk Based Capital (RBC)** is dependent on underwriting risk, asset risk, interest rate risk and business risk.

When a company falls below a certain capital ratio, they must file a report to the regulator outlining corrective actions. When RBC falls further, regulator must investigate and insurer needs an action plan. An even further fall authorizes the regulator to take control of the insurer. When RBC gets dangerously low the regulator is required to take the insurer under control.

Static solvency: ability to pay off all obligations under a liquidation scenario

Dynamic solvency: ability to pay off all obligations assuming continuance of institution
Solvency II Directive



Pillar 1: about calculation of capital reserves.

Defines Solvency Capital Requirement (SCR) as amount of capital needed to ensure meeting obligation over the next 12 months with 99.5% certainty. When a firm drops below, the 'supervisory ladder' kicks in with level of supervisory intervention progressively intensifying (as can be seen above).

The Minimum Capital Requirement (MCR) is set to 85% certainty that the firm is able to meet its obligations. Below this, national regulator has to intervene, take control, and liquidate or merge with another firm.

Pillar 2: about management of risks and governance

Insurers are required to prepare Own Risk & Solvency Assessment (ORSA). This is an internal process to assess risk and solvency positions under different scenarios.

Pillar 3: about reporting and disclosure

Firms are required to produce two key reports:

- Solvency and Financial Condition Report (SFCR): both quantitative and qualitative elements and has to be made public each year
- Regulatory Supervisory Report (RSR): includes all quantitative templates and a detailed set of qualitative reports, submitted to regulator but not disclosed publicly

Behavioral insurance regulation

Most countries have **conduct of business regulation** in place dealing with the following:

- Formation of insurance companies & Licensing of agents and brokers
 - Includes minimum capital and surplus requirements
 - Passporting: permission in one EU country and license → allowed in other EU countries
- Insurance rates

- Often insurers not allowed to set any rate
- Depends on laws
- Policy forms
 - Often have to be approved by regulator so they are not misleading, deceptive or unfair
- Sales and claims practices and consumer protection
 - Insurance salesman and brokers have to be licensed → prevent:
 - Misrepresentation
 - Twisting: pressuring someone in dropping an existing policy in exchange for a new policy that provides little economic benefit
 - Rebating: giving premium reductions not stated in the policy
 - In NL: Wet handhaving Consumentenbescherming 2008

TOT HIER

Lecture 7: Insider Trading

Dealership markets

In these markets, dealers (market makers, intermediaries) provide liquidity to the market. They are required to maintain liquidity at all times and in return receive certain privileges from the exchange. These privileges are exemption from trading taxes, exemption from holding disclosure rules and sometimes early access to the order book.

- Order driven markets: other market participants can also post limit orders, but market makers are required to keep the order book filled
- Quote driven markets: only dealers publish bids and asks, and then meet these order out of inventory, adjusting prices in response to perceived demand and inventory needs

| Order driven markets | Quote driven markets |
|---|---|
| Displays all of the bid and ask quotes | Focuses only on the bid and ask quotes of market makers |
| Orders detail the quantity & price at which share may be traded | Orders only share the price of the security |
| No guarantee of order execution | Guarantee of order execution |
| Price transparency | No price transparency |
| Counterparty unknown | Counterparty known |

Insiders and Liquidity traders

Some clients buy or sell for liquidity reasons. These clients are called: liquidity traders. They have the following reasons: the need to sell stocks to generate cash, rebalance a portfolio, hedge some risks, liquidity ensure that there is always some buying and selling going on. Sometimes they're also called "Noise Traders". Other traders trade on non-public material information and are called "insiders". They know that the true value of the asset is above/below the current price in the market. Thus they will submit buy/sell orders to take advantage of their information.

Famous inside traders

A few examples of famous inside traders: Albert H. Wiggin, Ivan Boesky, Martha Stewart and Stephen Cohen.

- Wiggin: the market crash millionaire, made 4 million during 1929 crash by shorting 40000 shares in his own company. Didn't break laws, but 1934 revision Act is nicknamed "Wiggin act"
- Ivan Boesky: always bought stocks just before take-overs were announced → he paid insiders in investment banks for the info
- Martha Stewart: friends with CEO of pharmaceutical company which drug was not approved, sold large amounts of stock before announcement
- Stephen Cohen: ran a hedge fund that allowed for insider trading

No trade equilibrium

If there were only inside traders it would actually be hard to trade, because insiders would fear that their trades would reveal their information. Also when everybody is an insider, you fear trading with someone with even better information. If you're buying, why is the other guy selling? The result of this is a no trade equilibrium. Luckily there is usually a mix of insider and liquidity traders.

Problem for the Market Makers: who is who?

Market Makers (MM) have to quote prices to everybody, but they do not know whether the client is an information trader or liquidity trader. This information asymmetry is crucial in understanding the bid-ask spread and the influence of insiders on markets.

The role of insiders in driving up bid-ask spreads

The basic Copeland and Galai (1983) model is very simplified, but gives the basic intuition. In order to limit the losses due to insiders, and to compensate with extra profits from liquidity traders, market makers will increase their bid-ask spread whenever they suspect that insiders are active.

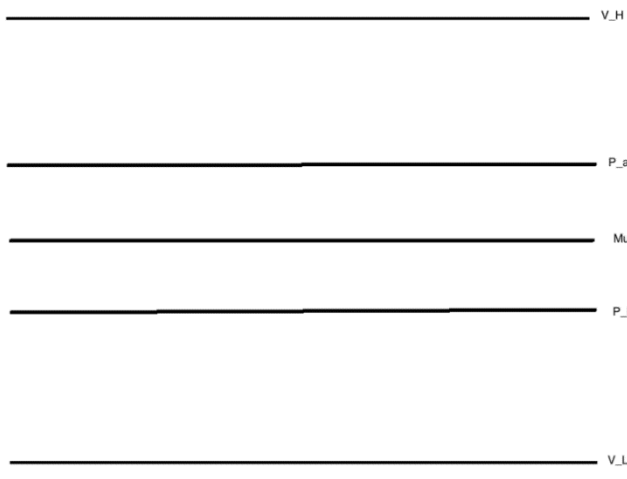
Copeland and Galai (1983) model

Market makers have to quote prices to everybody, but don't know whether client is insider or liquidity trader. Therefore, market makers will increase their bid-ask spread whenever they suspect that insiders active so they limit losses due to insiders and gain extra on liquidity traders.

In this model we have:

- A single trading period, value of security is realized at the end of this
- $V^H > V^L$, the expected value: $\mu = pV^H + (1 - p)V^L$
- Q insiders that know true value of V and $(1-q)$ liquidity traders that trade for exogenous reasons.
- Traders only buy/sell a single stock
- Competitive (zero profit) market makers
- Market makers only know p , V^H and V^L and they quote:
 - P^a = ask, what the market maker asks for selling you a share

- P^b = bid, what the market maker bids for buying a share from you



Market makers

Market makers make money on the bid-ask spread: the difference between the high ask price and the low bid price.

Market makers balance inventory. They need an inventory of stocks that clients may want to buy, but too much inventory adds risk. They balance the inventory after the trading period. When they buy a stock today, they sell a stock tomorrow and vice versa.

Ask price: when market makers sold a stock and have to buy tomorrow:

- $V=V^H$, MM sold stock for $P^a < V^H$, MM will have to buy stock next day for $V^H \rightarrow$ loss: $(V^H - P^a)$.
- $V=V^L$, MM bought stock for $P^b > V^L$, MM will buy stock next day for $V^L \rightarrow$ profit: $(P^a - V^L)$
- \rightarrow on average MM makes profit of $P^a - \mu$ sales (assuming no insiders)

Same goes for the bid price, when they bought a stock, they have to sell tomorrow. They lose out if the valuation the next day is low, but they gain if the valuation is high. \rightarrow on average MM makes profit of $\mu - P^b$ (assuming no insiders).

However, insiders always cost the market maker money, they only buy when the valuation will be high the next day and vice versa.

The earnings for market makers are, and this can be rearranged:

- on sales: $-q(V^H - P^a) + (1 - q)(P^a - \mu) = 0 \rightarrow P^a = \mu + q(V^H - \mu)$

- on buys: $-q(P^b - V^L) + (1 - q)(\mu - P^b) = 0 \rightarrow P^b = \mu + q(V^L - \mu)$

The bid-ask spread is $P^a - P^b: \mu + q(V^H - \mu) - [\mu + q(V^L - \mu)] \rightarrow q(V^H - V^L)$

Thus, the bigger the value spread the bigger the ask spread, because of more uncertainty more potential losses of the MM to insiders.

More insiders q , bigger spread. Due to, balancing out losses due to more insiders \rightarrow bigger spread means gaining more on liquidity clients, and losing less on insiders.

If there are only insiders, the spread will be the same as the value spread.

Discussion Copeland and Galai model

In this model, insiders are just uniformly bad. They increase the cost of trading for liquidity traders. They reduce the average uninformed traders ability to engage in welfare increasing trades, so it hurts Pareto efficiency. MM and liquidity traders would like to buy and sell

shares to each other at a fair price, but are not able to due to insiders. Insiders do not even increase the informational effectiveness of the market.

This is mainly due to some of the strong assumptions: A single period means that market makers cannot learn from observed past orders and prices, but the effect of insiders in this model is also limited due to the single-trade condition. If we relax this restriction, insiders will take all the trading opportunities the MM provides them. So if we relax this assumption $q \rightarrow 1$ and $s \rightarrow (VH - VL)$.

Texas Gulf Sulphur Company

Discovered very worthy land. Employees were told not to share findings until the land was bought. The finding was announced much later, but the share price of the company had already increased drastically. → **rule of disclose or abstain**, which applies even to non-directors, including people outside the company who became aware of information - insider must disclose such information before trading, or if disclosure be impossible or improper must abstain from trading in that stock

Glosten and Milgrom (1985) Model

Assumption of a single trading period very restrictive: in practice market makers can learn from the orders they see coming in and can then adjust the price. When there are a lot of buy orders: update (increase) the subjective probability p that the value is VH . When there are lots of sell order: update (decrease) the subjective probability p that the value is VH .

Effect of inside traders on price development

The more inside traders, the bigger the bid-ask spread. But also the bigger the 'jumps' towards the true value, i.e. the quicker the market converges to the true equilibrium price.

Should insider trading be illegal?

Thinking of it according to the two models: In the Copeland and Galai model insider traders are very costly, increasing the spread for liquidity traders, likely pricing some liquidity traders out of the market. Especially in the case of trades in small companies, where liquidity trades are less frequent, asymmetric information is larger, and thus insiders can play a larger role. But in the Glosten and Milgrom model they also ensure that the market price reflects information about the fundamental value of the underlying asset. In practice regulators have to balance these two features. One perspective is that for short-term, high volatility situations (e.g. take-over rumors), insider trading is mostly costly, while providing little benefit. Over the long term the benefit of insiders pushing prices closer to fundamental values may outweigh the cost.

Insider regulation

One problem with insider regulation is that it's difficult to prove that you were the specific victim of an insider trader. Therefore it is mostly dealt with through criminal rather than civil law. In the US, the SEC has the power to bring a civil suit against insiders on behalf of investors, and if you can show you were trading around the time the insider trading happened, you can become party to the suit.

Everyone can be an insider nowadays, so insiders are regulated more and more over time. The most obvious candidate for insider traders are directors and employees of a firm.

Rozeff and Zaman (1988) show that it is possible for outsiders to earn abnormal returns by copying the trades of insiders. Givoly and Palmon (1985) even suggest that insiders actually earn more money due to the market reaction to their disclosed trades, than due to the inside information itself.

Insiders can't disclose information to selective parties. Insiders are barred from trading in any relevant securities. You are also barred from tipping. You are not allowed to directly or indirectly communicate the information to any other person if you know or should know that the other person could or would be likely to trade on this information.

Chinese walls

Generally directors of a firm are considered insiders to all information in the firm, unless strict Chinese Walls are in place. A separation between separate departments of a firm such that information cannot flow from one side to the other.

Regulation (or reg FD). Limits especially selective disclosure to large Insider regulation in the US

The first federal regulation came with the SEC act of 1934. It wasn't very specific about what's an insider, what is a manipulative or deceptive device, etc. All additional regulation came from jurisprudence and SEC rule making, but it was quite limited in scope. Mostly only directors had to prove intent and actual fraud.

In the 1980 a lot of insider trading scandals (See Ivan Boesky), resulted in the Insider Trade Sanction Act (1984). Imposing treble damages and increasing the maximum fine. In 1988 a maximum jail time of 10 years and a fine of \$1 million was established. Rules on selective disclosure got tightened in 2000 with the Fair Disclosure shareholders, chosen analysts.

EU: Market Abuse Directive 2014/57/EU

EU mirrors the SEC policy: It is illegal to trade on material non-public information, or to communicate it with others. Issuers of financial instruments have to reveal relevant material information as soon as possible (unless against 'legitimate interests'). Also have to immediately publish changes to previous disclosures. Firms can't disclose information to selective parties, unless for professional purposes to persons owing a duty of confidence to the company.

The AFM distinguishes between primary insiders and secondary insiders. Primary insiders are all people presumed to have knowledge of relevant material non-public info. The actual knowledge doesn't need to be proven. People like directors, accountants etc.

Secondary insiders applies to anyone else that learned about the information and traded afterwards. The AFM needs to prove you did acquire this information.

Lecture 8: Market for Control

Shareholder problems

Passive shareholders give money to people who promise to do something in the future, but you don't know if they will work on behalf of you → basic problem of corporate governance:

how to overcome agency problems between shareholders and management. Management can run away with your money literally (pyramid schemes) or via transfer pricing.

Agency problems

Theoretically, a complete contract would solve the agency problem. However, this is impossible to make. The reason for this being that you can e.g. not foresee every scenario and that courts rarely get involved with “business decisions”.

CEO misbehavior I: Perks

Perks: non-monetary compensation, not strictly necessary for the accomplishment of the employee’s duties.

- can be seen as pure reduction firms value → management owns larger share → less perks
- can be seen as tax-efficient way of paying management
- many perks might be useful to the firm, private plane may e.g. be more efficient than commercial flying

However, firms with high perks underperform the market.

CEO misbehaviour II: Empire building

Big firms are good for CEOs ego, but the pay of a CEO is often also linked to company size. Remuneration committee looks at comparable sized companies → incentive for CEO to expand rapidly.

An example is Hope and Thomas (2007) look at profitability after a new disclosure regulation where firms no longer had to disclose separate earnings by geographic location, e.g. net profits in Mexico, net profits in Canada, etc. They find that after the regulation went into effect nondisclosures have a greater expansion of foreign sales, lower profit margins and lower firm value.

Expanding can also be done with aggressive acquisition policy. However, acquisition often not good for wealth of buying company, especially if the buyer is a big company.

CEO misbehavior III: Pet projects

This comes down to CEO’s investing in their own favorite ‘pet project’. They can also use this for entrenchment: makes it harder to replace CEO, because this CEO adds value in this specific project.

CEO Misbehavior IV: Corporate philanthropy

CEOs can get pretty busy with corporate philanthropy and their pet charities (Barnard, 1997).

Difficulties of monitoring and dispersed ownership

Dispersed ownership, results often in low monitoring, because not one person that owns the company. **Free riding** is also a problem: most shareholders rely on others to do the monitoring for you.

Disciplinary takeovers

Disciplinary takeovers take place, due to existing management not maximizing shareholder value. The takeover could be worth it, just because of replacing inefficient management. Usually these are hostile takeovers, it's against the will of the company's management.

Grossman and Hart model (1980)

Disciplinary takeovers hard in practice → too little takeovers → regulation should stimulate

V = value bidder believes share price could be

Q = current share price

C = cost of takeover per share (advisory services, integration costs, etc.)

Price max willing to pay = $V - C$

So bidder submits tender offer (public solicitation to shareholders requesting they can sell shares for (often a higher) price than current price)

Tender offer: $Q < P < V - C$

→ shareholder collective action problem:

Collectively shareholders would be better off selling for P (if bid fails value will continue to be Q).

Individually shareholders shouldn't accept, if they wait their shares will be worth V!

Unconditional offer: buy shares if people accept the bid, however when you approach the 50%, people will believe it will not fail and not sell for less than V.

Conditional offer

Bidder will only actually buy the shares if at least 50% are offered in the tender offer.

Combined with Mandatory Buyout Rule: if acquire >90% buy out remaining shareholders for same price you paid the rest. What will shareholders do now?

- If bid fails, you would be no worse off not having offered your share
- Acquires 50-90%, better off not having offered share → $V = 11$
- Acquires >90%, not worse off if you did not offer share
- → Do not sell

Toeholds

Bidder doesn't announce but starts buying up shares silently in open market:

- Prices pushed up a bit towards $T \geq Q$
- Acquires fraction x of outstanding shares at price T , then bid at full valuation V .
- If bidder makes enough profit $V - T$ on x toehold shares, can recover cost and the Grossman-Hart problem is solved
 - $X(V - T) \geq C$

Regulatory toeholds

Thus, regulators should set toehold limit x high enough to encourage takeovers. However this creates unfair treatment; some are lucky others are not. Besides insiders will also buy shares, so demand goes up and price might go up quicker as well.

So, regulators balance between cost of unlucky shareholders and cost of inefficient management. Toehold limits US 5%, 3% NL, thus quite low.

Bad side takeovers

Takeovers can also create private value, but destroy social value. There can be a transfer in wealth from stakeholders (employees) to shareholders. Moreover, there can also be negative external effects. Like stopping to buy from a certain supplier that dominates local economy of small town → bankruptcies in that town.

Implicit contracts

The relationship between management and stakeholder relies a lot on so-called implicit contracts. It is difficult to write down exactly in a contract what any employee should do, and what will be the long term rewards. Implicit contracts are often long-term and rely on trust: suppliers making firm-specific investment, employees learning firm-specific skills in return for long term employment/business. Often tempting to cancel implicit contracts ex post. Thus management and shareholders must be trusted by stakeholders in order to make long-term firm-specific investments. Long term relationships develop. Relationships that management is often not willing to breach.

Implicit contracts and takeovers

The bidder can realize a takeover premium by being willing to breach implicit contracts. E.g. lowering wages, forcing lower prices on suppliers. A large part of takeover premia may represent transfers from stakeholders to shareholders. The disruption cost may well exceed the social benefit.

→ long-term implicit contracts only committed in a world where stakeholders trust management, and takeovers are thus not too constant → uncertainty

Thus, **hard for regulator to choose between making takeovers easier/harder!**

Management reaction

Some argue that management should leave the decision to shareholders. Others argue that resisting management can raise the share price in the interest of shareholders. Different tactics for resisting to the takeover are:

- White knights: management should know valuation better, can organize a white knight: rival investor likely to be friendly to existing management
 - Bidder underestimated true value → lose bidding war with White Knight
 - Bidder overestimated true value → win bidding war, but overpay
 - → can scare of potential bidders
 - Lady Macbeth: parties can pose as white knight, but turn and support bidder
- Poison pills
 - Management hands out securities that will give the holder a right to buy additional shares at a discount, if some % of company gets acquired → thins share of bidder
- Shark repellent
 - Generic name rules that make it harder to replace existing boards or hold shareholder meetings
 - Examples: staggered boards, can only replace part of the board at a time

- Greenmail: paying potential acquirer to leave you alone → buy back toehold at a premium
- Pac man: turn around and try to take over firm trying to take them over
- Scorched earth policy: firm sells off most valuable assets to discourage takeover bid
- Golden parachutes: large severance packages for top management make takeover more expensive, although they might accept offer more quickly now
- Leveraged recapitalization: firm takes on additional debt to make dividend payments, making it less attractive

Effectiveness of takeover defences

Most takeovers fail.

- So there is some support for the notion that takeover defence strategies make management more entrenched, hurting shareholders (as in Byrd and Stammerjohan, 1997)
- On the other hand when the bid does finally succeed they can force the bidder into paying much higher premiums, benefiting shareholders (DeAngelo and Rice, 1983)

US Takeover Law: Williams Act (1968)

Aim of this act was to prevent lightning fast take over, by more disclosure by bidding company and a longer tender period. Target management has to file an official recommendation to shareholders with the SEC. The bidder has to accept all shares offered and pay the same uniform price for all.

EU Takeover Directive (2004)

Equal treatment all shareholders. Tender offers open for 2-10 weeks. Board neutrality rule: post-bid takeover defences forbidden without shareholder permission. Board can however look for white knights and can recommend shareholder.

Regulation in the Netherlands

Toehold disclosure rule: Shareholders owning more than 3% of issued capital in a company have to report to the AFM without delay.

Mandatory bids: Any entity, alone or in concert, owning more than 30% of the target's voting shares, has to make a mandatory bid for the company. The offer has to be at an "equitable price". This is the highest price paid by the bidder in the past year.

Certainty of funds: a bidder has to prove that it has the necessary funds, which could be cash or equity, to pull off the acquisition offer.

The target's board has to organize a shareholders meeting at the latest 6 days before the end of the offer period.

The board has to make known its recommendation to the shareholders at least four days before the meeting.

For bids for the entire company, the minimal offer period is 8 weeks, the maximum is 10 weeks.

Put up or shut up rule: A target company can ask the AFM to force a potential bidder to either make a bid, or abstain. If the potential bidder doesn't make a bid, it is forbidden from making a bid for the next six months, and is not allowed to hold more than 30% of the shares.

Lecture 9: Bank capital and liquidity requirements and risk management

Bank capital and need for capital adequacy standard

Bank balance sheets highly leveraged: liabilities consist almost entirely of debt, and low equity. Capital has a higher cost, because capital holders have higher risk of suffering a loss than debt holders! → when a bank fails, bondholders paid back first, shareholders are the last.

Bankers have limited liability and a short-term compensation structure, which causes incentives to maximize leverage.

Regulatory capital is what a bank is required to hold against potential unexpected losses. Works as a buffer to absorb losses and as a risk charge by disincentivizing taking of excessive risks and internalizing social cost of risk-taking.

Basel I (1988)

Risk-based capital approach:

- Capital is risk weighted
 - Each asset has a risk weight, multiply value asset with risk weight and you get the risk weighted asset, e.g. asset 10mln * risk weight 50% = RWA 5mln
 - Capital ratio sets amount of capital needed to hold for RWA e.g. 8% capital ratio * 5mln = 0.4 mln
 - higher risk asset → more capital has to be held against it
- To increase comparability, risk-sensitivity and promote low-risk assets/investment

Regulatory capital can be sourced from different tiers:

- Tier 1 (core capital) = shareholder equity
- Tier 2 (supplementary capital) = long-term debt and limited to 100% of tier 1

Problems of Basel I:

- Capital requirements applied only to loans on banks' balance sheet → growth of securitization and credit derivatives markets
- Favouring short term lending to banks → increase of ST loans to banks developing countries
- Applied only to banks' loan books initially, not other risky areas like trading securities for clients or to proprietary trading (invest for own direct market gain)

Market Risk Amendment (1996)

Capital requirements now also included a bank's market risk (trading book) exposures. Also allowed banks to use **own data and models** as basis for calculating regulatory capital for trading book.

Basel II (2005)

Three pillars.

Pillar 1: Rules-based: minimum capital requirements

Regulatory capital requirement = credit risk + market risk + operational risk

- Credit risk measured either through:

- standardized regulatory risk weights and external ratings, expanded use since Basel I, more parameters (maturity, probability default, bank's loss and exposure given default)
- internal risk models

Internal risk models led to an uneven playing field: small banks didn't have enough data and couldn't optimize, big banks could optimize capital requirements through own data and models.

- Market risk
 - Typically **value-at-risk models**, looking at historical variations in asset prices → misleading, due to low volatility before crisis
 - Internal model or standardized approach with 5 market risk-weighted categories like foreign exchange risk, interest rate risk, etc.
- Operational risk: risk associated with overall operations, not specific ones

Pillar 2: Principles-based: supervisory review

- Supervisory review of capital adequacy as complement to first pillar
- Introduction of ICAAP (internal capital adequacy assessment process): bank internal process is subject to supervisory review and intervention
 - 4 elements: assessment risks, application risk mitigation techniques, stress-testing and role of board of directors and management

Pillar 3: Market-based: Market discipline

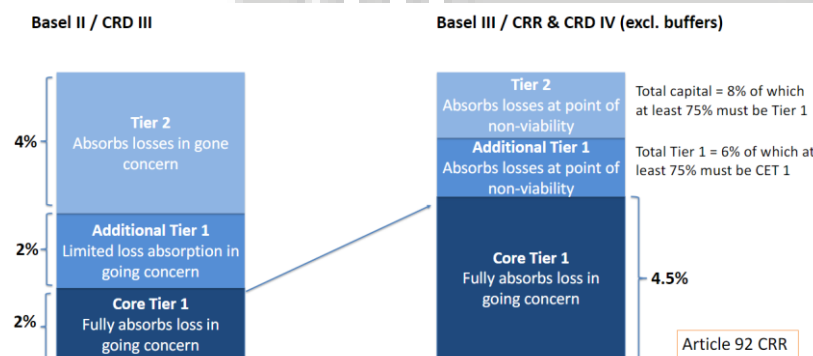
About external communication of risk and capital information by banks. Defines disclosure requirements → transparency and assessable for market participants.

Basel III (2010)

Reactions to lessons learned from financial crisis 2007-2009:

- Dependency external ratings → procyclicality; good times, less risk → banks have to hold less capital when crisis strikes
- Large banks heavily leveraged
- Liquidity shocks → even trouble for well-capitalized banks
- Systemic risk not taken into account by interconnectedness

Basel III enhances the Basel accord, but cornerstones of Basel II stay in place.



The total capital ratio of 8% was held, but the distribution changed. Relatively more tier 1 and less additional tier 1 and tier 2 needed.

Also, **capital buffers** were introduced. Raise buffers in good times (on top of regulatory minimum), these can be drawn down, but that results in restraints (on distribution capital, dividends and bonus payment to employees) → aim is to ensure shareholders bear the risk the stresses.

- G-SIFI Surcharge: based on banks that impose most systemic risk
- G-SIBs: indicator-based measurement approach to rank banks on systemically importance → more important, higher buffer
- Countercyclical buffer 0-2.5%, no problem if empty in stressed times
- Supervisor can impose additional requirements and more **stress-testing** is done (stronger governance dimension)

Leverage ratio = capital measure (Tier 1 capital)/exposure measure
- 3% minimum requirement → backstop to risk-based capital requirements

Also **liquidity requirements** were added.

- Liquidity Coverage Ratio (LCR) = high quality liquid assets / total net cash outflows over 30 days
 - Has to be > 100%, so be able to pay assets over 30 days
- Net Stable Funding Ratio (NSFR) = available amount of stable funding/required amount of stable funding
 - Has to be > 100%
 - To promote long-term stability by stable funding over one-year horizon

Basel III.5 reforms

Ensured output floor: RWA by internal models at least 72.5% of RWA by standardized approach. Also some revision to the standardized approach for credit risk and the measurement of the leverage ratio.

Lecture 10: Bank resolution, state aid and deposit insurance

Resolution

Resolution is helping a failing bank. It is important to know what to do when a bank fails due to several reasons:

- Big social impact bank failure (systemic risks)
 - Spillovers and bank runs
- Bail-out and moral hazard problem: no subsidization of bank failures

We cannot just have insolvency laws, because judicial authorities are too slow, critical functions might (bank's payment system) be abruptly stopped, going concern value might be destroyed.

International standards: FSB Key Attributes (2011)

Comes down to way more attention to **resolution planning**: preparation for what happens when a bank has to be resolved. Because a resolution has to be in a resolution weekend of ~36 hours. The general strategy of resolution planning: understand bank, preferred resolution strategy, financial and operational continuity in resolution, information and

communication plan, resolvability assessment. In the resolution scheme the regulators look at the resolution tools and how to finance the resolution action.

Some key attributes:

KA1 Scope: All financial institutions that could be systemically significant or critical.

KA2 Resolution authority: specifies the administrative authority to exercise resolution powers and their objectives.

KA3 Resolution powers: Specifies when a firm enters into resolution, gives the general powers (remove/replace management, override shareholders' rights..) and the tools

KA5 Safeguards: respect creditor hierarchy 'no creditors worse off than in liquidation'

KA6 Funding of firms in resolution: how to fund, strict conditions to minimize moral hazard and recovery of losses from uninsured creditors and, if necessary, from industry

KA10 Resolvability assessments: regularly evaluate feasibility and credibility of resolution strategies

KA11 Recovery and resolution planning: recovery and resolution plans and that they require regular updates

Strategies of banking group resolution

Two strategies possible for group resolution. These are strategies to deal with cross-border banking groups.

Single Point of Entry (SPE): resolution action applies to single entity at top of banking group. The resolution goes through the whole group. We do not artificially separate the group, but keep it as a whole → restructure in terms of shareholders and creditor base. Here the group's home authority is responsible for executing the resolution strategy.

Advantage: group does not fall apart, do not artificially separate but keep it as a whole!

Multiple Point of Entry (MPE): the group is taken apart, each with its own proceedings. Multiple resolution authorities are in charge of executing the resolution. There is risk of subsidiaries suffering losses and competitive resolution/insolvency and ring-fencing (local authorities have the bias that own creditors should get as much out of resolution as possible).

Disadvantage: banking group taken apart, no longer banking group.

SPE is preferred by home countries to large global banking groups. MPE often chosen for banks that are not too integrated.

TLAC: Total loss-absorbing capacity

TLAC applies to Global Systemically Important Banks (G-SIBs). It's an addition to Basel III capital requirements. Difference with capital requirement is that TLAC takes into account funding needed during the resolution period.

BRRD: Bank Recovery and Resolution Directive

The BRRD applies to all 27 EU member states. Scope identical to the Capital Requirements Directive: credit institutions, financial groups and certain investment firms. Member states must designate a resolution authority with a set of minimum resolution tools: sale of business tool, asset separation tool, bridge institution tool and bail-in tool.

BRRD is a directive. SRMR is a regulation. Single Resolution Mechanism introduced uniform institutional resolution regime for euro area, but powers conferred upon by the BRRD do still apply!

BRRD/SRMR

Mainly about planning: to gain understanding of banks, identify and address impediments to resolvability and be prepared for resolution weekend. The plan has to be reviewed (and updated) at least annually and after material changes.

Resolution planning process in practice

1. Strategic business analysis: Description of the bank's structure, financial position, business model, critical functions, core business lines etc.
2. Preferred resolution strategy: Normal insolvency proceeding or resolution? Which resolution tools and powers?
3. Financial and operational continuity in resolution: Assessment of prerequisites to continuity in resolution.
4. Information and communication plan.
5. Conclusion of the **resolvability assessment**: Identifies impediments to resolution and measures to address them; determines **MREL**.
6. Opinion of the bank in relation to the resolution plan.

The resolvability assessment is about the feasibility and credibility of liquidation/resolution without significant adverse consequences for the financial system and interrupting critical functions. Resolution authorities have a lot of power to address identified impediments, like structural measures, financial measures and information requirements.

MREL (Minimum Requirements for Own Funds and Eligible Liabilities) is the European equivalent to TLAC. Different from TLAC, because it applies to all European banks and is determined for each bank/group individually.

Conditions for resolution

There is a 3 step process before a resolution will happen, if condition 3 not fulfilled → normal national insolvency proceeding.

1. The supervisory authority (ECB) determines that the bank is failing/in the process of being likely to fail
2. The resolution authority (SRB) cannot find an alternative measure that solves the issues.
3. The resolution authority assesses whether it is necessary in the public interest → this, however is judgement, there is no clear threshold!

Tools

- Sale of business tool
 - Disattach good part (deposits & liquid assets) and sell to private buyer

Lecture 11: Sustainable Finance

“Sustainable finance refers to the process of taking environmental, social and governance (ESG) considerations into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects.”
(European Commission)

Financial institutions as facilitators of the greening of the economy: they could make lending cheaper for green activities and more expensive for brown activities. They could also make more investment in green bonds.

Financial institutions are themselves subject to risks generated by climate change.

The root issue is that environmental sustainability is about way more than climate risk only. It is about all man-made environmental risks identified by some as the nine planetary boundaries. Breach of one of those could undermine safe space for development of humanity.

Finance in the sustainability agenda

Sustainable development goals cover three pillars of sustainability, ESG: environmental, social and governance. In the Paris Agreement on Climate Change (2015) was acknowledged that the financial sector has a central role in the transition to an environmentally sustainable economy. The change for transition cannot be paid by just tax money!

Sustainable investment

Investment is sustainable when:

- Environmental considerations: climate change mitigation, e.g. prevention of pollution
- Social considerations: leading to more equality, investment in human rights
- Governance considerations: management structures, employee relations and executive remuneration

Environmental and social considerations often interconnected. Governance plays a fundamental role in the decision-making process of institutions.

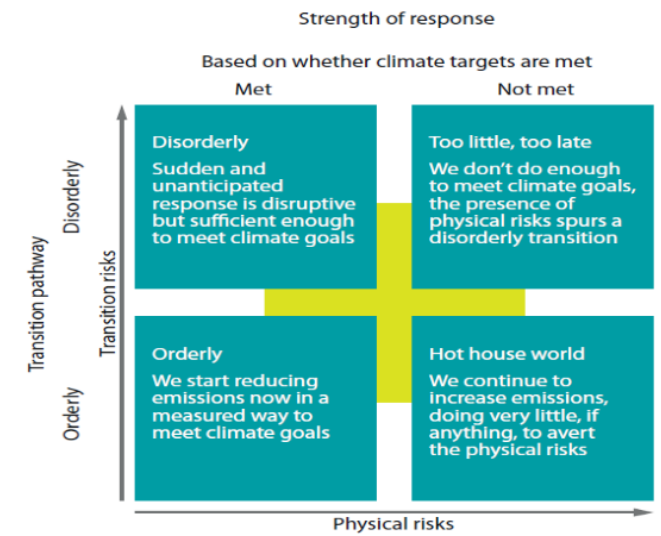
However, it is difficult for investors to verify whether an investment is truly sustainable! Limited disclosure of carbon footprint and lack of understanding for when an investment is qualified as sustainable.

Climate change as a source of financial risk

Sources of risk: **physical risks** are extreme weather events, changes in climate patterns.

Transition risks are changes in policy, technology, consumer preference. Thus transition risks are not directly linked to climate change, but indirectly affected. E.g. no leather shoes bought anymore.

In the figure below, we think in four different scenarios. The risks on the x- and y-axis.



Market failures in reducing exposure to risks

1. Mispricing of risks (over- and underestimation of risk)
2. Asymmetric information (data gaps)
3. Financial stability is a public good
4. "Tragedy of the Horizons": focus on short-term, not long run
 - a. Business, political cycle too short → mismatch between need for policy measures now to mitigate impact of climate change in long run...

Role banking sector

Banks are key facilitators of the transition, since they can mobilize and reallocate capital via channeling funds into "green" investment/sectors. Banks themselves are exposed to significant financial risks caused by climate change.

Central banks

Central banks can either have an activist approach or a passive approach.

The **activists** say that currently the central banks monetary policy works in favor of climate change. CB's buy bonds and capital intensive corporations are tech, oil, cars etc. Therefore, the portfolio of the CB is really brown, and way more brown than the average in the market. Therefore, activists say that the central bank should at least be neutral.

The **passivists** say that maintaining stable nominal prices is the best the central bank can do to support the low-carbon transition. They argue that CB's should separate themselves from politics and take a neutral stance towards markets.

The ECB stated that it **has** a role on sustainability next to price stability.

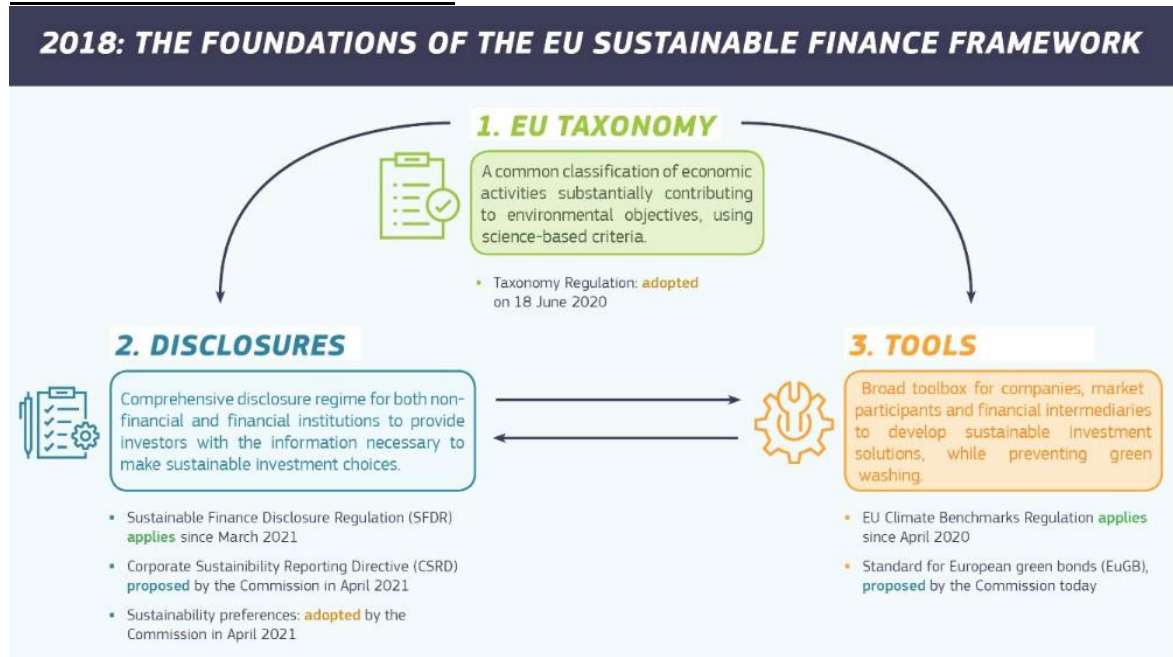
Commission Sustainable Finance Action Plan (2018)

Aims and concrete actions:

- Redirect capital flows towards a more sustainable economy
 - Classification and standards
- Mainstreaming sustainability in risk management

- E.g. integration of sustainability ratings
- Foster transparency and long-termism

EU sustainable finance framework



There are three main areas of regulatory action needed:

1. Definition/classification of green/brown investment → **Taxonomy Regulation**
2. Sustainability transparency through disclosure → Disclosure Regulation
3. Prudential treatment of sustainable risks → inclusion in Basel III/CRR/CRD framework?

Taxonomy regulation

Currently only the E of ESG is considered. We need a shared understanding of 'sustainable'. The purpose is to establish uniform criteria for determining whether an economic activity/investment is environmentally sustainable.

There are three conditions after which something will be sustainable:

1. Significant contribution to at least one environmental objective
2. No significant harm to any other environmental objective
 - a. Significance is defined by scientists
3. Compliance with certain social minimum safeguards → S from ESG

Activities are also classified:

- Sustainable ("dark green") activities: activity in and of itself produces very small or no GHG emissions, e.g. forestation
- Enabling activities: activity directly enables other activities to contribute to environmental objectives, e.g. manufacturing windmills
- Transition activities: activity supports transition to climate-neutral economy and no feasible low-carbon alternative, e.g. production of cement and steel

Sustainable Finance Disclosure Regulation

Disclosure is a regulatory tool that can support market discipline. Most rules apply since March 2021.

The aim of the regulation is to get harmonized rules for financial market participants and financial advisors on transparency. Transparency is about integration of sustainability risks and consideration of adverse sustainability impacts.

Regulation → enhance comparability.

Prudential treatment of sustainability risks

3 pillars added to Basel III:

- minimum capital requirements → add: green supporting factor/brown penalty factor
- supervisory review process → add: incorporation of ESG risks (e.g. stress test climate shock)
- market discipline → add: ESG disclosure

Lecture 12: Convex incentives and Excessive risk

If someone has to invest himself, he will often invest not too risky. However, people investing for others, gaining some part of the return, have basically only upside potential, and will therefore invest way riskier!

Managers often get options, this also incentivizes high risk taking.

Basic Principal-Agent theory

Principal-agent theory tells us that we want to incentivize manager to put in effort, but we cannot directly observe that effort/cost of monitoring would be too high. The manager would prefer putting in less effort and doing stuff he likes. The Principal can observe output (profits)

Higher effort e generally results in higher output, however there is also a random factor c determining output! $Y = e + c$

Optimally you would only pay on effort, not on luck. However, compensation is often not indexed to average performance and options are often reset when share prices decline to keep incentivizing.

Contracts

If manager is risk-averse he would rather receive a fixed wage than a variable wage with the same expected value. Disutility (cost) from effort is convex and increasing in effort e : the more effort, the more you want to spend time in other ways, e.g. going to a bar.

Holmström (1979) showed that the optimal incentive-compatible contract would be a compensation rule $w(y)$ depending output y such that:

- Managers accepts the offer: participation constraint: $E U_{\text{manager}} \leq U_{\text{bar}}$
- Manager prefers to put in high effort rather than low

→ there should be a fixed part, high enough that the agent accepts the contract (participation constraint) and a variable part (to induce high effort)

But, what if manager can choose variance of outcome distribution next to effort e ?
→ value of a convex payoff function (e.g. call option) increases with more volatility
This is a problem when the person on the receiving end of the convex payoff function can influence riskiness.

Financial incentives and convexity

Most convex incentives have mostly (only) upside potential and very little downside. In short-term this results in receiving a bonus when outperforming and little/no malus when underperforming. Besides, bonuses are rarely taken back.
In longer-term also limited downside (call options or share price that cannot go below zero).

Fund management

Fund managers often 2/20% rule. Fees 2% of assets under management plus 20% of excess returns → rewards gain, losses not punished. However, if assets under management grow, the 2% becomes bigger.
Fund inflows depend on previous year's performance → more risk in 2nd half year if first half underperformed. This in turn, drops performance often even more.

In US banks have increasingly used employee option-based compensation and this has induced risk-taking.

Optimal contract

- Attracts and retains high quality executives
- Provides executive with incentives to provide sufficient effort
- Provides incentives to take decision in shareholders' interest
- Minimizes overall cost

Mechanisms that assure optimal contracts are **arms length boards**: boards not influence by management and **constraining market forces**: firms without optimal contracts go out of business.

However, boards often not independent and they are often executives themselves, benefiting from executive rewarding.

Shareholders have very limited power in showing that a board did not act independently.

Managerial power approach

Expect compensation packages depend on CEO power:

- Number of shares owned by CEO (more influence over board member elections, and takeovers less likely)
- Ratio independent vs inside board members
- Number of board members that CEO shares personal affinity with

However, there is a limiting factor to executive packages: **public outrage**. Firms that experience negative publicity surrounding compensation practices experienced smaller increases in compensation than other firms in the next years.

→ camouflage: hire compensation consultant, they make decision, they are responsible (blame shifting)

Clawbacks

Clawback provisions: taking money back. This is usually tied to fraud, but sometimes to performance. This decreases short-termism.

TARP regulations

Troubled Assets Relief Programme. Reaction to banks being bailed out by taxpayers continuing to pay large bonuses. The bailout came with restrictions:

Only base wage and restricted shares allowed as compensation. When this passed the congress in little to no time, the Treasury loans were repaid...

EU regulation

Limited ratio of variable-to-fixed remuneration to 1:1, 2:1 if super majority shareholders approves. Up to 100% of variable pay must be subject to clawback.

Rules showed effectiveness: relatively more fixed remuneration.

In the Netherlands the restriction is 1:5 ratio. Bonuses not allowed to exceed 20% of fixed wage.

Lecture 13: Bank Runs

The problem with banks

“The money isn’t in the bank”. This means that the money is in long-term illiquid assets, for example mortgages, business loans, etc. While the liabilities (deposits) are short-term and liquid liabilities (deposits can be withdrawn overnight). This is called “maturity mismatch”: the maturities of assets (long-term) and liabilities (short-term) do not match. So the depositors can withdraw their money overnight, while the bank’s loan portfolio will only be paid back in the next 30 years. They could try to recall the loan, or sell it to another bank, but unlikely to get the full face value of the loan: the cost of liquidation.

The Diamond-Dybvig (1983) model

The fundamental issue in the model is that banks invest in illiquid assets with a high long run return R and a high cost of liquidation. Banks take deposits that offer a lower return and low cost of liquidation (overnight). The model uses a simple 2 depositor type, 2 period model to generate a lot of insights: For every bank there is both a healthy equilibrium and a bank run equilibrium. It’s impossible to predict which equilibrium will actually play out. Hence: every bank is always at risk of a bank run, no matter how healthy the bank is: inherent instability of the banking system.

Liquidity

It is difficult to know beforehand when you will need cash. Example in class: What if your favourite DJ is coming to town this weekend, but you had lent your money to a local banker that will only pay back (with interest) next year? Ideally you would invest in high return, highly liquid assets: assets that have little penalty for withdrawing early. One of the basic functions of banks is to "create liquidity": they offer deposits that are more liquid than the underlying assets ("liquidity transformation").

Diamond and Dybvig - Depositors

The stylized model only concerns three dates: $T = 0$, $T = 1$ and $T = 2$. There are two types of depositors: early consumers and late consumers: Early consumers (or "type 1") need cash at date $T = 1$. So early consumers have to withdraw their money at time $T = 1$. Late consumers (or "type 2") need cash at date $T = 2$. Late consumers can either withdraw at time $T = 2$ (and hopefully get a higher return), or withdraw at time $T = 1$ and store the cash under their mattress until the next period. At date $T = 0$ the depositors do not yet know whether they will be an early or late consumer, only the probability λ of being an early consumer.

Bank liquidity creation

A bank takes 100 depositors that deposit \$1 each, and invests in illiquid assets with high returns ($r_1 = 1$, $r_2 = R = 2$). (high expected return in period 2, but big cost of liquidation in period 1). Then the bank promises depositors $r_1 = 1.28$ for withdrawals in $T = 1$, and $r_2 = 1.813$ for withdrawals in $T = 2$: So the bank offers a deposit contract that is more liquid than the underlying assets.

$\lambda = 0.25$, so out of 100 depositors 25 will withdraw at $T = 1$ and withdraw $\$1.28 \cdot 25 = \32 in total. So the bank liquidates 32 assets at a return of $r_1 = 1$ to pay out the early consumers. This leaves $100 - 32 = 68$ assets remaining that will have a return of $r_2 = 2$ in period $T = 2$. So there will be $(100 - 32) \cdot \$2 = \136 left for withdrawers in $T = 2$.

Since there are 75 ($= (1 - \lambda) * 100$) late withdrawers, they will receive $r_2 = 136 / 75 = 1.813$ each. 13/38

Liquidity transformation

Thus by pooling the deposits, the bank is able to use the returns ($r_2 = R = 2$) of the illiquid long-run asset to offer a more liquid ($r_1 = 1.28$, $r_2 = 1.81$) deposit contract to consumers.

This liquidity transformation is one of the most important functions of banks

The liquidity transformations allows consumers to participate in the higher returns of investments, while still having daily access to their deposits.

Depositor preference for liquidity

The depositor could either invest in the illiquid asset ($r_1 = 1$, $r_2 = R$) themselves or put money in the bank for a more liquid return ($r_1 > 1$, $r_2 < R$). Suppose again that $\lambda = 0.25$, the illiquid asset has ($r_1 = 1$, $r_2 = 2$) and the illiquid asset has ($r_1 = 1.28$, $r_2 = 1.813$), then:

$$EU = \frac{1}{4}U(1) + \frac{3}{4}U(2) = 0.375$$

$$EU = \frac{1}{4}U(1.28) + \frac{3}{4}U(1.813) = 0.391 > 0.375$$

More general

The return r_2 available for depositors in $T = 2$ depends on the number withdrawals λ in $T = 1$, the return r_1 offered to early withdrawals, and the return R of the illiquid assets in $T = 2$:

$$r_2 = \frac{(1 - \lambda)r_1 R}{1 - \lambda}$$

If banks are competitive, they will compete to maximize depositor's utility.

Thus the winning bank will set r_1 and r_2 in order to optimize:

$$\max_{r_1} \lambda U(r_1) + (1 - \lambda)U\left(\frac{(1 - \lambda)r_1 R}{1 - \lambda}\right)$$

Watch the lecture for more information about the calculations.

But what if there are too many early withdrawals?

So far, the banks are working as they should in this model: provide liquidity transformation. The problem is that although only λ withdrawers are expected to withdraw in $T = 1$, but according to the deposit contract, in theory everybody could withdraw.

Also the return r_2 depends on the number of people actually withdrawing in $T = 1$. The only thing that is keeping late consumers from withdrawing in $T = 1$ is that they trust that there will be enough money left in $T = 2$ such that $r_2 > r_1$.

Thus if late consumers do not trust that there will be enough assets left at time $T = 2$, they will also want to withdraw at time $T = 1$ and simply store the cash under their mattress until $T = 2$. So if the late types believe (for whatever reason) there will be a lot of withdrawals at time $T = 1$, then they will want to withdraw early at time $T = 1$ as well.

Bank Run Equilibrium

Bank run equilibrium: Late types believe that more than λ types will withdraw in $T = 1$, so everybody tries to withdraw at the same time. In this case the bank should allow all its customers to withdraw $r_1 > 1$ but even if the bank liquidates all its assets, there will only be $r_1 = 1$ available in $T = 1$. Thus either customers are only able to withdraw a fraction of the money they were promised, or only the first that come to the bank will get their money, and everybody that is too late will get nothing. The result of this will be that everybody starts queueing up at the bank to get their money out as soon as possible and you get a classic bank run.

Equilibrium selection: only beliefs matter

The only thing determining whether you stay in the good equilibrium or end up in the bad equilibrium is your beliefs about other depositors' beliefs about other depositors' beliefs. Fundamental solvency of the bank does not matter. Your own beliefs about the solvency of the bank do not matter. Only your beliefs about the number of others that believe a bank run

might happen determines your belief about λ and so the equilibrium you end in. However beliefs can turn on a dime. Any false rumour can start a bank run even at a healthy bank.

Banks are inherently unstable

The dark conclusion of the DD model: banks that offer liquidity transformation through maturity transformation are inherently unstable. There is always a good equilibrium and a bad equilibrium. And there is no game theoretic reason that makes one equilibrium more likely than the other! Beliefs are not pinned down by the model itself.

Remedy 1: Suspension of Convertibility

Suspension of Convertibility: If the bank commits to not allow more than λ deposit withdrawals in $T = 1$, type 2 depositors always know they will be able to get r_2 , so a run would never start. Thus the suspension never actually needs to be carried out. In the 19th century banks regularly limited withdrawals during banking crisis. Recently withdrawals were limited in Greece and Cyprus during their financial crises.

A problem occurring when announcing suspension of convertibility is that it can trigger panic. Doubts about the health of the banking system can increase, and confidence that others would not run decreases. So Suspension of Convertibility may result in a self-fulfilling prophecy.

Remedy 2: Lender of last resort

When the bank is not insolvent, just illiquid, a Lender of Last Resort can extend liquidity to the bank at face value of the assets (R). If the bank can get a loan from somewhere to cover the excess withdrawals in $T = 1$ without having to liquidate its assets, the high return R on the assets in $T = 2$ should be enough to pay back the loan. But only works if someone is brave and large enough to extend such liquidity in time of crisis, and is confident that the bank is illiquid not insolvent (i.e. the return R has not been compromised).

Banking panics in the US

In the UK, the last real massive banking panic happened in 1866, thanks to the Bank of England acting as a credible LLR. However, the US did not have a central bank after President Jackson did not renew the license of the Second Bank of the United States in 1836. This results in many banking panics.

Remedy 3: Bank holiday

Another way of dealing with a banking panic is to simply close down all the banks. It can allow panic to subside, while banks have time to prove they are not insolvent, shore up finances. On the other hand as the others it can cause panics.

Remedy 4: Deposit Insurance

By insuring deposits bank runs can also be limited. If late consumers know that their deposit are insured such that they would receive r_2 from the deposit insurance fund even if the bank fails, they no longer have a reason to withdraw early in $T = 1$. Deposit insurance can be financed by a small tax banks pay during "good times" in order to fill up an insurance fund, or by forcing all banks to guarantee losses at other banks in case of a failure. However, runs could still happen if: Insurance is only partial, and a lot of depositors are over the insurance

limit. depositors don't trust the insurance guarantee or if the insurance takes a long time to pay out and depositors have a demand for immediacy.

Lecture 14: Sustainable finance

Sustainable finance refers to process of taking environmental, social and governance considerations into account when making decisions.

Individuals cannot make much of a difference: you can buy only a few shares, get a few votes: will not be able to influence brown companies.

Bauer et al. 2020 paper

People prefer more sustainable investment of their pension fund even if it is potentially costly. The reason behind this is social preferences.

Two studies.

Study 1:

Two treatments:

- 1: have 3 SDGs stated, want 4th added?
- 2: have 4 SDGs stated, want to remove 4th?

Then ask when they think returns will be highest.

Ask for social preferences. However, often difference between people saying and doing.

As a result you would expect that people that expect higher returns, would also support that. However, people who thought returns would be lower, still supported it! Explanation is social preferences.

Study 2:

Engagement of pension fund to push for sustainability on shareholder meetings, what will that do to returns?

Portfolio screening: invest more in green companies, what will that do to returns?

Results: people that thought that return would be a little lower, still supported sustainable investing.

Problems of results:

- Pro-social people might be overrepresented: others do not fill in survey
- Cost of implementation: people probably not know what they give up
- Some people are really far from their pension, and do not think about it.

Regulation

Currently no regulation is in place about pension funds asking clients about how they want their investments.

Regulators could make sustainable investment mandatory, set high standards or rely on industry to self-control. However, self-control can lead too high standards. Another problem is that ESG standards cannot be unified over industries.



Disclaimer

ESV Nijmegen makes an effort to keep the content of this summary up to date and where needed complements it. Despite these efforts it is still possible that the content is incomplete or incorrect. The offered material is a supplement for studying next to the appointed literature. The material is offered without any guarantee or claim for correctness.

All rights of intellectual property concerning these summaries are owned by the ESV. Copying, spreading or any other use of this material is not allowed without written permission by the ESV Nijmegen, except and only to the extent provided in regulations of mandatory law, unless indicated otherwise.

