EFR summary

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Lectures 1 to 12

Weeks 1 to 5

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Organisation and Strategy - IBEB - Lecture 1, week 1

Organization

Social **entity** with identifiable boundaries that functions continuously to reach common long-term goals (Robbins & Barnwell).

- **Entity** - each person should know whether he/she is a member of the organization or not.

Strategy

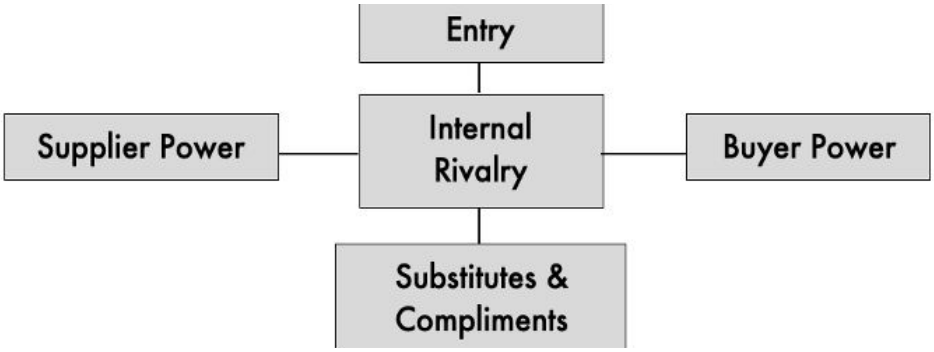
- Deliberately **choosing** a different set of activities to reach a firm's goals (Porter).
- The **framework** of a firm's business activities that provides **guidelines** for **coordinating** activities so that the firm can cope with and influence the **changing** environment. (Itami)

Relevance of organization and strategy

- Every organization needs a strategy to reach its long-term goals
- Strategies determine the success or failure of an organization
- Understanding how firms function will also help us understand how firms compete among themselves

Five-power model

A common thread of this course will be the **five-power model of Porter**. We will analyse it now.



- **Internal rivalry** is about the fight for market share within a market between firms.
    - Therefore, it is important to **define the market** in terms of **products** and **geography**.
    - It is also important to distinguish between **price** and **non-price rivalry**. Price rivalry is rivalry by changing the prices of products. Non-price rivalry can be via advertising or improving products.

- **Entry** of new firms often decreases the market share of other firms and increases internal rivalry in a market.
    - It is important to distinguish between **exogenous** and **endogenous entry barriers**.
        - Exogenous entry barriers are entry barriers which the firms inside of the market don't influence, for example regulations.
        - Endogenous entry barriers are entry barriers which the firms inside of the market do influence, for example successful advertising which created brand loyal consumers.
    - Example of entry barriers are:
        - Government protection
        - Brand loyal consumers
        - Access to essential inputs and locations
        - Minimum efficient scale of production
        - Learning curves

- Substitutes & complements:
    - **Substitutes** erode profits and raise internal rivalry, for example SMS vs. Whatsapp.
    - **Complements** can raise the industry demand, for example apps and smartphones.
    - There are a few important things to keep in mind with substitutes and complements:

        - Identifying substitutes and complements is on basis of quality and characteristics:
        - Substitutes (or complements) need to be on the same **price-value**. A 300 euro phone isn't a substitute for a 10000 euro phone.
        - The **price-elasticity** also influences the degree of complements and substitutes.

- **Supplier (upstream) / Buyer (downstream) Power**
    - A high(supplier)/low(buyer) price erodes the profits of an industry.
    - Suppliers/buyers have **indirect bargaining power** if the upstream/downstream market is competitive.
    - Suppliers/buyers have **direct bargaining power** if the upstream/downstream market isn't competitive, for example relationship specific investments.
    - Important factors on the bargaining power of buyers and suppliers:
        - Concentration of an industry (how many suppliers/buyers account for the market)
        - Purchasing/selling volumes
        - Availability of substitutes (alternative inputs)
        - Threat of forward integration: if the threat of a takeover by the supplier is believable it has more power. (Or if the threat of your firm taking over the buyer is believable, the buyer has less power.)

In the five-power model the focus lies on fighting for a bigger market share. An alternative perspective is that of **Co-opetition and Value Net**: working together for a bigger market.

Horizontal boundaries of the firm

In different markets, there can be:

- A domination of a few big players
- Lots of small players
- A few big players and lots of small niche players.

Economies of scale, economies of scope, and learning effects help us understand why this is the case.

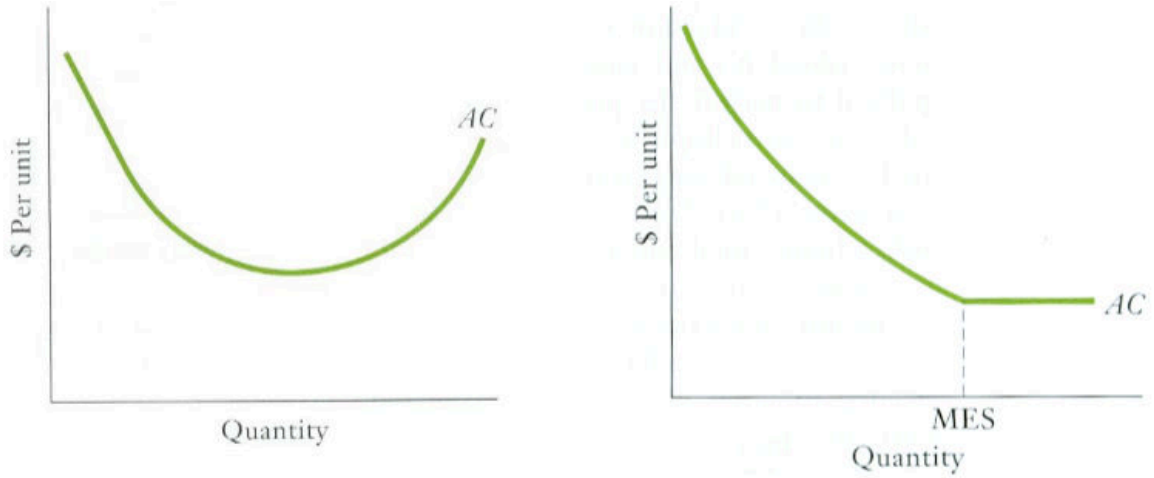
We are now going to look at the horizontal boundaries of a firm, which is mostly relevant to the internal rivalry part of the five-power model.

Economies of scale

Economies of scale: When a production process of a specific good/service exhibits economies of scale over a range of output, the average cost declines over that range.

- If Y(output) increases, then AC(average cost) decreases over that range.
- Over that range is MC(marginal cost)<AC

Diseconomies of scale: the exact opposite of economies of scale: MC>AC.



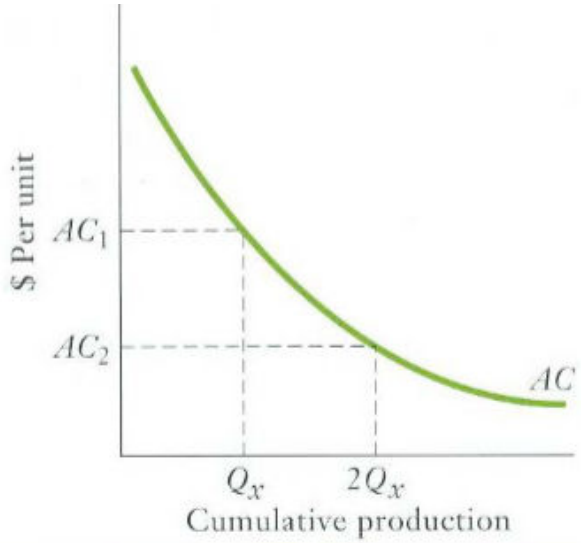
Economists used to believe that AC curves are U-shaped, i.e. at low quantities they exhibit economies of scale and after a certain point diseconomies of scale.

But in reality, we sometimes see that the real AC curve is more like the illustration on the right. The AC curve exhibits economies of scale up to a certain point. This point is called the **minimum efficient scale**. After this point the AC stays constant.

Keep in mind that economies of scale is about producing a certain production volume on a given moment in time. The AC in a restaurant can decrease over the years, because the chefs are getting better, but it will always be cheaper to serve 5 people instead of 2.

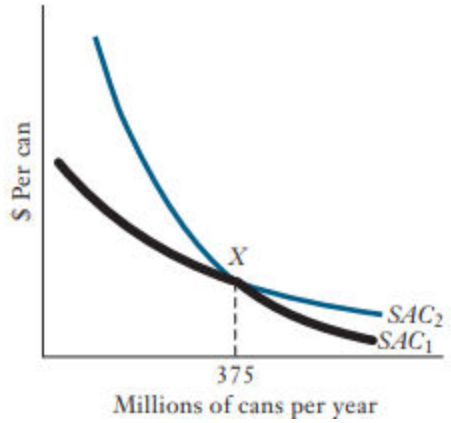
Learning curves

There can be advantages to learning: the AC decreases through accumulated experience over time (not necessarily in a given point of time). The **learning curve** is illustrated below:



Sources of economies of scale

- **Indivisibility** and **spreading** of **fixed costs**.
    - When inputs of production aren't divisible, the costs are fixed. Examples include machines, vehicles, or a lecture hall. When there is a bigger production volume, we spread these fixed costs over a larger quantity. This makes the AC decrease. $AC = \frac{TC}{Q}$, $Q \Uparrow \ \Rightarrow AC \Downarrow$.
        - These economies of scale are likely when a firm is capital-intensive. Firms can sometimes choose how **capital-intensive** vs. **labor-intensive** they want to produce based on their production volume.
    - Keep in mind that the short-run economies of scale aren't the same as long-run economies of scale. In the long run, firms can choose the short-run AC function (and methods corresponding to that function) to minimize their cost at a given quantity produced. This is illustrated below, where the lowest line at each represents the LAC function.



- **Higher productivity** of **variable production costs.**
    - Specialisation: this leads to a lower average cost, although it requires investments (education, training, experience, …). This is only rewarding when the market is big enough to earn back your investment.
        - "The division of labor is limited by the extent of the market"-Adam Smith.

- Other sources:
    - **Economies of Density**: saving costs by making more intensive use of a (transport)network. For example, food delivery services in a city vs. in a town.
    - **Purchasing**: firms can get bulk discount for purchasing large quantities.
    - **R&D**: The development of new products is connected to high fixed costs. If more products get sold we can spread these R&D costs.
    - **Advertising**: formatting advertisements, negotiating with the media, … leads to a lot of fixed costs. For big firms, there are lower advertising costs per final consumer.
    - **Physical properties**: the design of the production proces leads to savings for a higher output. An example of this is the '**Cube square rule**': the cost of a container = the surface. When the volume of the container doubles, the surface doesn't double. This leads to economies of scale.
    - **Stock**: Firms don't want their products to be sold out. Although keeping stock comes with a price. Bigger firms have a relatively smaller stock in comparison to the total revenue. The Albert Heijn can for example have central distribution centers, which make sure that a temporary rise in demand in one store doesn't lead to being sold out.

Economies of scope

Economies of scope exist when a firm can save costs per unit by raising the variety of products and services.

Mathematically, this is given by $\mathbf{TC(Q_X, Q_Y) < TC(Q_X, 0) + TC(0, Q_Y)}$ -> the cost of producing X and Y in 1 firm is smaller than the cost of producing X and Y in two separate firms.

Examples are:

- The Coca Cola Company in production and logistics.
- Apple in R&D (Spillovers between projects) and advertising ("**umbrella branding"**)
- Bakeries in purchasing and production.

This makes the question arise: *Why doesn't there exist one "mega" company for all products?*

- Higher labor costs for bigger firms (for example, via labor unions).
- Specialised inputs aren't always suitable for scaling up (for example, a top chef).
- Bureaucracy: organizational problems of bigger firms (for example, slow information flows).

Diversification

Lots of firms are **conglomerates**: they have products which aren't related to each other: not-related diversification. These are activities with limited possibilities for economies of scope.

Efficiency-based reasons for this are:

- Spreading underutilized organizational resources (a very specific management talent) => economies of scope.
- Internal capital market: cash flow of other activities finances profitable investments in companies with limited resources. In the **BCG matrix** below, we can conclude that the cash cow can help fund the problem child or rising star.

BCG Growth/Share Matrix		Relative market share	
		High	Low
Relative market growth	High	Rising Star	Problem child
	Low	Cash cow	Dog

Problematic arguments are:

- Diversifying the shares of shareholders (they can do this themselves)
- Identifying undervalued firms (very unlikely)
- Managers strive for growth even if it's not profitable (possibly for personal gain).

Diversifying is only useful for efficiency-based reasons.

Organisation and Strategy - IBEB - Video lecture 2, week 1

Vertical Boundaries of the firm

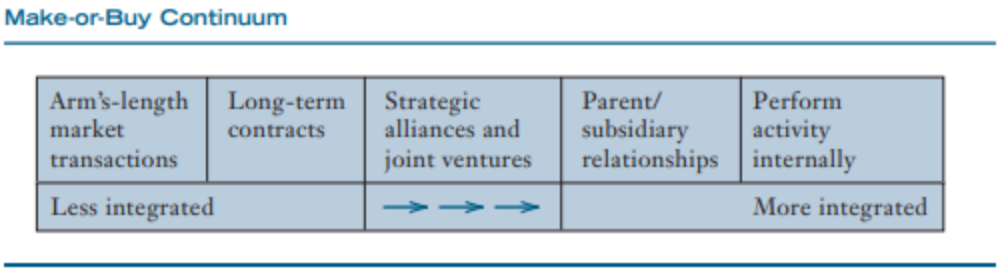
The **Vertical Chain** is a chain that represents all activities from purchasing raw materials to distributing and selling the end products/services

The **vertical boundaries** are the activities that the firm executes itself vs. the activities that are purchased from market firms.

Make-or-buy decisions:

- Internally executing = make
- Purchasing from market firms = buy

“Make” and “buy” are two extremes. There are lots of possibilities in between “make” and “buy”. See the illustration below for an example:



A vertical chain can, for example, look something like this:

Raw inputs -> Transportation and Warehousing -> Intermediate Goods Preprocessors -> Transportation and Warehousing -> Assemblers -> Transportation and Warehousing -> Retailers.

Where Raw inputs are the most upstream and the retailers are most downstream.

Keep in mind that next to the main chain we also have support services next to the chain. For example: Accounting, Finance, HR Management, etc.

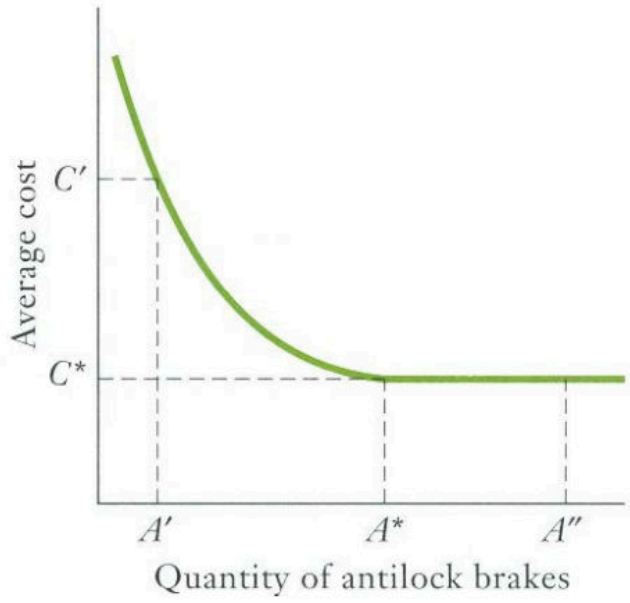
Why “buying”?

1. **Economies of scale and learning**

Market firms can be specialised in a certain activity. This is more efficiënt than an integrated firm. This has a few reasons:

- The **aggregated demand of the entire market leads to more production** than if a single firm only produced for itself. In economies of scale and economies of scope, more production is efficiënt. This higher production also triggers the benefit of economies of learning more.

  In the example below, we see that producing A’ when you make it yourself is not efficiënt. Therefore, it might be more efficiënt to purchase from an upstream firm that produces at a higher quantity. Keep in mind that the price of the supplier will be in between C* and C’ (C*<p<C’).



- **Specialisation**:
    - Investing in R&D makes more sense when you can spread out these fixed costs over lots of customers.
    - Patents and private information
    - Lower production costs

2. **Agency costs**

Shirking is the conscious acting of managers and employees against a firm's interest.

Agency costs are the costs from shirking and the costs to prevent shirking. For example:

- Production loss
- Cost of monitoring prestations
- Sanctions

Agency costs normally have a negative impact on profit. In **vertically integrated firms,** there is usually more shirking. Examples include:

- Overhead (support services like HR) costs are usually higher, since it is harder to manage a big firm.
- Subdivisions are cost centers
    - There is no competition, while market firms (suppliers) normally have competition.
    - There might not be a benchmark for evaluation (the market)
    - Subdivisions are harder to monitor.

    - There is a higher chance of outsourcing the activity.
- Managers react more slowly on inefficiencies.

3. **Influence costs**

Subdivisions in a firm will compete for limited financial and human resources. The managers will fight to influence the allocation of these resources.

Influence costs are the resources expended by individuals or groups within an organization to sway decisions in their favor, rather than to improve overall efficiency or outcomes.
In a direct way, this includes wasted time lobbying, longer meetings, etc. In an indirect way, this leads to bad decisions (not in the interest of the firm).

Influence costs are higher in bigger, more vertically integrated firms than in small firms.

Why "making"?

Contracts define the conditions for transactions:
- Rights
- Duties
- Conflict resolutions

The goal of contracts is to protect against opportunistic behaviour (shirking).

Two very challenging conditions decide how effective a contract is:
- Completeness
- Legislation regarding contracts

A **complete contract** defines:
- All rights and duties
- All possible situations in transactions.

This excludes opportunistic behaviour.

All contracts are, in principl,e incomplete:
- **Bounded rationality**: It is impossible to foresee all situations
- Lack of objective criteria and measurements
- **Asymmetric information**: making strategic use of private information

The legislation regarding contracts defines a few standards applicable to a broad range of transactions. This limits the incompleteness of contracts. This is not a perfect substitute for completeness.
Sometimes it is uncertain how to apply the standard. Legal dispute also isn't very demanding since this is very costly and harm the relationship.

It is important to see that contracts aren't the best resource for a smooth transaction. Therefore, there are high inefficiencies in "buying" compared to "making".

So now we get to the point. Reasons to "make":

1. **Coordination benefits**
   There are lots of diverse parties in a vertical chain. Therefore, coordination is necessary. Different types of coordination include:
   - **Timing** (a marketing campaign needs to be released at the right time compared to the product release).
   - **Sequence** (production needs to be done in a certain sequence)
   - **Technical specification** (parts of a product need to fit onto each other)
   - **Color** (different parts of a clothing piece need to have the same color).

   Coordination between firms is hard. We can try via contracts: fines, performance incentives, conflict resolution..., or via specialised intermediary persons.
   Since contracts are incomplete, it might be better to "make" instead of "buying", especially when the importance of coordination is big.

2. **Private information**
   Private information is information that only the company possesses. This can be about products or clients. Lots of times, this isn't patentable.
   Since knowledge is a competitive advantage, you wouldn't want to share this with suppliers or buyers. Therefore, it might be better to make the products yourself. Although private information can still leak due to the departure of employees.

3. **Transaction costs**
   Transaction costs are the costs of forming and managing a relationship. This includes time, costs of negotiating, writing, and enforcing contracts.

There are 3 central concepts for transaction cost:

- **Idiosyncratic investments**

  Idiosyncratic investments are investments that are bound to a certain transaction between two partners. There will be productivity loss when these investments are used outside of the transaction. Implications of this include that it isn't easy to change trade partners and therefore the relation is "locked-in".

  There is a fundamental transformation from before the investments (competitive situation) to after the investments (no alternatives, less competitive situation). Examples are:

  - **Place-based investments** (for example, placing an extra factory next to a client)
  - **Properties of physical assets** (for example, custom machines for a specific client)
  - **Client-specific assets** (investments in production capacity only utilized by a specific client)
  - **Specific personnel investments** (employees with knowledge and skills specifically useful for 1 client).

  "**rent**" = the expected profit in relation with the expected partner = $Q(P^*-C)-I$, in which:

  - Q=quantity
  - P*=price the expected partner pays
  - C=variable cost
  - I=investment/fixed cost

  The assumption is that the price an alternative contractor pays is lower than P* but still higher than C: $P^*>P_m>C$.

- **Quasi-rent**.

  Quasi-rent = rent - (expected profit best alternative)= $(Q(P^*-C)-I)-(Q(P_m-C)-I)=Q(P^*-P_m)$

  Without a relationship-specific investment $P^*=P_m$ => Quasi-rent = 0.

  A high quasi-rent leads to a high risk of losses and a risk of 'hold-up'.

- **Hold-up** is the renegotiation of the terms of contract with relationship-specific investments after investments are made.

This is an attempt by the firm that didn't make the relationship to obtain quasi-rent. This firm will set a lower price P** for which $P^{*}>P^{**}>P_{m}>c$. The other firm will have to accept this price since it is more attractive than the alternative.

Hold-up is a big problem if the quasi-rent is high and contracts are incomplete. This will lead to higher transaction costs by purchasing (good reason to "make"):

- Firms will protect themselves => difficult negotiation + frequent renegotiations
- Investments to improve ex-post bargaining position => higher costs
- Distrust => bad coordination + sharing little information
- Lower ex-ante investments: attempting to avoid hold-up => higher production costs.

"Make" or "buy" fallacies

There are a few bad reasons for "make" or "buy" decisions:

- "Make if the product is a competitive advantage" => if the product is for purchase on the market, it isn't unique and therefore not a competitive advantage.
- "Buy to avoid costs of making" => costs need to be carried in the chain.
- "Make to avoid paying a profit margin to a market firm" => The price of us, or a market firm, investing in capital is a profit margin: economic profit isn't accounting profit.
- "Make to avoid paying too much in times of scarcity" => long-term contracts are more efficiënt.
- "Make to gain market share from your competitors through vertical exclusion" => this isn't legal because of the competition legislation, and competitors can easily integrate themselves.

Organisation and Strategy - IBEB - Video lecture 3, week 1

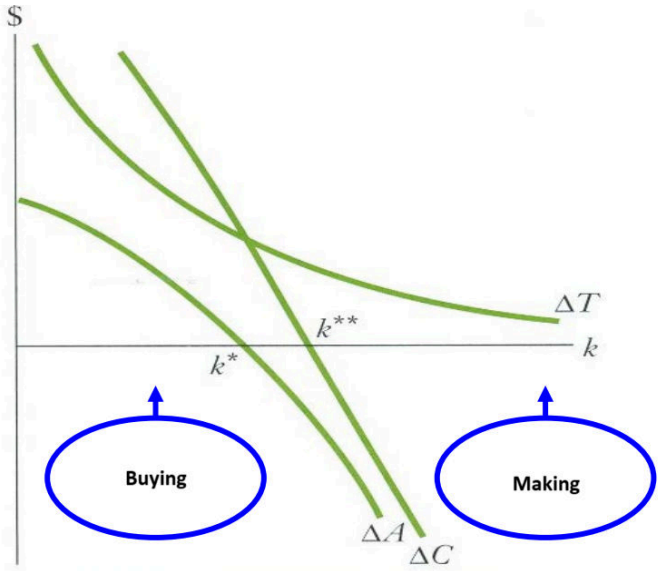
How do we choose between "making" and "buying"? - Efficiency

- Technical: lowest cost of technological production
    - Economies of scale, scope, and learning
- Agency: lowest cost of organisational production
    - Agency, influence, and transaction costs

There is a tradeoff to make: making improves agency efficiency vs. buying improves technical efficiency. The optimal vertical organisation minimizes technical + agency costs.

Now we are gonna try to model this. The x-axis will be the specificity of a product: k.

- $\Delta T = technical\ cost\ making - technical\ cost\ buying$
- $\Delta A = agency\ cost\ making - agency\ cost\ buying$
- $\Delta C = total\ cost\ making - total\ cost\ buying$



When k rises:

- Delta T will decrease: smaller economies of scale + less synergy of market firms

- Delta A decreases: more coordination + more specific investments + more hold-up

When the scale increases (for example, the same product but 5 times the production):

- Delta T decreases: more economies of scale, realizing yourself
- Delta A rotates: the original advantage increases.
- More vertical integration (more making)

When there are:

- Big economies of learning, scale, and scope (standard products)
    - Delta T is high
    - Less integration
- Big revenue in the share of the total market
    - Gaining economies of scope and scale yourself.
    - Delta T is low.
    - Lots of integration
- High specific investments
    - Delta A is negative and high
    - More integration, because the effect of agency > technical.

Double marginalisation

Let's say there are 2 firms. Both firms have market power, and one is upstream (firm 1) and one is downstream (firm 2).

- First, the input price of firm 1 > MC input of firm 1 (marginalisation 1)
- Then sales price of firm 2 > MC downstream = input price (marginalisation 2)

The **double marginalisation** represents the 2 mark-ups. This leads to a higher price for the final customer and a lower demand. When firms are more vertically integrated, there is no double marginalisation, this is a good reason for integration.

Vertical integration and property

When integration happens, there usually isn't any technical change in the vertical chain. We speak of a transfer of property.

Property = residual - rights of assets = decision-making authority for rights not in the contract.

We can see that for complete contracts, property rights are useless. Although since contracts are always incomplete, we need to specify rights outside of the contract. Property is very important for this. We will look at the **Property Rights Theory** of Grossman, Hart, and Moore. The main question on the theory is how property influences prestations in the vertical chain.

Let's say we have a downstream and an upstream firm. There are three possibilities for organizing these firms:

- **Non-integration**: 2 independent firms
- **Forward integration**: upstream firm takes over downstream firm.
- **Backward integration**: downstream firm takes over upstream firm.

The willingness to do idiosyncratic investments will influence the residual right. This gives the firm a better negotiating position, makes them capture a greater share of created value, and leads to more idiosyncratic investments.

The theory on which a firm should take over another firm is based on the impact on output:

- Impact firm 1 >>> Impact firm 2 => property firm 1
- Impact firm 1 ≈ Impact firm 2 => market transaction is possible
- Impact firm 1 <<< Impact firm 2 => property firm 2

Does integration guarantee the elimination of inefficiencies in market transactions? It is still important that there is a good governance structure (lecture 6) to guarantee efficient **path dependency** (past circumstances could exclude certain possible governance arrangements).

The decision-making power should also go to the manager/division with the biggest impact on performance activity.

Alternatives for "make" and "buy"

1. **Make-and-buy, Tapered integration**

Tapered integration is the mixing of vertical integration and market transactions. You can see this at the Albert Heijn with their housebrand and other brands.

Advantages include:

- Lower investments for expanding input/output channels
- Contract negotiations with market firms are easier since you have information on internal costs (compare them)
- It has a disciplining effect on both the internal organisation (*why aren't you as cheap as the market firm?*) and on the market firm.
- Protection against hold-ups.

Disadvantages:

- Possibly: Internal + external production < MES => Inefficiencies.
- It is harder to coordinate and supervise.
- Maintaining inefficient internal divisions leads to costs

2. Franchising

- Franchise taker:
    - Fund capital for building/exploiting stores
    - Pay a fee for using the brand and business model
- Franchise giver forces/allows:
    - Sell specific products
    - Decide on quality norms
    - Decide on suppliers

Advantages of franchising:

- Franchisegiver: high economies of scale
- Franchisetaker: knowledge of the local market

Disadvantages:

- Abuse of the franchisor's reputation

3. Strategic Alliances & Joint Ventures

A **strategic alliance** is an explicit partnership between firms to execute complex transactions without giving up autonomy. This can be:

- Horizontally: the same industry (quality label)
- Vertically: different parts of the vertical chain (Caterpillar x Land Rover)
- Between industries: not linked in the vertical chain (Senseo = Douwe Egberts x Philips)

A **joint venture** is a strategic alliance where an independent firm is created, which is owned by both partners (firms).
Advantages are:

- Preservation of the independence of the main activity.
- More coordination, cooperation, and informational transactions than with a market transaction.
- You don't need formal contracts for each decision => kinda like a marriage.

Disadvantages are:

- Risk of losing private information (at the end of the alliance)
- Coordination challenges (how do we work together if we have disagreements?)
- Big firm => Agency costs = partners monitor joint venture less strictly + influence costs = higher by a lack of a clear governance structure.

Transactions with reasons for a mix between "making" and "buying" have typical features:

- High incompleteness => hard contracts
- High complexity, no routine
- Specific (idiosyncratic) investments => hold-up possible
- Expertise buildup = expensive => economies of learning, scale
- High uncertainty => no long-term commitment
- Local participation obligates foreign investments.

4. Implicit contracts

It is possible to run a long run relationship via implicit contracts. These are contracts based on trust (cooperativity from both firms) and no contract (legislation). We can force this contract by making a threat of loss of future business. This leads to less opportunistic behaviour.

Organisation and Strategy - IBEB - Video lecture 4, week 2

Principal-agent relationship

The **principal-agent relationship** is a relationship where the principal hires an agent. This agent will perform actions (or take decisions) which influence the payoff of the principal.

Agency problems in the principal-agent relationship can form when:

1. The objectives of the principal and agent differ.
2. The principal (hardly) can't observe
    a. What the agent does -> shirking
    b. What the agent knows -> asymmetric information

Principal-agent relationship

There are a few possible solutions for principal-agent relationships:

1. **Bureaucracy**

You can set procedures & rules. This limits the freedom of choice for the employee and has a goal of preventing undesirable behavior. There is a possibility that this leads to more inefficiencies.
Use this when: inefficiencies of 'red tape' (with rules) <<< problems 'anarchy' (no rules).

2. **Monitoring**

You can also control the agents to observe and punish undesirable behavior. This way, you can also collect 'hidden' (asymmetrical) information.
Disadvantages are:

- Monitoring is never perfect
- Monitoring is expensive
- Monitoring creates an extra principal-agent relationship (who monitors the monitor).

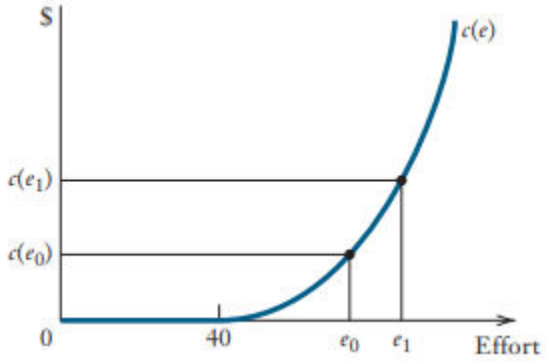
3. **Performance Incentives**

Performance incentives have as goal to make the objectives of the principal and agent more equal. The mechanism works as follows: the payoff of the agent is linked to the result of the principal. The agent will receive more when the objective of the principal is reached. This way the objectives of both parties are more equal.

We will now put performance incentives into a formal model:

- The firm(principal) will hire a salesman(agent).
- The firm will earn 100$ per sold unit.
- The salesman will make effort e. One extra e leads to one extra unit sold. Therefore, the firm's revenue is $100e$.
- The cost of the effort of the salesman is modelled as follows:

$$c(e) = \begin{cases} 0 & \text{if } e \leq 40 \\ 1/2(e-40)^2 & \text{if } e > 40 \end{cases}$$



Let's say the effort of the salesman is 40. The MC of 1 extra effort is $c(41) - c(40) = \frac{1}{2}(41 - 40)^2 = 0.5\$$. This is way less than the marginal revenue of 100$ for the firm. A problem with this is that e is not visible to the firm, therefore it is not possible to set up a contract.

Implementing performance incentives

We will try to fix this asymmetric information with performance incentives. We will go over a few cases:

1. Case 1: a fixed salary of $1000/week

The salesman will maximize his utility function $u(e) = F - c(e) = 1000 - c(e)$. He will choose e=40, because c(40)=0 which gives him u(e)=1000.
The firm will have a profit of $\pi = 100e - F = 100 * 40 - 1000 = 3000$.
In this situation, both the firm and the employee can earn more.

2. Case 2: a fixed salary of 1000$/week + 10% commission on sales

The employee will once again maximize his utility function $u(e) = 1000 + 0.1 * 100e - c(e) = 200 + 50e - \frac{1}{2}e^2$. Maximizing this function gives e*=50. The employee will achieve a utility of $1000 + 0.1 * 100 * 50 - \frac{1}{2}(50 - 40)^2 = 1450 > 1000$ (case 1).

The profit of the firm will be: $100e - F - 0.1 * 100e = 3500 > 3000$ (case 1)

Let's now say we will decrease the fixed salary. Implementing this in the utility function doesn't change the optimal effort for the salesman (since fixed salary is a constant). The firm wants to decrease the fixed salary to the lowest point possible. Therefore, we need a fixed salary where the salesman is indifferent between:

- No extra effort (e=40) with a fixed salary of 1000$.
- 10e extra effort (e=50) with a fixed salary of F$.

This gives the calculation:

$F + 0.1 * 100e - c(e) = 1000 \Rightarrow$

$F = 1000 - 0.1 * 100e + \frac{1}{2}(e - 40)^2 \Rightarrow$

$F = 1000 - 0.1 * 100 * 50 + \frac{1}{2}(50 - 40)^2 = 550$

The minimum fixed salary the firm needs to offer is 550$.

It's also possible to maximize the commission to 100%. This means that the salesman will receive all revenue (for example, franchising). The firm will ask for a license fee "F".

The employee will maximize the function $100e - \frac{1}{2}(e - 40)^2 - F$. This gives e*=140 with the revenue being 14000$ and c(e)=5000$. The salesman is indifferent when the utility function equals 1000$ (old reference point). This is where F=8000$. You can go over this yourself.

Problems with performance incentives

There are three big problems with performance incentives:

1. **Risk, performance premiums**

Most people are risk-averse. They will prefer a fixed salary over an uncertain commission. Keep in mind that individuals differ in risk attitudes. The **risk premium** is the amount an agent wants to pay to avoid risk = the difference between the expected value of a risky contract and the expected value of the certainty

equivalent. More risk aversion leads to a lower certainty equivalent and a higher risk premium.

So far, we assumed that our revenue is $100e$. Now we will restructure the revenue with uncertainty to: $100e + \varepsilon,\ \varepsilon \sim N(0,\ \sigma)$.
Intuitively, we can also feel that revenue does also involve luck/bad luck next to effort. A risk-averse salesman will want compensation for this risk.

The wage of the salesman will be: $F + \alpha(100e + \varepsilon)$, α = commission percentage.
The certainty equivalent of the salesman will be: $E[loon] - [\frac{1}{2}\rho Var(wage)]$, ρ is the parameter for risk aversion. A higher rho (ρ)= more disutility because of uncertainty. We will accept this uncertainty when the uncertainty equivalent-cost of effort > 1000
=> $F + \alpha * 100e - \frac{1}{2}\rho\alpha^2\sigma^2 - \frac{1}{2}(e - 40)^2 > 1000$

2. **Multitasking**

A job consists of multiple tasks. A performance incentive won't cover all tasks in a job. This will lead to employees neglecting tasks that aren't in the measurement for the performance incentive. Therefore, it is possible to complement performance incentives with: **subjective performance evaluations**, **implicit contracts**. This will lead to the stimulation of effort for multiple tasks.

3. **Incentives in a team**

When work is organised in teams, the individual payoffs will be linked to the performance of a team. This leads to the "**Free-rider**" problem:

- Total team profit by action > total cost of action by individual, (good for team)
- Total cost of action by individual > 1/n*total team profit by action, (not good for individual). Possible solutions are creating smaller teams and repeatedly collaborating with teammates.

Organisation and Strategy - IBEB - Video lecture 5, week 2

Structuring of organisations

The **organisation structure** = all (in)formal regulations about:

- Division of labor
- Decision-making power of managers and employees
- Routines and information flows

The structure of an organisation is very important to improve performance and implement strategies. Therefore, we often see big investments in optimising organisational structure.

Basic organisations include:

- **Individual**
  - Little interaction with others
  - Paid for individual actions and results
  - For example, traders, tennis players, and yourself taking an exam.
- **Self-managing teams**
  - Close cooperation, informal information exchange, and coordination.
  - Paid for team performance.
  - For example: strategy consultants, beach volleyball, or a group assignment in uni.
- **Hierarchy**
  - 1 member is specialised in control, coordination, and resolving disputes.
  - Bigger groups (firms) + more complex operations.
  - For example: a football team.

Big firms are often very complex hierarchies. It organises individuals in groups and organises groups in bigger groups.

Problems with organizations

To make optimal choices in big firms, there are two main problems:

1. **Departmentalization**

Departmentalization is the splitting of an organisation in different groups and set of groups according to different dimensions:

- Product
- Function
- Geographical location

Departmentalisation must be structured such that economies of scale and scope are achieved.

2. **Coordination and control**

Coordination is the structuring of information flows. Decision-making on each sub-unit level must be facilitated with the right information.
Control is the structuring of the location of decision-making and rule-making in a hierarchy. The main question is: "who is responsible for which decision?"

There are a few approaches to coordination:

- **Self-containment/autonomy**: individual units
    - These units have independent goals
    - There is minimal information flow
        - **Profit centres**: divisions for each product
        - **Responsibility centres**: divisions for each responsibility in a firm (for example, HR division).
- **Lateral relations**: close coordination between units
    - There are information flows between units
    - Coordination is needed between products, geography and functions.

There are a few approaches to control

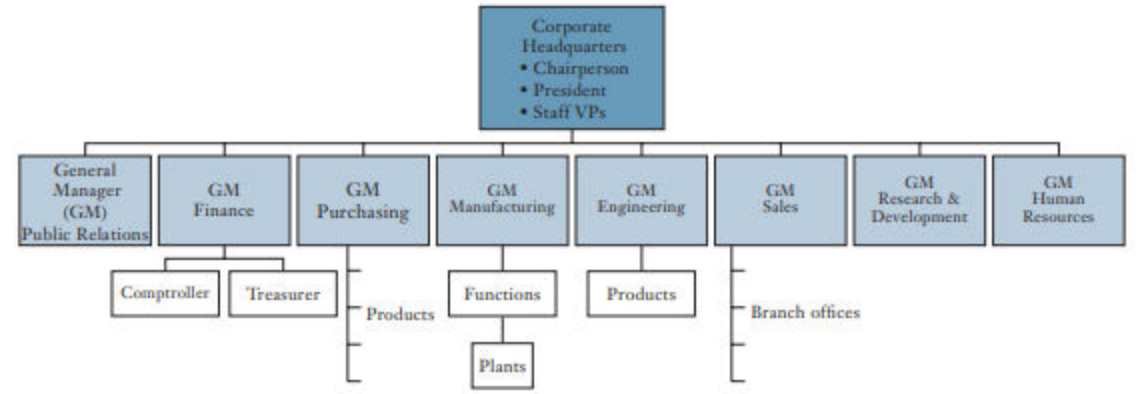
- **Centralization**
    - More decisions are made by senior managers because they see the big picture.
    - This is limited by the maximum "**span-of-control**" (how many people you can control).
- **Decentralization**:
    - More decisions are made by the lower management, where they use local information.
    - In this case, the advantages of vertical integration might disappear.

Although keep in mind that there is a continuum of possibilities in different dimensions and that it doesn't have to be an extreme, like centralization.

Types of organizational structures

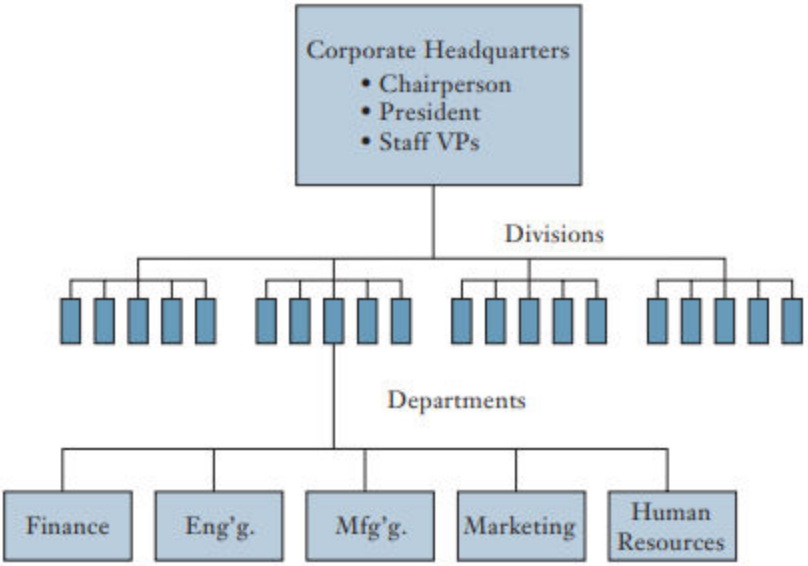
- **Unitair functional structure (U-shape)**
  - 1 unit is responsible for 1 basic function of a firm (responsibility centers)
  - The focus is on technical efficiency.
  - Strategic decision making happens in a central corporate headquarters.
  - A unit isn't like an independent firm (they need each other, no manufacturing without HR or Engineering)
  - This originates from the USA at the end of the 19th century.

Sample Chart of a Functional Organizational Structure



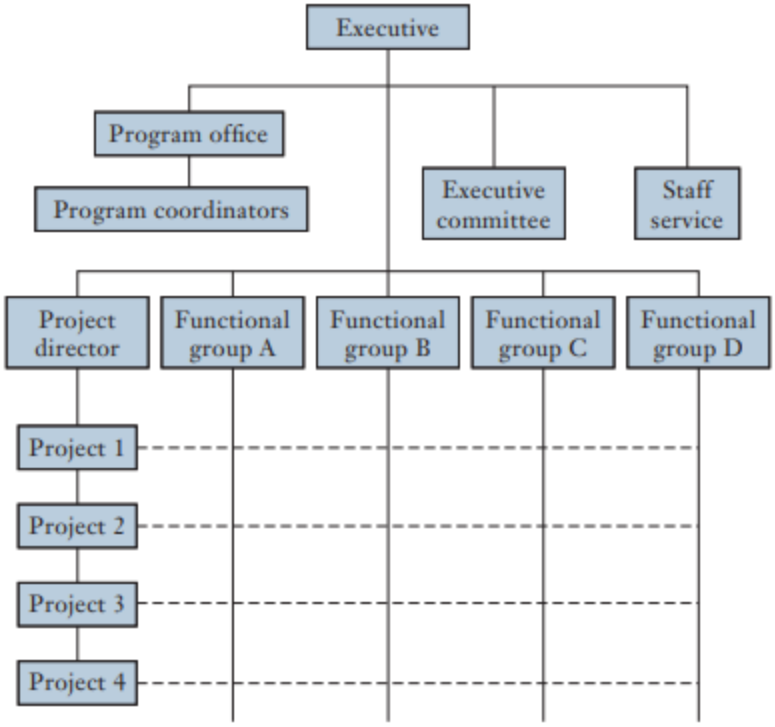
- **Multidivisional structure (M-shape)**
  - A division is a product line or a geographical market (="independent firm")
    - There are departments in the divisions (U-shape).
    - Operational autonomy
    - They have their own profit goals
  - The corporate headquarters does strategic supervision of the top management.
  - This originates from General Motors(1920s)

Sample Chart of a Multidivisional Structure



- **Matrix structure**
  - Units have multiple dimensions (for example, product and geography)
    - 1 unit has more than 1 manager, and therefore, a conflict of interest can arise.
  - It combines economies of scale (1 product in multiple countries) and economies of scope (multiple products in 1 country).

A Matrix Organization Structure with Project and Function Dimensions



- **Network structure**
  - This is a flexible organisation in which:
    - Employees put effort into different tasks
    - Groups are formed by employees autonomous
    - Adjust the working method if the task changes
  - A possibility is also a network between multiple firms
    - Formal or informal relationships
    - Implicit contracts can lead to this.
    - This is more popular since organizational costs decrease (internet).
  - Another possibility is **modular organisation**:
    - For example, Apple's App Store and software developers (independent firms)
    - They are in a network because of the technology standard.

Cohesion of the structure

The optimal organisational structure depends on the environmental circumstances:

- Regulations
- Uncertainty
- Technology

The two most important environmental factors are:

1. **Technology and task dependency**

Technology = scientific knowledge that underlies what a company does.
A mature, slowly changing technology leads to a constant environment. Therefore, economies of scale can be maximised, and often a stable hierarchical structure is fitting.

New, innovative technology leads to a changing environment. Continuous change of the organisation is crucial. In that case, decentralisation is fitting.

Task dependency is the degree to which positions depend on each other to do their own work.

- **Mutual dependence** (for example, Apple software and hardware)
- **Sequential dependence** (for example, input and assembly in car manufacturing)
- **Pooled interdependence** (for example, Disney ESPN, and Disney Pixar. They work fully independently, but one's reputation influences Disney as a whole)

2. **Information processing**

The structure of an organisation reflects the need for information. This supports optimal information processing.

- Routine jobs => workgroups operate independently
- Authority (problem solving) => for exceptions or harder problems
- Complex exceptions => higher level of responsibility in structure.

For this, efficient access to information is crucial.

Structure follows strategy

Given certain environmental factors, the structure of an organisation will reflect the general strategy.
Alfred Chandler, therefore, said “structure follows strategy”. In the 1920’s there was a lot of diversification, which led to firms moving from U-shape to M-shape structures.

The process of a firm becoming a multinational (MNE) is often as follows, in which the structure follows the strategy.:

1. An international division (export division)
2. Country-specific divisions
3. Transnational strategy: world = market

For the transnational strategy, there is often a combination of a matrix and a network structure. This gives economies of scale/scope for worldwide production, and local factors are combined with efficiency and profit through centralization. For example, R&D on a worldwide level and marketing on a national level.

Organisation and Strategy - IBEB - Video lecture 6, week 2

Social context

In the social context, a firm is defined as a transaction-based institution that is designed and created by entrepreneurs.

Social context is all about firms trading in a network of existing relationships. These relationships are based on shared habits, language, norms, and rules.

Social context is very useful for trust and leads to lower transaction costs. This is because a good social context leads to:

- Better relationships within a firm.
- More efficient exchange of goods/services between firms.

People and firms often have shared views. There are multiple sources for this:

- Shared history
- Shared regulations
- Shared political environment
- Shared technological limits

These shared views are often very persistent over time, but sometimes see dramatic change (for example, the fall of the Iron Curtain in Germany). When there are changes in shared views, there are new possibilities for competitive advantage.

Internal social context

The **internal social context** is the formal and informal mechanisms that influence the actions of managers and employees (business environment).

Keep in mind that the performance of a firm is the sum of individual performances of employees. Performance incentives are a possible solution for the principal-agent problem, but its effectiveness is limited. Formal control isn't enough, since there can be conflicts, different motivations, and limited authority. Power and culture is an alternative to reach goals.

We are gonna look at two parts of the internal social context.

1. **Power**

Power is the ability to reach goals through **non-contractual exchange relations.**
Power isn't authority which is the explicitly assigned rights to make decisions (formal structure).
Power also isn't influenced. **Influence** is making use of power by an individual in a certain situation.

How is power created?

- **Power bases**
    - Legitimate power (formal authority, for example, a trainer in a football team)
    - Power to reward/punish employees
    - Power based on status, image, or reputation.
- **Power because of relations** = social exchange/dependence of resources.
    - Power = low own dependence + big dependence on others
    - Power = access to essential resources and indispensable skills (resource dependence).
- **Structural holes**: An actor in a social network that is an essential link between individuals or groups.
    - Access to information of both groups
    - This gives negotiation power compared to both groups ("**tertius gaudens**")

- **Actors with a prominent position in a network**
    - Influence organizational outcomes.
    - The firm might be vulnerable when this person leaves.

Now you might wonder when power is desirable, and when not. A manager needs a certain amount of power, which is authority by structure.

- Managers should get more power when:
    - High coordination problems and agency costs between managers and employees.
    - There is a stable environment.
- Managers should have less power when:
    - High coordination problems and agency costs between managers.
    - There is a changing environment.

2. **Culture**

Culture is the set of shared values, beliefs and norms which influence behavior and preferences. This influences the personal relations within a firm and is an informal guide to “good” behavior.

Culture can be a competitive advantage or disadvantage:

- Competitive advantage if it is unique, not imitable, and valuable.
- Competitive disadvantage if a firm should incorporate multiple cultures (for example, Chinese multinationals in Europe).

Within a firm culture is slow and difficult to adjust. There are a few ways you can adjust culture:

- **Role of management**
- **Shocks in the competitive environment of a firm**
- **Growth, fusions, and acquisitions**

It can be a trump when there is a good match between strategy and culture. Cultural norms can decrease or increase transaction costs.

External social context

The **external social context** is the external business environment of a firm that influences the activities of firms. This is both the close business environment and the macro environment.

Outside of the boundaries of a firm, we should fix problems without making use of the authority of a manager (he has no authority outside of the firm). We can do this with institutions.

1. Institutions

Institutions are stable organizational arrangements. This gives order in economic transactions.

- Formal institutions: laws, property rights, regulations, …
- Informal institutions: behavioral norms, attitudes, habits, traditions, …

Regulations of governments influence the strategy of firms. Regulations are costs for firms:

- Direct costs for compliance
- Fines for non-compliance
- Costs from fewer strategic options
- Higher price of goods
- Market disruptions from regulatory imperfections.

It is also possible to use the external social environment as a strategic advantage. You can, for example, lobby for extra regulations on a competitive sector.

2. Resource dependence

In the business environment, there are dependent and powerful relations with other firms or organisations in the environment. These can be competitors, suppliers, buyers, or non-commercial organisations. **Status and reputation** are intangible resources that give power to bigger firms. This can be a way to decrease dependence on other firms.

Organisation and Strategy - IBEB - Video lecture 7, week 3

Competition

Competition is when a firm's strategic decision influences another firm's performance.

- **Direct competition**: the strategic choice of a firm has a direct effect on the performance of another firm (BMW station wagon vs. Mercedes station wagon)
- **Indirect competition**: the strategic choice of a firm influences another firm's performance via a third firm (G-star vs. Zara via Levi's)

This means that in reality, firms are in direct competition with one another when they produce substitutes.
Two products are **substitutes** when they have:

- similar performance characteristics (same strength of processor)
- Similar in use (iPad with tablets)
- Similar in geographic market

There are a few ways to identify competition:
1. **Cross-price elasticity**
Formula: $\eta_{yx} = \frac{\Delta Q_y / Q_y}{\Delta P_x / P_x}$

- $\eta_{yx} < 0$ => complements
- $\eta_{yx} = 0$ => unrelated
- $\eta_{yx} > 0$ => substitutes

2. **Diversion analysis**: this is the calculating of the market shares of the second choice of consumers. Apple can for example ask their consumers what their second choice was. The choice which came up most is their strongest competitor.

3. **Standard Industrial Classification** (SIC) **codes**: we rank firms based on their charasteristics. This way we can identify close competitors.

4. **Geographic identification**: via **flow analysis**, firms examine where customers come from and where they go to buy products or services, helping to identify regional competitors and market reach.

The market

A **market** consists of buyers and sellers of a product.
A market is often characterised by its concentration of sellers of a good, the **structure of the market**. We assume you are aware of the characteristics of perfect markets (perfect competition) and imperfect markets (monopolistic competition, oligopoly, monopoly). These market structures sadly only provide a static view of markets. In reality the market structure often changes.

Markets often change with entry. New firms will learn their relative productivity. They will either exit the market or grow their firm. When there is a lot of growth, firms might have economies of scale, this may lead to imperfect markets.

Structure-Conduct-Performance

Schumpeter (Austrian school):

- Competition is based on innovation (product/process)
- Innovative firms become monopolists (imperfect market)
- Other firms can challenge these monopolists with innovations.

We can see that structure, strategy, and performance can influence each other.

Structure-Conduct-Performance (SCP) of **Harvard School**: This was very influential in industrial organisations in the 1950s to 1970s. It is all about **forward causality**:

- Market structure (concentration) influences conduct (strategy), and conduct influences performance.
- The market structure is determined by demand, supply and cost structures (exogenous).
- Performance is the final measure.

The SCP says a high concentration (imperfect market) is bad for the consumer. This has lead to regulations around competition.

So, how do we measure structure?

- **N-firm concentration ratio**: the combined market share of the Nth biggest firms.

- **Herfahl-index**: the sum of the squared market shares. $H = \Sigma_i (S_i)^2$

How do we measure strategy (conduct)? We can do this by taking a strategy in the broadest terms:

- Prices of products
- Investments
- Fusions and acquisitions
- Product range
- Collusion

How do we measure performance?

- **Lerner-index**: $L = \frac{P-MC}{P}$. This measures market power. An increase in L means an increase in market power.
- Profitability: return on private equity.
- Efficiency of the production process.
- Patents.

SCP of Harvard school also led to empirical observations.
Hypothesis 1:

- Market power increases when market concentration increases.

Hypothesis 2:

- When entry barriers become stronger, market power increases.

Chicago school

The **Chicago school** was more focused on **backwards causality**: firms make decisions, which influence both performance and structure. More efficiënt firms are more profitable and grow into bigger firms (market structure).

They also thought that **monopolies are temporary**: the entry of firms will eventually lead to more competition. Firms can act strategically to prevent the entry of new firms.

Harvard school vs. Chicago school

The **collusion hypothesis** argues that if there is a positive correlation between market concentration and profitability, this is proof of collusion (market power abuse). => SCP of Harvard School

The **efficiency hypothesis** argues that if there is a positive correlation between market concentration and profitability, this is proof of a natural tendency of firms to become successful. => Chicago school

The Structure-Conduct-Performance theory showed a positive link between market concentration and market power, influencing stricter competition laws. However, over time, dissatisfaction with certain antitrust rulings led to the decline of SCP. The Chicago School challenged the Harvard School's strict views, emphasising that some practices, like cost reduction through innovation, can be economically efficient, not necessarily anti-competitive.

Cartels

A **cartel** is an association of manufacturers or suppliers with the purpose of maintaining prices at a high level and restricting competition.
In the EU, cartels are banned under Article 101 of the EC Treaty, which prohibits anti-competitive practices like price-fixing, market sharing, and quota agreements. This law is similar to U.S. antitrust regulations and aims to protect fair competition.

I would recommend doing exercises from microeconomics on duopolies and cartels. There is a possibility they will give a mathematical exercise on the exam.

In cartels, there is often an incentive to differ from cooperating. This is illustrated below.

Firm 1/Firm 2	Cooperate	Deviate
Cooperate	1800; 1800	1350; 2025
Deviate	2025; 1350	**1350**; **1350**

This makes cartels unstable. When both firms deviate, it will be a less optimal payoff for both of them. In repeated games, the equilibrium is a tit-for-tat strategy.
Cartels can work when:

- There is a punishment mechanism
- Firms marginal costs are consistent
- The profits of cooperating are, in the long run, greater than the profits of deviating.

Organisation and Strategy - IBEB - Video lecture 8, week 3

Entry and Exit

The number of players in a market can change over time. Key concepts in this are entry and exit.

Entry is when a new firm starts with production and sales in a market. This is possible via:

- Creating an entirely new firm
- Diversifying into a new market as an existing firm. This can also be a new geographical market.

The effect of entry in a market is that the competition increases and the market share of incumbents decreases.

Exit is when a firm stops production and sales in a market. Possibilities are:

- A company ceases to exist
- A firm stops producing a certain product or product group
- A firm leaves a geographical market

We often see that the percentage of entry and exit is way higher for services than for products.
A firm will enter a market if the sunk costs (for example, specific machines) of entry are lower than the discounted value of profits after entry (net discounted value > 0). The earnings after entry depend on the demand and cost conditions and the degree of competition in a market.

Entry barriers

There are huge differences in the number of entries per industry. This can be explained by **entry barriers**.

- "An entry barrier is an advantage of established firms in an industry which makes it difficult or impossible for new firms to enter the market on an equal footing." (Bain, 1956)

- "An entry barrier is the cost of producing that must be borne by a firm which seeks to enter an industry but is not borne by firms already in the industry" (Stigler, 1968)

Entry barriers decrease the chance of entry and influence the profit of incumbents as well as the profit of entrants.

In Bain's typology, markets can be characterised by:

- Structural and strategic entry barriers
- Entry deterring strategies

There are three possible conditions of a market at entry:

- **Blockaded entry** -> incumbents don't have to discourage entry, structural entry barriers are effective.
- **Accommodated entry** -> incumbents don't have to discourage entry, structural entry barriers are ineffective and strategic entry barriers aren't (cost) effective.
- **Dettered entry** -> incumbents discourage entry, strategic entry barriers are (cost) effective.

The key differences between entrants and incumbents primarily lie in costs. For incumbents, many costs are already sunk, whereas for entrants, these represent new, incremental expenses. Entrants also face challenges in establishing relationships with suppliers and buyers, connections that incumbents have already built over time. Additionally, incumbents benefit from learning curves that give them efficiency advantages, which are difficult for newcomers to match quickly. For customers, switching from an established incumbent to a new entrant often involves high switching costs, further disadvantaging the entrant.

Structural vs. strategic entry barriers

Below, we will explain the different kinds of entry barriers.

1. **Structural entry barriers**

Structural entry barriers (advantages of incumbents) exist when:

- Control over essential resources
    - Natural resources in the hands of existing firms can be insurmountable.
    - Patents can prevent entrants from producing a product.
    - Special knowledge which is hard to copy by entrants.
- Economies of scale and scope
    - If economies of scale for incumbents are significant, there are possible cost disadvantages for entrants. This is especially relevant in capital-intensive industries.

    - If economies of scope is significant, there are possible cost disadvantages for entrants. This is not relevant when the entrant enjoys these economies of scope.
- Marketing advantages
    - Introducing a new product under an umbrella brand of incumbents is easier (also economies of scope)
    - It is easier to have power in the vertical chain (a more attractive place on the supermarket shelf)

2. Strategic entry barriers

Strategic entry barriers are entry barriers which are raised by the incumbents themself. Strategic entry barriers only work if the incumbent reaches higher profits as a monopolist, and the strategy changes the expectations of an entrant.

- **Limit pricing**
    - The incumbent lowers its price to discourage entry. This can lead to a decrease in profit and not being able to fulfil demand.
    - **Strategic limit pricing** = the price is just below the threshold that would be profitable for potential entrants.
    - **Contestable limit pricing** = the price is near the average cost of the monopolist.
- **Predatory pricing**
    - Temporarily decreasing the price below marginal costs to push the entrant out of the market. After which, you will compensate the losses with monopoly profits.
        - **Chain-store paradox**: when all entrants can perfectly foresee how the incumbent prices, predatory pricing doesn't work.
    - Limit pricing and predatory pricing can be effective when there is asymmetric information between the incumbent and the entrant. These strategies are particularly useful when the entrant lacks information about the incumbent's cost structure or pricing behaviour after entry. By setting a low price, the incumbent may signal a willingness or ability to sustain aggressive pricing, leading the entrant to expect post-entry prices to fall. This expectation can make market entry appear unprofitable or too risky, discouraging the entrant from competing.
- **Capacity expansion**
    - The incumbent can threaten to decrease the price and increase the production (when the incumbent doesn't produce at maximum capacity yet). This is only smart when:
        - The incumbent has a sustainable cost advantage
        - The growth of demand is slow

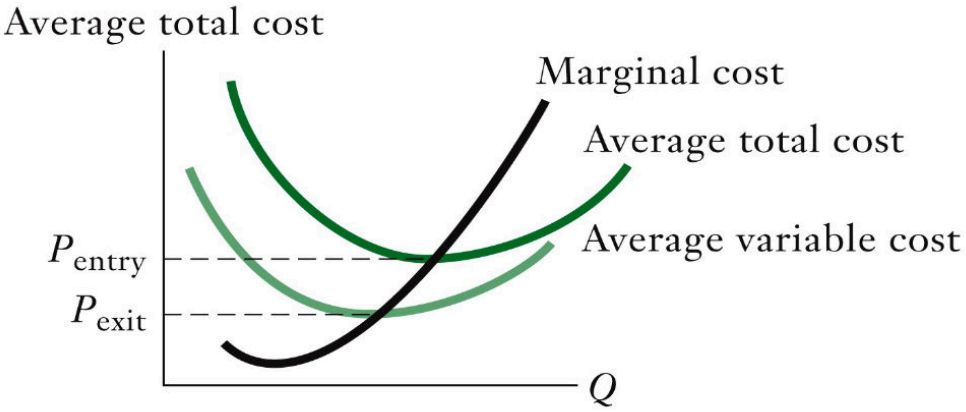
        - The incumbent can't undo the investment in extra capacity
        - The entrant does not want to build a reputation for appearing tough
- **Strategic bundling** of products
    - When a combination of goods/services is sold for a price which is lower than the price of selling both products separately. This works when:
        - A monopolist in one market may use strategic bundling across markets to deter entry. By bundling products from the monopolised market with those in the contested market, the incumbent can make entry less attractive or unprofitable for rivals, leveraging its monopoly power to protect the second market.
        - Consumers don't have any other choice but to buy the bundle of products from the incumbent.

Exit barriers

Just like entry barriers, exit barriers also exist. Possible exit barriers include:

- Sunk costs -> this makes the MC stay low.
- The value from selling capital is probably low.
- Government regulations

Exit and entry barriers account for the difference in the minimum price for exit and entry. If $P^* < P_{exit,}$ a firm will exit the market. If $P^* > P_{entry,}$ a firm will enter the market. If $P_{exit} < P^* < P_{entry,}$ firms won't enter, but also won't exit.



Organisation and Strategy - IBEB - Video lecture 9, week 4

Strategic commitment & flexibility

When firms decide on strategies, we need to distinguish between the short- and the long-run:

- **Tactic**: effect in the short run. Easy to undo. For example, changing the price of a product.
- **Strategy**: implications in the long run. Hard to undo. For example, investing in a new production facility

Strategic commitment refers to the choices or strategies of a firm that have long-term effects and are difficult to reverse.
A problem with strategic commitment is that the long run and irreversibility lead to uncertainty and risk. Strategic commitment can, however, influence the choices of competition. Therefore, the firm should anticipate on these choices of competition.

The inflexibility of strategic commitment can have strategic value. It limits the options of a firm, but influences the expectations of competition. This shifts the game from simultaneous to sequential.

Strategic commitment only works when it is:

- Visible for the competition
- Perceived as valuable for the firm by competition.
- Perceived as believable by the competition.
- It is irreversible.

A gametheory example on strategic commitment:

1/2	A	B
A	250, 90	330, 100
B	300, 130	360, 120

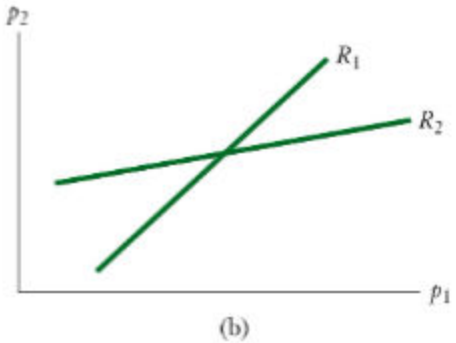
Let's say that player 1 is dominant and can commit themself. The original Nash Equilibrium was (B, A). When player 1 commits to play A, player 2 will choose B, and we reach (A, B). This increases the payoff from 300 to 330 for player 1.
In reality, firms will sometimes bluff on a strategic commitment. It is important to note that systematic bluffing doesn't work.

You can increase the credibility of the strategic commitment by:

- Changing the payoffs in the game. This makes it interesting for you to continue your commitment.
    - You can do this via a **threat** (a decrease of reputation when not continuing)
    - or via a **promise** (for example: a contract which makes sure that you have to pay a fine when not continuing).
- Limiting the possibility of opting out of the commitment by removing the possibility to opt out of the commitment. For example, relationship-specific investments.
- Using others to enforce your commitment: a team is more credible than an individual. You can think of a subsidiary in a multinational.

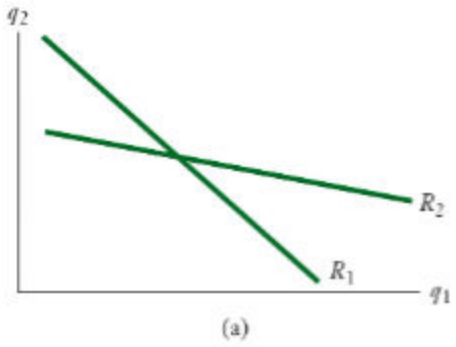
Complementarity & Substitution

Strategic complementarity: the action of a firm leads to a similar action for competition. The aggressive behaviour of one firm leads to more aggressive behaviour of the other firm.
This is often the case for the Bertrand model (firms deciding on prices). The decrease in price of one firm leads to a decrease in price of other firms. We can model this via reaction functions:



(b)

Strategic substitution: the action of a firm leads to an opposite action for competition. The aggressive behaviour of one firm leads to less aggressive behaviour of the other firm.
This is often the case for the Cournot model (firms deciding on quantities). The decrease in quantity of one firm leads to the increase in quantity of other firms. We can model this via reaction functions:



Tough & Soft commitments

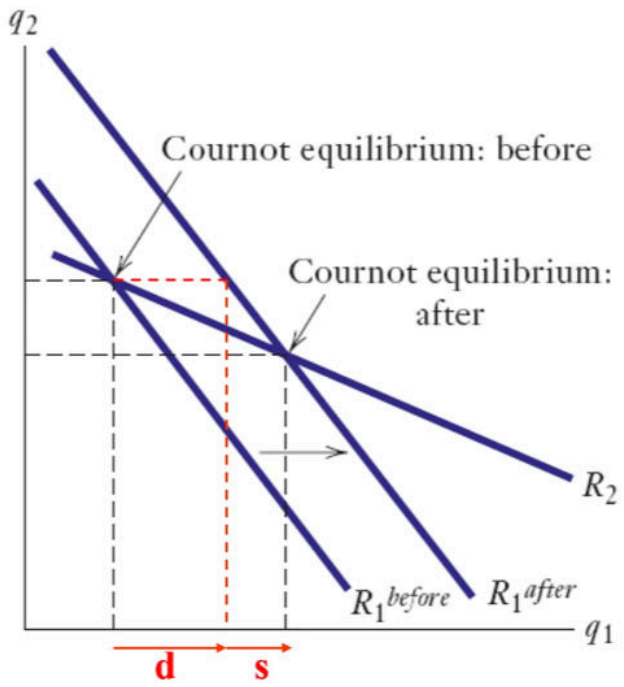
A **tough commitment** is a commitment with a disadvantageous effect on the competition (traditional vision on competition).

A **soft commitment** is a commitment with an advantageous effect on the competition.

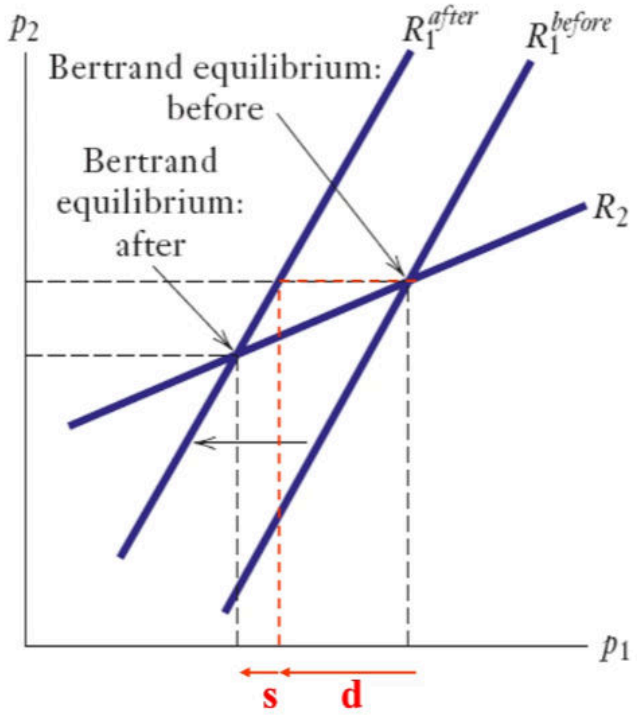
We will analyse this via a market with 2 firms. Decisions are made in 2 steps

- Firm 1 will make a commitment which is either soft or tough: reaction function moves.
- Both firms will respond until the equilibrium is reached.

Let's take a look at a tough commitment in a Cournot-market.



We can see the change of the reaction function of firm 1. This has a **direct effect**: which is the arrow d. There is also a **strategic effect** given by arrow s. This is because of the slope of the reaction function of player 2. In every situation, either tough/soft commitment and strategic complementary/substitution.
We can also illustrate a tough commitment for Bertrand:



In short, commitment results in both:

- The **direct effect**: the effect of the own strategy on the net present value of the revenue of firm 1.
- The **strategic effect**: effect of strategic decision of competition on net present value of the revenue of firm 1 after the commitment.

A firm should take both effects into account before making a commitment.

In general, commitments which lead to less aggressive behaviour of the competition have a positive strategic effect. Fudenberg en Tirole set up this model:

Commitment Posture	Nature of Stage 2	Commitment Action	Strategy
Soft	Strategic Substitutes	Refrain	Lean and Hungry Look[FT]
Soft	Strategic Complements	Make	Fat-Cat Effect[FT]
Tough	Strategic Substitutes	Make	Top-Dog Strategy[FT]
Tough	Strategic Complements	Refrain	Puppy-Dog Ploy[FT]

The value of flexibility

There are a few ways we can keep flexibility:

- Changing commitments when conditions change.
- Postponing commitments until there is more information.
- Loss in commitment today but option for additional commitment in the future.

A **real option** is a choice possibility to change a decision based on information in the future. Future actions will receive a financial value. This is the value of flexibility.
A few examples of real options are:

- Option to postpone a decision
- Option to expand
- Option to quit a project

Example:

- There are 4 periods. T=0 till T=3
- The initial investment is 60
- The discount rate is 10%
- There is a 50/50 change on either a good or bad market. The market will be revealed in t=1.

- The investment can done in t=0 or t=1.

Investment is done in t=0:

Payoffs	t=0	t=1	t=2	t=3
Good market	-60	50	50	50
Bad market	-60	10	5	5

The net present value of investing in t=0 =
0.5((-60+50/1.1+50/(1.1)^2+50/(1.1)^3)+(-60+10/1.1+5/(1.1)^2+5/(1.1)^3))=10.7>0

Investment is done in t=1

Payoffs	t=0	t=1	t=2	t=3
Good market	0	-60	50	50
Bad Market	0	0	0	0

The net present value of investing in t=1 (value of real option) =
0.5(0+(-60/1.1+50/(1.1)^2+50/(1.1)^3))=12.2>10.7

The total net value = (The net present value of investing in t=1) - (The net present value of investing in t=0) = 12.2-10.7=1.5

There is also a framework to empirically analyse commitments (by Ghemawatt). We will go more in-depth into this in the future:

- Positioning analysis
- Sustainability analysis
- Flexibility analysis
- Judgement analysis

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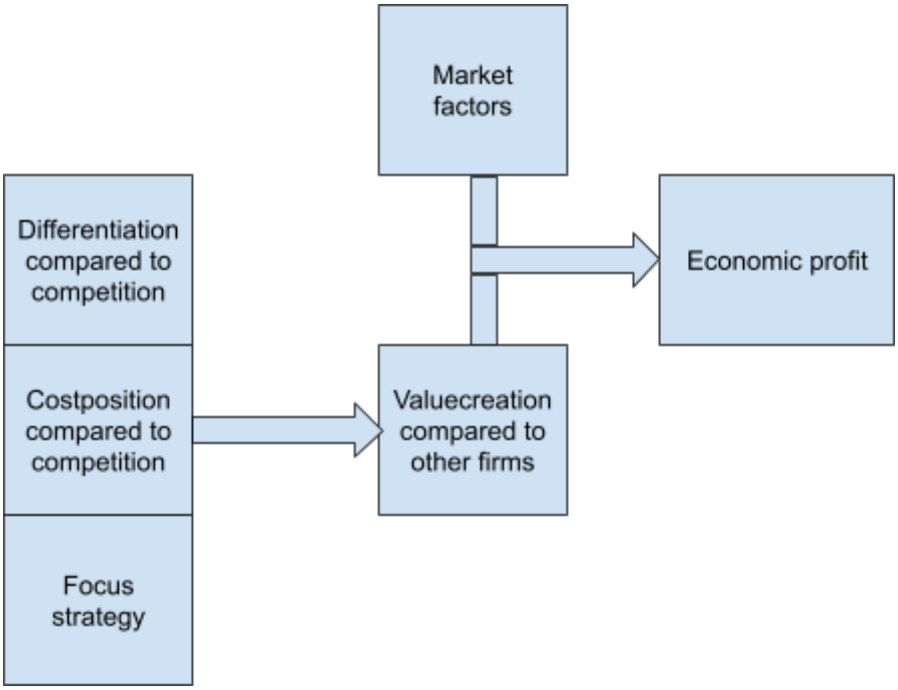
Strategic positioning and competitive advantage

Strategic positioning:

- Goal: The extent to which a company creates value and achieves competitive advantage over other companies depends on how it positions itself: the firm wants to create more value than their competitors.
- Firms in the same industry can position themself in different ways. Different strategic positions lead to different profits and thus different chances of surviving in the market. Therefore it is important to choose the right strategic position.
- Examples of strategic positions are: the best, what you stand for, innovator, product category, product specifications, emotion, experience, etc...

A **competitive advantage** is when a firm generates a higher economic profit compared to the average firm in that market. Economic profit depends on market categoristics and the success of a firm to create more economic profit than competitors. We will use a simple framework to analyse competitive advantages:



Creation of value compared to competition

In previous lectures we focused on market factors. We are now gonna focus on the creation of value compared to other firms.

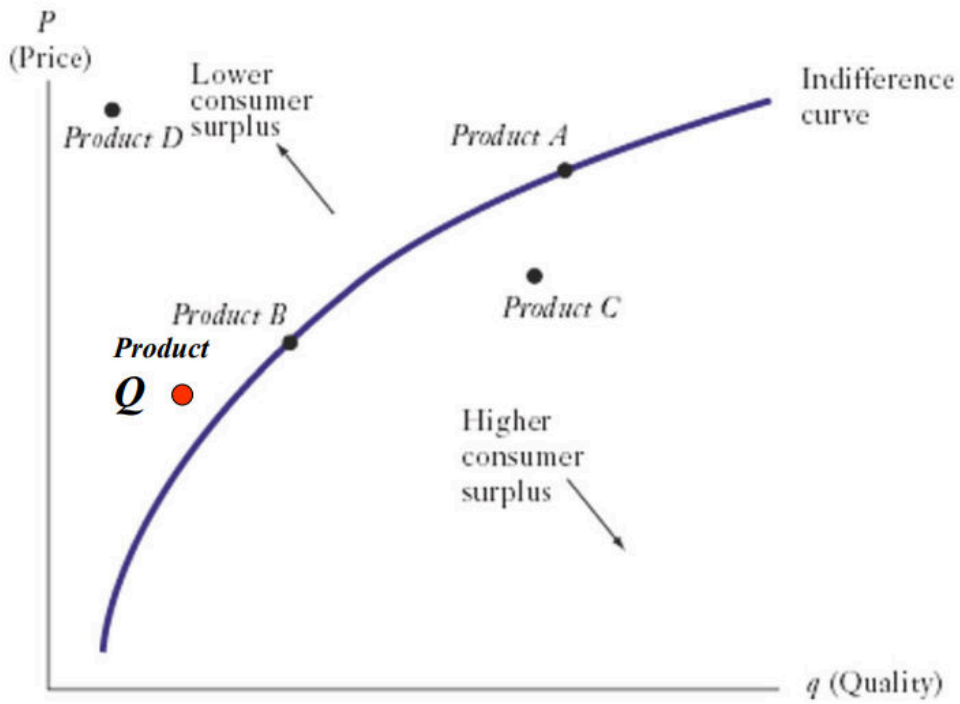
The **maximum willingness to pay** (WTP) is the price for which a consumer is indifferent between buying and not buying a good. This is the **implicit value of the final product**.

The **consumer surplus** is the difference between a consumer's maximum willingness to pay and the current market price. The consumer surplus needs to be positive when a product is sold. When a consumer chooses between two products he will choose the product with the highest product.
When a firm is not able to provide as much consumer surplus as its competitors it will lose customers.

There are two ways to increase the consumer surplus:

- Differentiation, increasing quality (max WTP)
- Decreasing the market price

We can plot indifference curves of consumers. This is illustrated below:



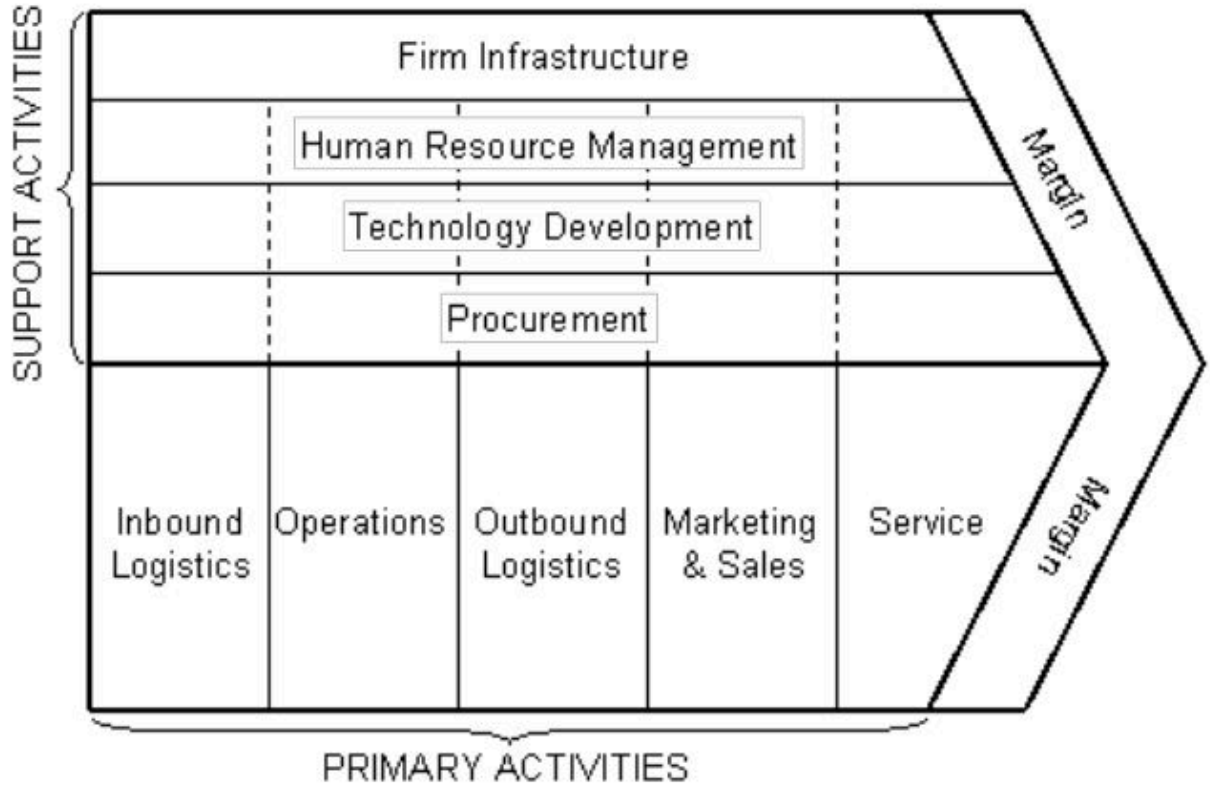
This consumer will have the following preferences: $C \succ A \sim B \succ D$.

The **created value** is the difference between the implicit value of the final product and the value sacrificed to transfer inputs to the final product.

- Max WTP = B
- Price = P
- Cost to make product = C
- Consumersurplus = B-P
- Created value = B - C = (B-P) + (P - C) = Consumer surplus + Producer surplus

Consumers will want at least the same surplus from a firm compared to its competition. With superior value creation a firm can supply consumers with the same amount of surplus and create more economic profit. Gaining this competitive advantage was the goal of strategic positioning.

The **value-chain analysis** represents the firm as a collection of its value creating activities. Every activity in the chain can be of potential value and has costs associated to it.



A firm can create a competitive advantage by:

- Re-configuring the activities in the value chain.
- Executing the activities in the value chain more efficient.
    - Only possible with unique **resources** (for example patents) and **capabilities** (for example superior acquisition of information)

In reality it is often hard to isolate the advantages and costs of each step in the value chain.

Competition strategies

Michael Porter: the generic strategy of a firm describes how a firm positions themselves to create value.
There are two main and one extra strategies:

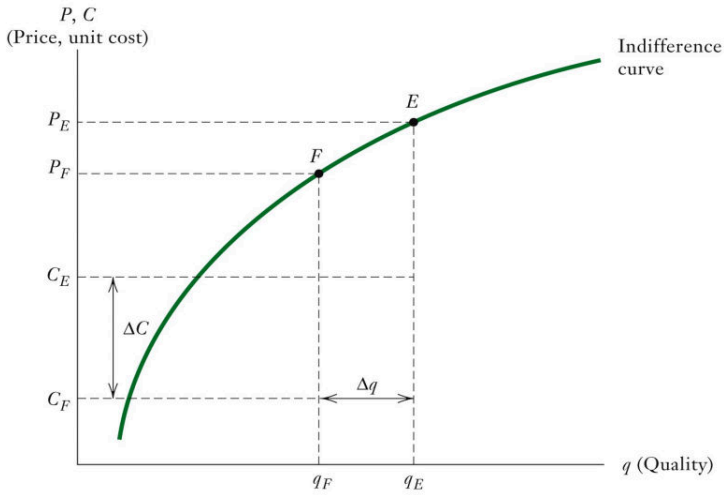
- **Cost-leadership**
- **Benefit-leadership** (differentiation)
- (+**Focus-strategy)**

Cost-leadership

Cost-leadership: a cost-leader creates a greater B-C by reaching a lower C than its competitors.

- Asking lower prices than its competitors and thus selling more
- Asking the same prices and reaching higher price cost margins.

We have illustrated the indifference below again. In the illustration F is the cost-leader and E is its competition.

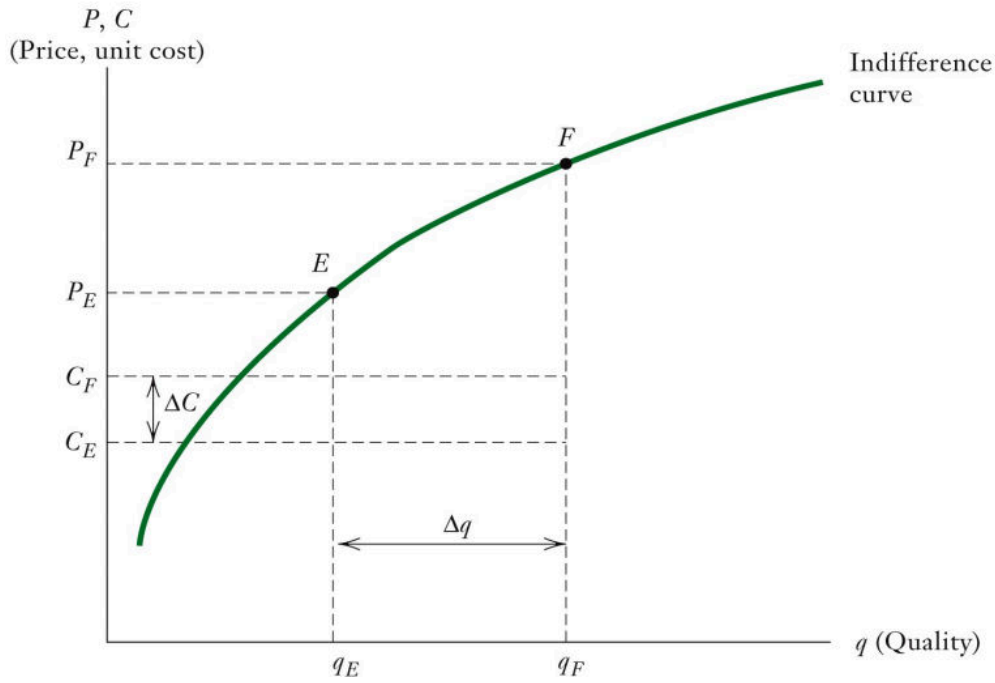


The strategy is that firm F offers lower quality and a lower price. The firm has because of the decrease in quality way less costs.
In this case: $C_E-C_F>P_E-P_F$ => $P_F-C_F>P_E-C_E$ => price-cost margin F > price-cost margin E.

Benefit-leadership

Benefit-leadership: a benefit-leader creates a greater B-C by reaching a higher B than its competitors.

- Asking the same prices and selling more because of a higher benefit.
- Asking a price premium for the higher benefit and thus reaching a higher price-cost margin than its competitors.



In this case the goal is: $P_F-P_E>C_F-C_E$ => $P_F-C_F>P_E-C_F$.

Cost-leadership vs. Benefit-leadership

Cost-leadership is a suitable strategy when:

- The nature of the product doesn't allow it to increase its value (for example oil).
- Consumers are relatively price sensitive
- It is a search good (quality of the product is already known before the purchase).

Benefit-leadership is a suitable strategy when:

- Consumers are willing to pay a premium for differentiation.
- Economies of scale are significant
- It is an experience good (quality of the product is only visible after purchasing it)

A firm can also implement a focus-strategy. This can be:

- Client specialisation: Focused on a wide range of products for a select group of customers.
- Product specialisation: Focused on a limited variety of products for a broad group of customers.
- Geographic specialisation: Aimed at exploiting the unique features of the region.

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Sustainable competitive advantage

As we saw in the last lectures, sustaining a competitive advantage is difficult due to imitation and innovation. However, it is not impossible.
A **sustainable competitive advantage** refers to a long-term competitive advantage that competitors cannot easily imitate or catch up with. This is done via:

- Differences in **resources** and **capabilities**
- **Isolating mechanisms** which can protect competitive advantage.

Resources & Capabilities

The **resource based theory of the firm** explains competitive advantage in terms of heterogeneity in resources and capabilities of firms.
For this theory it is important that resources and capabilities:

- Scarce
- Not perfectly mobile

    - **Cospecialization** occurs when two or more resources are more valuable when used together than separately. Their combined use creates synergies that wouldn't exist if they were deployed independently or with other resources. A resource may lose it's value when its moved.
- Not freely available

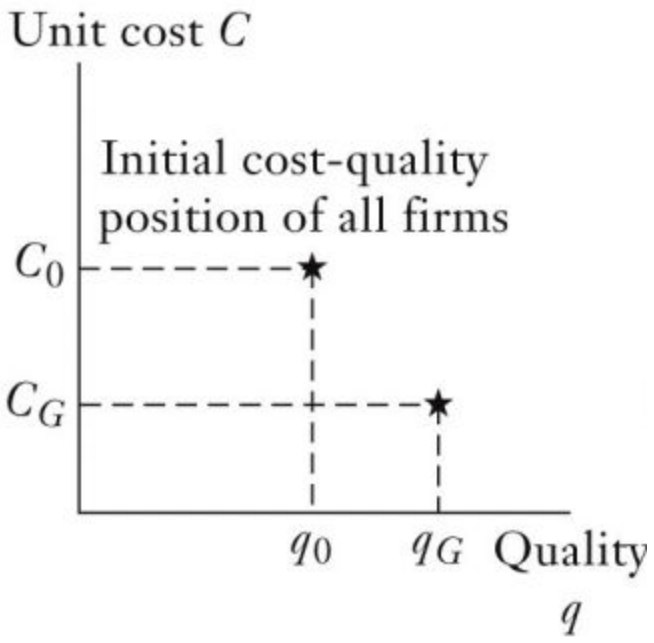
Resources are the assets of a firm, which includes the employees and brand. They represent the inputs in the productionproces of a firm.

- **Tangible resources**
    - **Organizational** resources (formal reporting structure, formal planning, controlling, coordinating)
    - **Physical** resources (plant & equipment, stock)
    - **Technological** resources (patents, trade-marks, copyrights)
- **Intangible resources**
    - **Human** resources (knowledge, trust)
    - **Innovation** resources (ideas, scientific knowledge)
    - **Reputational** resources (reputational with customers, brand name)

Capabilities is the capacity of a firm to implement a combination of resources. They are created over time via complex interactions between tangible and intangible resources. Capabilities are often based on the development and exchange of information and knowledge by informations.

Isolating mechanisms

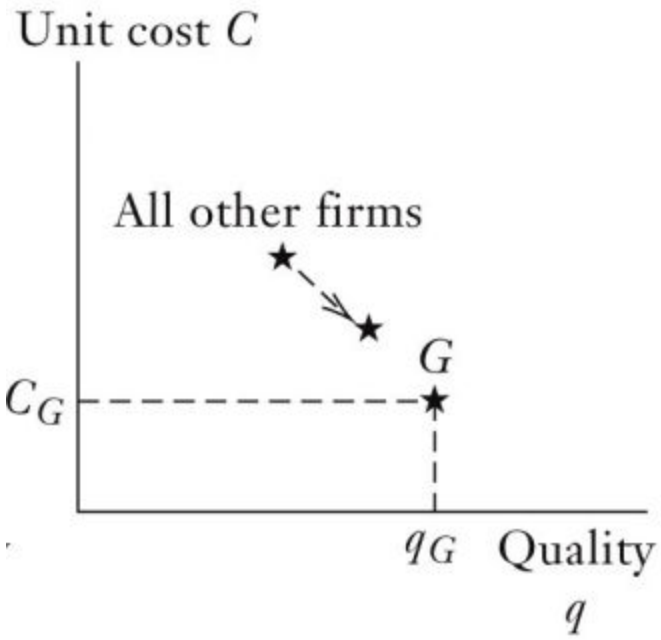
Isolating mechanisms limit the possibilities of competitors to decrease a firm's competitive advantage. Isolating mechanisms are the entry barriers for firms instead of markets.
There are two types of isolating mechanisms and we will explain them via the following shock. Firm G reaches a lower cost and higher quality than the other firms in an industry. This creates a competitive advantage:



Imitation-barriers obstruct entrants (of resources and capabilities) to imitate the resources and capabilities of incumbents. Four types are:

- **Legal restrictions** (purchasing patents or copyrights only yields economic profit for other firms, not firm G, if it is implemented in a superior manner.)
- **Superior access to inputs/clients** (only profitable when the purchase was beneficiary, **winners curse problem**)
- **Market scale & economies of scale** (effective when market demand can be met by one company)
- **Intangible barriers** (when the company's advantage lies in distinctive organizational capabilities)
    - **Causal ambiguity**: the superiority of firm G to create value cannot be perfectly understood.
    - **Historical dependence**: specific capabilities of the firm may depend on past situations.
    - **Social complexity**: competitive advantage is hard to copy when the advantage is in social complex processes.

Imitation barriers are illustrated below. It is hard for average firms to reach the competitive advantage which firm G has reached.



Early-mover advantages are advantages of which the economic value increases over time. Four types are:

- **Learning curve**: A company that sells more than the competition in the initial period learns faster and can save costs compared to the competition.
- **Reputation and customer uncertainty**: for experience goods, reputation for quality can be a valuable asset.
- **Switching costs**: switching suppliers has a cost. By being the early-mover firms lock their customers in.
- **Network effects**: when a client values a product more, when more people are using the product.
    - **Actual networks**: effect depends on the amount of clients already using the product.
    - **Virtual networks**: are created by the use of complementary goods (Apple products which work better together).

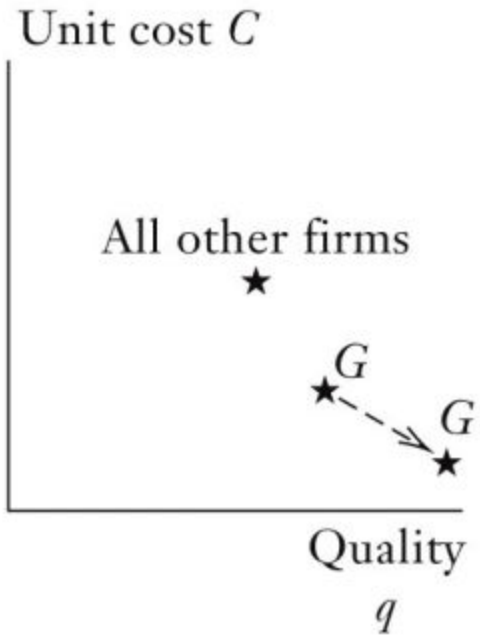
One disadvantage of being an early mover is that later entrants can learn from the early mover's mistakes. In many cases, followers ultimately outperform early movers by entering with improved strategies and technologies. Additionally, early movers may struggle due to the absence of virtual networks.

Lots of networks are based on standards. Standards are hard to change. Possibilities are:

- Supplying superior quality or new options
- Attract early-adopters

When there are high costs of changing standards, you should accept the standard.

Early-mover advantages are illustrated below.



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Creating competitive advantage

We can **create competitive advantage** by anticipating on unmet needs of consumers in the future. This can be done via:

- Investing in the development of new products.
- Investing in capabilities to produce and distribute these products.

In general you want to be the first producing a product. Therefore you need innovation.

Definitions of **innovation** include:

- “The act of introducing something new”.
- “The ability to deliver new value to a consumer”.
- “Change that creates a new dimension of performance”.

Innovation has two dimensions:

- **Product innovation**: introduction of a new product or a product of increased quality.
- **Process innovation**: introduction of a new production method.

For these dimensions there are two types of innovation:

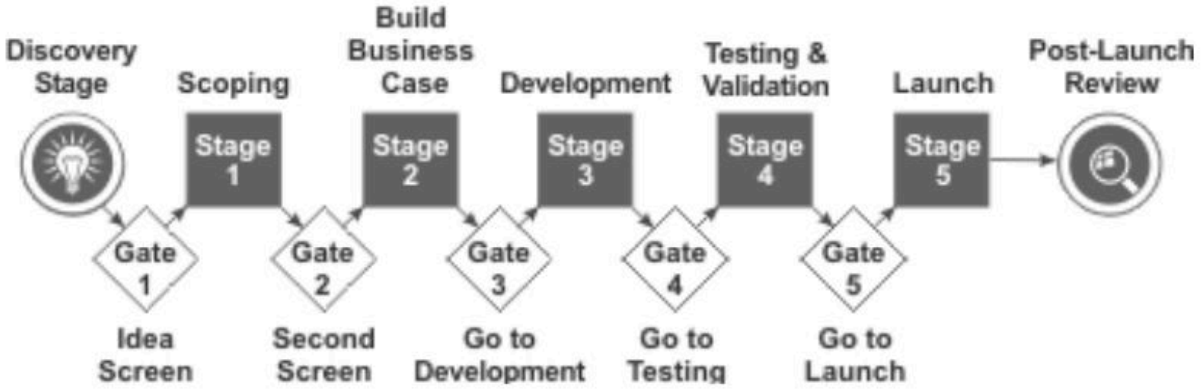
- **Incremental innovation**
    - Based on existing knowledge and resources.
    - Improves existing competencies.
    - Relatively small changes in performance.
    - Occurs often (new microchips in PC’s).
- **Radical innovation**
    - Demands new knowledge and resources.
    - Existing competencies will probably lose their value.
    - Leads to potential major chances in performance.
    - Does not occur often (invention of the internet).

It is often hard to distinguish between incremental and radical innovation.

Innovation is created via the following scheme from a) to c).

a) Information	b) Knowledge	c) Innovation
Explicit (formalised) or implicit (knowledge).	Absorption capacity = ability to absorb information and process it into knowledge.	Capacity to transfer knowledge to a knew product or process.

An illustration of the process behind innovation is illustrated below. This is the **stage-gate process model.**



Creative destruction

Innovation can be seen as a shock (fundamental change which leads to changes in competitive advantage in a market). Competitive advantage occurs for the firms which are capable to exploit shocks. They do this via introducing innovative products.

We now will introduce the idea of **creative destruction**:
An important idea for creative destruction is that new sources of competitive advantage follow up old sources. Innovation will increase the consumer surplus:

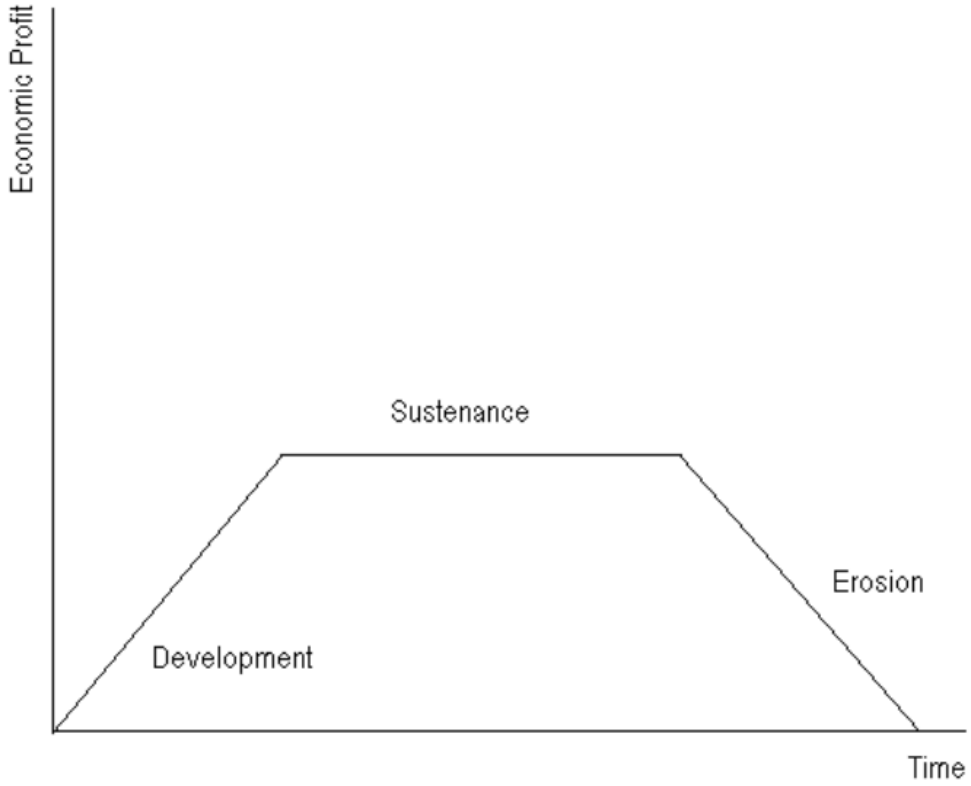
- Lower costs of a product.
- Quality improvement of a product.

A market has periods of sustenance interrupted by shocks and discontinuities. Shocks are radical innovations and discontinuities are small shocks via incremental innovations.

Disruptive technologies: a market is cleared of less efficient processes and organisation structures. This leads to a higher B-C, because of a lower C. Therefore:

- Isolating mechanisms don't work forever.
- Life span of competitive advantage decreases when technology and preferences changes quickly.

The process of creative destruction is illustrated below:



In periods of sustenance firms with superior products and technologies will have a competitive advantage.

In some industries competitive advantages are only for very short periods of time, because of **hypercompetition**. Firms in markets characterised by hypercompetition will constantly look for new sources of competitive advantage. Their strategy will be to innovate constantly.

The idea of creative destruction is consistent with Schumpeters thoughts (lecture 7)

- Technological development and long-term economic growth (**dynamic efficiency**) are more important than the optimal allocation of resources at one point in time (**static efficiency**).
- Society benefits more from competition between products, new technologies and new organisation structures than price competition.

These ideas can be used to defend monopolies over perfect competition.

Why innovating?

Innovators dilemma: Investments in innovation by established firms erode their own successful business model, while failure to innovate can lead to entry.

Incumbents can refrain themselve from innovation, because of:

- **Sunk-cost effect**: Profit maximizing firm stays with the current technology while a profit maximizing firm that enters would choose a different technology.
- **Replacement effect**: Despite equal innovative capabilities, an entrant is willing to invest more to develop an innovation. The reason for this is that an entrant can become a monopolist, but a monopolist can only replace itself.

Incumbents can choose to innovate, because of:

- **Efficiency effect**: A monopolist generally has more to lose from an entrant in its market than that same entrant has to gain by actually entering.

All three effects have a role in the innovators dilemma.

- When the chance on innovating for potential entrants is low the sunk-cost and replacement effect will dominate (don't innovate).
- If potential entrants are likely to respond when the incumbent firm does not innovate, then the efficiency effect will dominate.

Keep in mind that ideas and technologies can also be sold. The **innovator** has a negotiation power and can generate the entire economic value when:

- The technology is protected by patents.
- The knowledge which is necessary to push a product in a market is not scarce.

If this isn't the case, this will push the negotiation power to the firms with knowledge to produce a market.

Competition and innovation

In lots of case the "**winner takes it all**" for innovation. The size of a firm is therefore very important.
Productivity effect: a big firm can sometimes make use of economies of scope and be more productive in their research. Without economies of scope a firm can experience disadvantages of their research approach.

When firms stay ahead of competition, this can lead to disproportional advantages:

- Protection of innovations by patents.
- Early-mover advantages.

This leads to **patent races**.

Often there are different methodologies available for innovation which affect the chance of success.

- Different methodologies can have different risk.
    - Eg: The date of completion can be different.
- There can be correlation between methodologies.
    - Eg: Many same methodologies lower chance of success.
- Correlation between methodologies or research approaches can be a problem for large companies.

Sustainable innovation capacity

Sustainble innovation capacity depends on:

- **Dynamic capabilities**: ability of the company to maintain and adapt the capabilities that underpin its competitive advantage.
    - **Exploitation**: exploit current capacity.
    - **Exploration**: explore new markets, technologies and products.

Keep in mind that not all innovations are as successful. Therefore it can be hard to predict a value of a firm based on investments in innovation.

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