

MANAGEMENT CONTROL AND COST MANAGEMENT

SESSION 1

MODULE 1: INTRODUCTION TO COURSE

What is Accounting?

Accounting is the language of business (Warren Buffet). Through accounting we understand, assess, and communicate about business.

- **Accounting:** recording, analyzing, summarizing, and reporting business transactions mainly in the financial terms.
- **Accounting system:** a particular way a company does accounting.

Two key purposes of Accounting system

1. **External reports: banks, shareholders, tax**
For financial accounting and tax purposes. Sometimes for executive compensation.
2. **Internal reports: managers**
Profitability of products, info about inefficiencies, resource allocation, rewards, performance evaluation, etc.

Why two different systems?

The purposes are not always aligned:

- What is required for tax reporting may not be the best information we need for (internal) decision making.
- Avoiding disclosure of strategic information → Proprietary costs!

IFRS mandates firms to disclose information about their segments → Segmental reporting → By geographic region or by product level (or both). BMW reports its sales by product type not geographic region to avoid disclosing strategic information to the competition. Proprietary costs! Little info value; of course, most profits are realized on selling cars!

Financial vs. Managerial Accounting

	Management Accounting (internal reporting)	Financial Accounting (external reporting)
Audience	Managers	External agents, e.g., suppliers, clients, banks, analysts, shareholders, investors
Regulations	Organization specific, customized, with some legal restrictions, but no regulation.	Guided by prescribed accounting principles. It is compulsory for all organizations.
Horizon	Reports historical and current information and provides information on expected future performance and activities.	Provides information about the past period.
Reporting Frequency	Variable reporting interval: monthly, weekly, hourly, ad hoc analysis...	Annual reporting (semi-annual and quarterly reports also exist in some companies)

Managerial accounting is important in many decisions: Pricing, make-or-buy, decide for special orders, decide to whether or not invest in a region or product, decide about continuing a product line or not.

Key roles of managerial accounting:

- 1) **Decision facilitating role:** Provision of information to reduce pre decision uncertainty (Demske & Feltham, 1976; Sprinkle 2003). Aim: improve employees' knowledge so that they can make organizationally desirable judgments.
- 2) **Decision influencing role (control):** Use of information to motivate employees and align their interests with those of the firm (Demske & Feltham 1976, Sprinkle 2003). Aim: influence (control) employee behavior.

Examples of managerial accounting information: budget information, sales targets, goals to achieve, results of variance analyses, customer satisfaction, safety measures, cost information to marketing & sales managers for pricing and profitability analysis

Trade off between control & decision facilitating roles

Salespeople at a particular firm forecast what they expect to sell next period. Their supervisors then review the forecasts and make revisions. Based on the forecasts, production and purchasing plans are made.

- What will salespeople do if they receive a fixed bonus of 20% when exceeding their revenue targets?

This firm tries to use the forecasts for two functions: decision making and control. In deciding on next year's production plans, sales people's forecasts of future sales are important → LOCAL KNOWLEDGE

Using the sales target for the control purpose (motivating the salespeople to achieve their goals) leads to:

- Underestimation of the target
- Reducing the usefulness of the sales target as a decision-making tool to set production plans
- Other departments start planning on the wrong figure!

In simple terms, cost accounting/cost management is a sub set of management accounting. Cost management is about estimating, allocating and controlling costs. It addresses questions such as:

- How much does our product/service cost? How much does each Master's student cost the university?
- How to reduce our product costs?
- How to calculate our product costs?

EXAMPLE: You have a house. You have rented it to three families. Imagine that the heating system and electricity are centralized. You recruited one person to clean the corridors, common areas, and garden. You have also made a contract with a company to do maintenance.

- How would you allocate these costs to your renters?
- Do you think the way you allocate the costs would impact your renters' behavior?
- Could the way you do accounting change the total costs?
- How could you reduce the total costs?

You can extend the house example to a company. How would you consider different costs (IT costs, after sales service, HR costs) in calculating the costs of the company's products and services? The question becomes more difficult when there are multiple cost sources and multiple products.

Determinants of internal accounting system design

The level of competition a company faces can impact the design of the costing system.

Competition after DRG affects hospital willingness to invest in cost systems in case hospitals compete on price not when they compete on quality

- Environmental forces and firm strategy affect the design of internal accounting system. Accounting system is not isolated from other systems.

Design of accounting systems depends on:

- External factors, e.g., nature of competition (Krishnan 2005; Sandino 2007)
- Firm strategy or strategic orientation (Krishnan 2005; Sandino)
- CEO or CFO characteristics: CEO / CFO style (Naranjo Gil et al. 2009)
- Firm characteristics: age, maturity of the company (Davila and Foster, 2005)

Why are sometimes (apparently) inferior accounting systems in place?

Econ. Darwinism: If a system survives → Benefits > Costs over long run

- Inaccurate costing, simple cost drivers sometimes beneficial (Dearman & Shields, 2001)
- Conflicting goals; e.g., tax issue (external), important behavioral motivation consequence

Not optimal/economically efficient

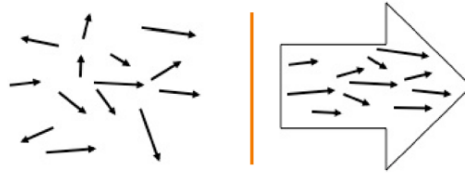
- Better systems may exist, but have not yet been discovered; Some systems are legitimate (reach consensus) for different stakeholders (Meyer and Rowan)

MODULE 2: Introduction to Management Control

Big Challenge: Strategy Execution

Strategy execution is the number one challenge for CEOs around the world (Asia, Europe and the United States) (Sull et al. 2015, Harvard Business Review). Approximately, 2/3 to 3/4 of large organizations struggle to implement their strategies.

Why strategy execution is so challenging? Because it is about people (Bregman 2017). People make things happen. Understanding, predicting, and influencing human behavior is difficult.



How to get from the left picture to the right picture? (Bregman, 2017)

Management Control:

- **Influencing employees** to make decisions that allow for implementation of organizational strategies and achievement of goals.
- **Management control systems (MCSs):** all tools, devices, and systems that managers put in place to influence employee's behaviors and align them with the organizational goals and strategies. Examples: budgeting systems, performance measurement & compensation systems, planning systems.

Control is one of the key functions of management along with two other functions: **setting organizational objectives and strategy formulation.**

- **Objective setting:** what the organization wants to achieve.
- **Strategy formulation:** how to use resources to meet the objectives.
- **Management control:** strategy execution with the behavioral focus.

Do employees act appropriately in line with the organizational strategy so to achieve organizational objectives?

- These functions are interrelated and inform each
- Strategy is not always planned. Strategy can emerge from the series of interactions between managers, employees, and environment.

Causes of control problems

- **Lack of direction:** Maybe employees don't know/understand what the organization wants from them.
Solutions: Clear communication of organizational goals and job expectations.
- **Motivational problems:** employees' interests are not always aligned with the organizational ones (conflict of interests, goal incongruence, agency problem)
Solutions: Alignment of interests through offering monetary & nonmonetary incentives, ingraining values.
- **Personal limitations:** lack of ability to perform, cognitive limit (limited capability to process information properly)
Solutions: Training, investment in selection (choosing an appropriate person for the job), better job design.

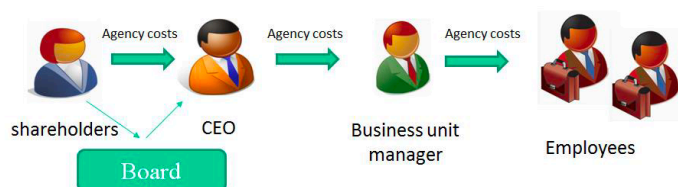
Agency theory (Jensen and Meckling, 1976): Agency theory is about settings in which one party (the principal) hires another party (the agent) to perform a service (act) on their behalf → The principal agent relation.

- The agent pursues her/his self interest instead of the principals' interest. → Agency problem
- The agent is self interested

Agency problem causes agency costs:

All costs that the principal must bear while hiring an agent:

- 1) Costs of managing the principal agent relation: monitoring, making a contract, information search, incentives, ...
- 2) The agent uses the principal's resources in her/her interest



Agency problem exists in all organizations and in all cooperative efforts, at every level of management in firms, universities, mutual companies, cooperatives, governmental authorities and bureaus, and unions.

Agency problems

- **Hidden information (asymmetry) → Adverse selection:** Prior to contracting, agents have better private information than principals. Solutions: pre contract investigation, post contract penalties.
- **Hidden action → Moral hazard:** After contracting, agents have an incentive to deviate because the principal cannot readily observe their actions (hidden action or hidden information) (e.g., shirking on job) Solutions: inspecting, monitoring, target setting, performance-based incentives.
- **Employee theft:** Employees use firm resources for unauthorized purposes. Solutions: Buy fidelity bond, monitoring, inventory control, installing whistle blowing systems, etc.
- **Empire building:** Managers seek to manage larger number of employees/funds to increase their own job security or compensation. Solutions: Modify incentive contracts, benchmarking of CEO pay, etc
- **Horizon problem:** Agents expecting to leave place less weight on the long-term interests of the firm. Solutions: Long term incentives, bonus bank, monitoring, etc.

Key control problem in teams is free rider problem in teams: Individuals form teams (firms) because they can produce more in a team compared to doing alone (positive synergy). However, team production can create control problems. **Agents** are likely to shirk because their individual efforts are not directly observable. The **principal** only observes the total output.

Solutions: peer monitoring, between group competition, cultural control.

A typical organization loses 5% of revenues due to fraud. Control failure can be too costly! It can threaten a firm survival and can lead to reputational damage, financial loss, or even organizational failure.

How to address control problems?

Some avoidance strategies: to eliminate the possibility that a control problem occurs

- **Activity elimination:** subcontracting activities that can create control problems to an external party: use of cloud services so that data security and protection would be provided and controlled by another company.
- **Automation:** using robots, computers, and expert systems to eliminate human problems of inaccuracy, inconsistency, or lack of motivation.
- **Centralization:** eliminate the possibility that lower-level employees make decisions that are not in the best interest of the organization.
- **Risk sharing:** buying insurance against certain large losses that an organization may face. For example, purchasing fidelity bonds on employees in sensitive positions (such as bank tellers) to reduce firms' exposure to control problem.

Design of management control systems

Organizations cannot avoid all control problems, but they may be able to avoid only some of them or reduce the potential loss of control failure. To address the control problems that cannot be avoided, we need good management control systems in place.

SESSION 2

MODULE 3: MANAGEMENT CONTROL ALTERNATIVES

"Execution is the result of thousands of decisions made every day by employees acting according to the information they have and their own self interest." (Neilson et al. 2008, p.62)

Zimmerman's control framework:

- Decision making rights
- Performance measurement
- Reward systems

Who should decide?

Delegation of decision-making rights:

- Centralize decision rights with top executives
- Decentralize decision rights to lower levels

Why delegation of decision making?

Linking knowledge and decision making is often key!

- Specialized knowledge is costly to acquire, store, process and transfer
- Faster response to changing circumstances due to shortened lines of communication/decision making
- Limited (cognitive) resources (free up brain space to focus on the most important decisions)
- Increasing intrinsic motivation and trust
- Excellent training (with limited risks for the firm) for future top-level executive

Risk of delegation of decision making rights:

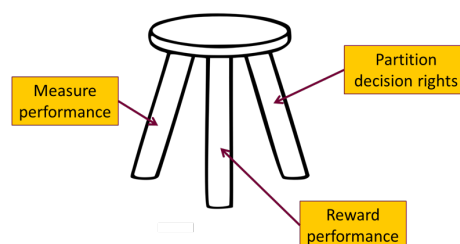
- Losing control → increasing agency costs
- If keeping control is more important than improving decision making quality → "do not delegate" unless there are proper control tools in place.

EXAMPLE:

- Knowledge and decision rights are linked. Delegation does not significantly increase agency costs. For example: A machine operator schedules own machine.
- Knowledge and decision rights are not linked. Delegation can be costly. For example: Sales representatives know customer's demand curve the best, but only sales manager approves final sales price. Giving pricing decision rights to representatives may result in customer kickbacks.

Zimmerman's control framework: Alignment between three systems

- A good performance measurement and reward system should match the decision-making right system.
- Desirable performance (the results of good decision makings) should be defined, measured, and rewarded.



Control types (Merchant & Van der Stede)

Categorizing controls depending on the object or focus of control.

- **Results control (output control):** Do employees produce the desired results?
- **Action control (behavioral control):** What actions should employees do?
- **Personnel control (input control):** What type of people should we hire?
- **Cultural control (clan control):** What common norms and values should be in place?

Results controls: Providing inexpensive control even when the knowledge about desirable actions is not available. The key feature of results control is that it keeps individuals' autonomy → higher intrinsic motivation.

- **Providing directions:** Inform employees what they are expected to do and providing clear feedback about how they are doing (gap between performance and expectations).

- **Improving motivations:** Employees get a sense of accomplishment when they produce the desired results. The motivation effect is stronger when monetary rewards are linked to performance.
- **Personnel limitations:** They help the organization to attract and retain competent employees and even motivate them to develop their skills to be able to achieve the rewards.

Elements of results controls:

- 1) Defining the dimensions on which results are desired
- 2) Measuring performance in the chosen dimensions
- 3) Setting performance targets for employees to attain each measure
- 4) Providing rewards for target attainment

Results controls are very common at the management levels, but not necessarily limited to them as they can also be used in the lower organizational levels.

EXAMPLE: Look at the compensation system at Lincoln Electric (this is in place since 1934). Lincoln is a successful manufacture of welding products with high productivity. The company performed so well that General Electronics could not compete in this product line and had to exit the market.

Only piece rate wages, no base salary!!!

Preliminary conditions for the effectiveness of results controls

1) Organizations know and can easily communicate what results are desirable.

The disaggregation of overall organizational objectives into specific expectations for employees at different hierarchical levels is difficult. If wrong results are chosen (incongruent with the organization's intended objectives), wrong actions will be motivated. → Results measures should be congruent.

2) Employees can significantly influence the results for which they are accountable.

The principle of controllability: employees should be able to affect the results in a material way. This is an important principle of responsibility accounting.

Rationale: if desired results are not controllable, they don't provide much information about actions and decisions taken. It would become difficult to attribute results to employees' actions or external factors.

3) Organizations should be able to effectively measure results.

Results measures should be:

- **Precise** (free of measurement errors, whether random or systematic)
- **Objective** (unbiased, free of interpretation, emotions, personal)
- **Timely** (small lag between the employees' performance and the measurement of)
- **Cost efficient** (should not be too costly to develop or)
- **Understandable** (employees must understand what a measure represents and how it is calculated)

Action control: The action control is the most direct management control: Ensuring that managers take actions aligned with the firm's interest by focusing on actions.

- **Behavioral constraints:** making actions that employees should not do difficult or impossible (addressing the motivational problem)
- **Precaution reviews:** reviewing (approval, disapproval, or asking for modifications) action plans and proposals.
- **Action accountability:** holding employees accountable for the actions they take.
- **Redundancy:** assigning more employees to an important task than is necessary. This ensures that a task will be reliably completed, e.g., security function

Behavioral constraints: Physical constraints (restricting access to areas or facilities, information by setting passwords, identification cards, fingerprint readers)

Administrative constraints

- Placing limits on rights to do specific actions, for example, setting a limit for decision making authority, for example, up to the certain amount of expenditure
- Limiting discretion particularly for those decisions that may incur high influence costs. For example, limiting choices through setting policies, bureaucratic rules, or procedures.

Influence costs: lobbying and politics that are done to influence the decision making which can waste a firm's resources.

Example: Decisions that have huge effects on employees' welfare. Airlines often allocate routes to flight attendants based on seniority. There is no supervisor deciding who gets which route.

Behavioral constraints (separation of duties)

Making sure that one single person does not complete the entire task on his/her own.

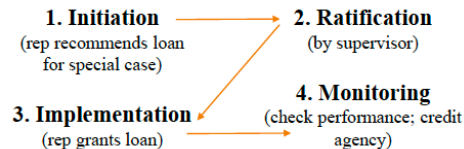
Reason: If all concentrated in one function, then the risk of inappropriate behavior is higher.

E.g., an employee who makes the payment entries in the accounts receivable ledger should not be the same one who receives the checks.

Note: Separation of duties is not enough to remove the possibility of collusion between two people in charge of check receiving and payment entry, respectively.

Separation of management and control

Separation is particularly important for actions with large impacts across many agents, such as employee hiring, plant construction (new investments), etc. Hierarchical structure of organizations allocates the decision rights about each part to different agents.



Action Accountability

- 1) Defining what actions are acceptable or unacceptable.
- 2) Communicating the defined actions to employees through rules, procedures, or company codes of conduct, checklists.
- 3) Observing and tracking employees' actions: direct monitoring, activity reporting
- 4) Rewarding right actions or punishing wrong actions.

Advantech's in vehicle computers: truck drivers are tracked by GPS device & sensing machines and get notices if they violate the rules.

Action control (preventive or detective)

- **Preventive controls:** does not allow for undesirable behavior (most powerful form of control)
- **Detective controls:** it highlights the error/wrongdoing after its occurrence and asks for correction

Example: Fastening the seat belt:

- Preventive control: does not allow the driver to drive unless the seat belt is fastened.
- Detective control: keep buzzing while a seat belt is not fastened

Preliminary conditions for the effectiveness of action controls

1) Knowledge of (un) desirable is available

This knowledge is feasible in many jobs or can be learned over time. However, for the complex tasks or in uncertain environments, this knowledge is often accessible only ex ante. (e.g., R&D units).

2) Ability to ensure that desirable actions are taken

There should be ways to observe, track, or infer what actions employees take. Otherwise, there is no way to understand whether employees behave in line with rules or procedures or not.

Action control (pros and cons)

- Accumulation of knowledge and learning: policies and procedures document what works best. They can transfer knowledge to new employees easily and efficiently.
- Action control may not be feasible. Knowledge of desirable actions exists only in specific situations (e.g., routinized tasks).
- Action control may focus on easy to observe and probably less important actions, it may ignore more important actions but hard to observe or track => behavioral displacement
- Action control may make employees sloppy or resistant to change

e.g., promoting "check the box" mentality. For example, some airplane accidents are due to careless rushing through pre-take-off procedures.

e.g., employees may not pay enough attention to changes and rely on written rules to do the task.

Personnel control: Choosing the right people for a job at hand, helping them to develop, and providing enough resources for them to do a good job.

- **Selection and placement:** finding the right employees (having the skills that match the job requirement and having values, beliefs, and personality that match the organizational values and culture)

- **Training:** formal or informal training through mentoring to increase the likelihood that employees do a good job and be able to overcome the challenges.
- **Job design and resourcing:** jobs should be designed in such a way that enables success.

Sometimes, an employee is motivated and competent, but s/he is not given resources required to do a good job. Sometimes, workload is so much that achieving a good performance is hardly likely.

Cultural control: Culture can differentiate an organization from its competitors. It can impact how the organization operates and how employees work.

Culture: Common and (implicitly) assumed values, beliefs, ideologies, or ways of behaving in the group/the organization.

How to influence culture: codes of conduct/ Events, e.g., celebration of achievements/physical arrangements: office plans, architecture, social arrangements: using unique dress codes, or vocabulary/tone at the top: top manager's words and behavior; how the top manager communicates with employees.

Importance of Peers (colleagues)

The cultural control was initially proposed by Ouchi 1979 as “clan control“ in management control literature.

Evidence of peer monitoring in self-managed teams: Some teams can function and manage themselves without having a manager.

- **Peer effect:** employees are affected by their colleagues' behavior. (e.g., Mas & Moretti 2009)
- **Peer monitoring:** employees observe and monitor each other's actions and performance and punish those who deviate from the group norms (e.g., peer pressure, tendency to conform to the group norms).

Bundle of controls

Controls (results, action, cultural, personnel) can be independent, substitutes, or complement. Recent research in management control considers different control practices as a package or a bundle (a set of control practices). Each control practice does not act in isolation and is not necessarily individually effective. Control practices can operate together.

The return of one control may depend on the other control system in place. One control practice may reinforce or weaken the effect of another one (Moers and Grabner 2010). For example, the effectiveness of one results control may depend on the cultural control in place.

MODULE 4: CONTROL SYSTEM COSTS

No control system is free of costs

Direct costs:

- Monetary costs of designing and implementing control systems, e.g., installing a camera for monitoring or an information system or a performance measurement system, cash bonuses, maintaining an internal audit staff.
- Managers' time spent on monitoring of the subordinates' activities, reviewing pre actions, ...

Indirect costs:

Harmful side effects of control: unintended consequences/effects

- Behavioral displacement/operating delay/gamesmanship/ myopia, short termism/ negative attitudes towards the firm/reducing intrinsic motivation/producing destructive work environment

Larkin & Pierce 2015 → inseparability of functional & dysfunctional effects of compensation contracts.

- Adaptation costs (adjusting controls to new situation)

Behavioral displacement

The most common side effect of control systems. When MCS encourages behaviors that are not aligned with the organization's objectives.

- Behavioral displacement in case of results controls: employees would maximize their measured performance in a suboptimal way. → Most of the time it is because of rewarding incomplete measures.
 - Offering bonus based on sales revenue, e.g., employees sell products that are easy to sell and do not sell new products.

- Offering rewards to computer programmers for their output measured in lines of code per day. Programmers generate lengthy codes even though simpler codes are easier to understand.
 - Evaluating researchers based on the number of patents. Researchers focus on the number of patents, but at the costs of reducing their quality.
- Behavioral displacement in case of action controls: too much focus on the actions employees are supposed to do (means) and lose sight of what they should accomplish (the ends).
 - Blindly following the action control and failing to think independently or adapting to new settings.
 - Tick boxing mindset

Gamesmanship (Arranging slack)

- **Slack:** consumption of organizational resources more than what is required to achieve the organizational objectives. Slack is not necessarily bad, it can reduce stress or allow for adaptation in case of change, but it can distort resource allocation decisions and reduce efficiency.
- **Budgetary slack:** negotiating more easily achievable targets → increasing the likelihood of attaining the target and associated rewards (bonus, promotion)

Gamesmanship (Data manipulation/Measure management): Manipulating performance information through accounting or operating means. Manipulation of earnings is called **earnings management**.

- **Accounting method:** intervention in the measurement process or misreporting. Shift from accelerated to straight line depreciation.
- **Operating method:** altering operating decisions. Delaying the timing of discretionary expenditures and/or accelerating sales to increase revenues. Operation distortion can have adverse effects on real economic value and the long-term firm performance.

Manipulation can be a serious problem → Rendering the entire control system ineffective

Operating delay: When a control system causes bottleneck in the processes and thus lead to a cumbersome structure → Bureaucracy. Bureaucracy can promote gaming behavior where people try to find ways to pass the bureaucracy. For example, they first invest in a project and then they seek the required approval.

Negative attitude

- Job stress, frustration, pressure to perform → negative impacts on performance or encouraging dysfunctional behavior
- Control being perceived as a sign of distrust (Falk & Kosfeld 2006) → negative attitude toward the firm and lack of commitment
- Creating perception of unfairness

Reducing intrinsic motivation

- In order to discipline behavior, a firm implements a control system: incentives, punishments, rules, but these controls can crowd out intrinsic motivation and therefore we may lose people who are intrinsically motivated

Think twice to impose a control if most employees are intrinsically motivated or if employee creativity and entrepreneurship is essential for success.

Creating a bad working atmosphere

- Fostering social comparison and creating unhealthy competition
- Making employees more self-interested → Reducing prosocial/cooperative behavior, hiding information, engaging in politics, talking behind each other's back, sabotage, ...

VW Scandal as an example of diffusion of responsibility

- *"Are we victims or perpetrators? Neither. I knew but I did not prevent it... and I am still mad with myself. Absolutely."*
- People are less likely to take the responsibility for the situation at hand in the presence of others (Bystander effect).
- People are more likely to act unethically when they are in a group than when they are not (Kocher et al. 2019).

Culture at VW

"A mindset in some areas of the company that tolerated breaches of rules." Notice that people's mindset can be changed quite easily. Which cultural elements are particularly important to maintain an ethical environment?

- Creating a culture where people can easily talk about what went wrong and what could go wrong (Psychological safety).
- Creating a culture where honesty is as important as power if not more.

MODULE 5: CONTROL SYSTEM DESIGN (MAINTAINING EFFECTIVE CONTROL)

How to reduce the side effects of control?

Many control systems that promote productive behaviors can also promote counterproductive behaviors (Larkin & Pierce 2015). The benefits and side effects of a control depend on how people will perceive it and react accordingly. Focus on how your employees will understand your control system.

The more controlling people perceive your control system, the more serious its potential adverse effects → give employees choice and ask for their input.

Designing control systems

Think about what behavior your system will ideally motivate, but try to assess what is likely to happen: how people likely behave? A lot of research has conducted on how to reduce the dark side of control. Yet, there is still a long way to go!

One good framework to analyze a control system is:

- Enabling versus coercive control (Adler & Borys 1996)
- How to design a control system in a way that can enable employees to do their job better?

What are the key features of an enabling control system? (Adler & Borys, 1996)

- Internal Transparency
- Global Transparency
- Repair
- Flexibility

Trap 1 - One size fits all: People may perceive and react to a certain control system differently. Reaction might be different across cultures, hierarchical positions, tasks, There is no one single best way to keep good control. Customizing the control system to your setting is important for its effectiveness. Invest to know your people and the context (organizational culture, independencies) before designing a control system.

Trap 2 - Standpoint: Designing a control system from the manager's point of view not from the standpoint of those who are subject to control. Judgement can be biased by your standpoint:

- What you feel could motivate your subordinates might not be attractive for them.
- What you feel could stop them from wrongdoing or can make them angry.

Ask the employees for input → initiate conversations.

Trap 3 - Easy performance measurement: Counting on what is easily measurable (quantifiable) rather than what should be measured → Ignoring the soft but important aspects of job.

Trap 4 - Narrow focus: Keep the big picture! The effect of one control is not necessarily independent from that of another control in place → bundle of controls. Example: Research shows that monetary incentives reduce the motivational effect of recognition awards (Lourenco 2016).

Trap 5 - Static approach: People tend to have a static view and fail to see the dynamics that control systems can create. They think that the control system that works well now will always remain effective.

- People find out the loopholes in the system over time → The likelihood of gaming the system increases.
- Changes in the environment or in the organization can influence the effectiveness of a control system.

One Solution: evaluating the control systems in place from time to time (and revising them if necessary).

SESSION 3

MODULE 6: INCENTIVE SYSTEMS

Incentives refer to things that people value:

- **Monetary rewards:** salary, bonuses, retirement benefits, etc.
- **Nonmonetary but tangible rewards:** better office location and furnishings, reserved parking places, awards, country club memberships, resources, etc.
- **Nontangible rewards:** recognition, prestigious job titles, power, names and shames, e.g., China's Haier: displaying good performers with a red smiley face and those who did poorly with a yellow smiley face.

Organizations may use negative rewards (punishments) to discipline behavior:

- **Punishments:** reprimands, demotion, termination, etc.
- In many organizations, punishment is an absence of positive rewards.

Purpose of incentive systems

- How much and how long people put effort into their job (effort intensity, effort duration).
- Which people are selected into the firm (sorting effect)? For example: pay for performance system can attract capable/confident employees.

Design of compensation systems varies across the hierarchical levels

Different types of compensation systems are used for different levels in the organization.

- **Top core managers:** often used: e.g., Equity, EVA and bonus bank. Executives' compensations are impacted by their power → results in excessive pay (see Bebchuk & Fried, 2005)
- **Lower levels:** Flat pay, piece rate pay, tournament pay, bonus pools.

Good incentive system

Rewards should be:

- valued to motivate employees (The taste for rewards may vary across people).
- large enough.
- understandable for employees (the reasons behind offering rewards should be clear)
- timely.
- durable.
- cost efficient.

Economic prediction: the prevalence of Pay-for-Performance

Standard economic theory suggests that incentives should be offered to align the agents' interests with those of the firm. In particular, the focus is on pay for performance (PFP). Relying on the economic theory, we expect to see pay for performance in almost every for-profit organization, but this is not the case in many settings.

Size of variable compensation & risk

Higher pay for performance component in compensation scheme may increase the effectiveness of pay for performance. Yet, it imposes risk on employees particularly if measures are not totally controllable for employees. Therefore, employees ask for a risk premium to compensate for the risk that they bear → offering higher pay to attract talented employees.

Do incentives always work?

Crowding out effect

Monetary incentives can crowd out intrinsic motivation to perform a task. There are many reasons for this effect. → E.g., over-justification effect". People feel that their effort due to the incentive rather than due to their own will. Be careful about incentivizing the tasks that require a lot of creativity with money.

Crowding out effect of pro social behavior

Richard Titmuss (a British social researcher, 1907-1973): **How to motivate blood donation?**

Offering financial incentives for prosocial behavior can reduce prosocial behavior (Ariely et al. 2009). Offering pay for performance for a prosocial behavior may reduce image motivation to engage in that behavior. → Be careful about incentivizing behaviors that are driven by image motivation with money.

Incentives convey information

Incentives may signal information about the task at hand. For example, they may signal that the task is difficult and that is the reason that incentives are given. They may signal information about the norm in a setting (how other agents are doing) or may signal the principal's mistrust to agents. For example, they may signal that most people are lazy or that the principal considers the agents lazy or incompetent and thereby offers incentives.

Incentives can have unintended effects

A typical example in the sales department: Accelerating sales by pushing clients for larger sales, e.g., by offering big promotions or exaggerating the quality of products or services.

MODULE 7: PERFORMANCE MEASUREMENT

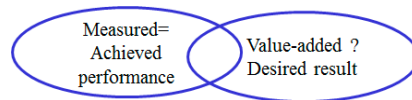
"For effective management, performance definition, i.e., clear and unambiguous articulation of what needs to be done is the priority. Then, measurement is important, and the third thing is rewards." - Steven Kerr, Chief Learning Office, Goldman Sachs

Introduction to performance measurement

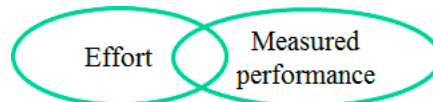
In an agency relationship → The principal cannot perfectly observe the actions of the agent (to make sure that actions are aligned with the principal's interests). Therefore, the principal must rely on performance measure(s). Setting performance measures may look easy at first glance. However, it is one of most challenging tasks of the principal. Performance measures are important because they influence what people pay attention to (effort direction).

What is a good performance measure?

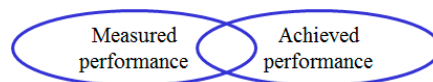
- **Goal Congruent:** Does firm value go up if the measured performance goes up? Is employee pushed towards organizational goals? The measure should be congruent (linked to strategic goals) → Motivating right behavior. Many measures are, however, not fully goal congruent.



- **Controllable:** Is the outcome (measured performance) controllable for the managers? If not, it imposes risk on managers. A good measure should be sensitive and precise (lack of noise).
- **Sensitive:** Does measured performance reflect manager's efforts and actions?



- **Precise:** Is measured performance= actual performance? Free of error.



Different types of uncontrollability

External factors (economic and competitive factors)

- Act of Nature (force majeure) → COVID 19

Internal factors (interdependence firm as a joint production)

- Sequential interdependence: one must complete the task before the other one can do his/her job (assembly line) (one way)
- Reciprocal interdependence: the output of one department is the input of another (two way interdependence)
- Pooled interdependence: loose type of interdependence

Performance measures are incomplete

Performance measures are imperfect representations of the economic consequences of the employee's actions. The measure may not pick up many activities that employees do (e.g., many aspects of the job may not be measurable).

Shortcoming of performance measures: Surrogation

People fail to see a performance measure as an imperfect proxy for the construct of interest and tend to behave as though the measure is the construct of interest. Compensation based on one single performance measure triggers surrogation (Choi et al. 2013).

Measures are subject to manipulation/distortion

Paying attention to the measured aspect of the job and ignoring those aspects of the job that are not measured. This is particularly the case in multi task settings.

Gaming the system → Improving the measured performance without creating value:

- Distributing survey on customer satisfaction only among happy customers when a salesperson is evaluated based on customer satisfaction.
- Lack of acceptance of very ill patient when measuring a hospital's performance by the number of deaths.
- Teaching to the test (when a teacher is evaluated based on students' evaluation score).

Overcoming the shortcomings of performance measures → Finding a perfect measure is difficult if not impossible.

Some solutions:

- Subjective performance evaluation
- Relative performance evaluation
- Multiple performance measures: Including non financial measures → Balanced scorecard (proposing a different approach to performance measurement)

Subjective performance evaluation

Incorporating non measurable aspects: helping others, innovation, improving team spirit. Adjusting for the effects of uncontrollable factor on measured performance. **Three forms:**

- 1) No performance measures (totally based on the supervisor's discretion)
- 2) There is a performance measure → allowing the supervisor to adjust the performance evaluation and bonus (discretionary adjustment)
- 3) There are multiple performance measures → the supervisor can adjust the weight on each in performance evaluation/bonus calculation

Shortcomings of subjective performance evaluation

- Increasing risk on employees and motivating employees to engage in impression management, raising fairness concerns unless the evaluator is fully trusted.
- **Favoritism:** liking/personal relationships may affect performance evaluation
- **Compression bias:** evaluating employees' performance similarly while there is a large performance difference between employees
- **Centrality bias:** rating everyone in the middle of a rating scale.
- **Leniency bias:** giving more favorable rating than the employee deserves.

Relative performance evaluation

Noise reduction: Teasing out the effect of common noise in performance measurement. Peers can be within the same organization or from other organizations. For example, at the executive level, sometimes, the board forms a peer group from the competitors or the comparable companies to evaluate the performance of the CEO.

Shortcomings of relative performance evaluation

- Destructive competition (competition is not always bad!)
- Sabotage, cheating, counterproductive behavior
- Making people more self-oriented and less collaborative

Multiple performance measures

An additional performance measure if it helps in (Feltham & Xie 1994, Lambert, 2001):

- risk reduction: reducing the effect of uncontrollable factors that influence the performance measure
- improving congruity

Costs: losing focus on one measure and spreading attention to multiple ones

Challenge: How to weigh different performance measures? (Objective or subjective)

MODULE 8: BALANCED SCORECARD

Balanced Scorecard: A revolution in performance measurement

BSC was proposed by Kaplan and Norton (1992, 1996) initially as a performance measurement tool or dashboard of performance. It was later developed to be a strategy implementation tool, which helps communicate the strategy to all members of the organization by translating the strategy into a coherent set of performance measures.

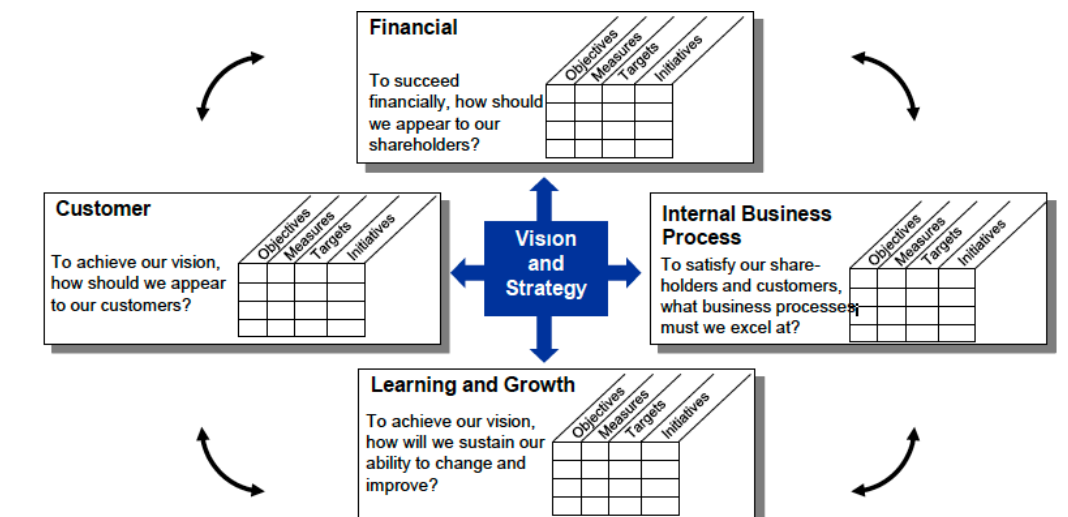
Balanced Scorecard: Addressing the limitations of financial performance measures

- Short termism.
- Financial measures are backward looking. They reflect past.
- Failure to track sources of competitive advantage.
- Dysfunctional behaviors such as gaming.
- Lack of emphasis on intangible assets.
- Lack of an explicit connection between strategy and performance measurement.

Balanced Scorecard: What's new?

- **Balanced performance measurement:** Leading indicators (nonfinancial) as well as lagging indicators (financial)
- **Focus on critical success factors:** Measure and manage intangible assets to be successful in the long term
- **Strategy oriented:** Strategy map: a framework to describe, visualize, and translate strategy into actions

Balanced Scorecard framework



Determining relative weight for each measure

- Economic based prediction: $\text{Weight} = f(\text{precision, sensitive, controllability})$
- Psychology based prediction: $\text{Weight} = \text{Can be influenced by cognitive processing limitations}$

Let's look at some biases!

Common measure bias: Top managers tend to evaluate business unit managers using measures that are "common", the same across business units. UNIQUE measures are often ignored (Lipe & Salterio, 2000). Some solutions to consider the unique measures (Libby, Salterio, Webb, 2004):

- "Thirdparty" reassurance, then unique measures are important
- If evaluators must write explicit reports, then unique measures will be considered.

Outcome bias: Evaluators prefer "outcome measures" over "driver measures" of performance. Driver measures are often leading indicators of performance.

Bias towards general measures: Evaluators prefer "general measures" (such as profit margin) over measures linked to strategy when links are not provided. Solutions: Using strategy maps (Banker et al. 2004).

Bias towards financial measures: Financial measures often get much more weight in evaluations than non-financial ones. Some solutions:

- Make causal linkages visible
- Presentation formats can have an effect !!e.g., use of trend indicators/traffic lights to signal the importance of NON financials

Cautions in using Balanced Score Card

- **VALIDATION IS IMPORTANT (Ittner and Larcker 2003)**
 - Firms not validating links → seem to perform worse, e.g., Large restaurant chain, having several business units in a country
 - Using employee retention in learning & growth → but did it lead to better results? No; supervisor retention was far more crucial than overall employment retention rates
- **Some relations are u shaped: what is the ideal target?**
 - Improvement in customer satisfaction pays off to a certain point (100% satisfied customers = huge costs)
- **Focusing on the wrong measures can be dangerous:** e.g., Number of patents filed by a company in one year: are these patents put to work? Did they earn back their costs?
- Think of BSC as a process, not as an event. The real value of BSC comes from the continuous analysis and communication of strategy.
- BSC is not to define strategy, but to describe and implement strategy.
- BSC is not a benchmarking tool. It is rather a customized tool.
- BSC needs commitment and engagement of managers at different levels of organization, particularly senior managers.
- Avoid too many measures in your BSC (identify only the most critical ones) (See Global oil as an example)
- Consider both costs and benefits of initiatives placed in the balanced scorecard: costs are often overlooked.

SESSION 4
MODULE 9: FINANCIAL PERFORMANCE MEASURES

Why financial measures?

- Financial measures are comprehensive summary of firm performance. They summarize the outcome of many operational initiatives into one or a couple of results measures.
- Financial measures are objective.
- Financial measures are easy and cheap to be used for control. Instead of monitoring all actions and decisions, top management can focus on monitoring one or a couple of financial measures.

Classification of financial performance measures

- **Market measures:** reflect changes in stock price or shareholder returns
- **Accounting measures**
- **Aggregated financial measures:**
 - Ratio terms: return on investment (ROI), return on net assets (ROA), return on equity (ROE)
 - Accounting profit measures: Residual income, economic value added, net income after taxes, earnings before interest, tax, depreciation and amortization (EBITDA)
- **Disaggregated financial measures:** Revenues and expenses

Market measures (merits)

- The closest/direct (but imperfect) measure of firm value (congruent)
- Available (daily)
- Accurate (assuming an efficient information environment)
- Less manipulable than other financial measures (accounting measures)
- Understandable
- Cost efficient (no measurement cost)

Market measures (limitations)

- Market measures are not available for private firms.
- Market measures are not controllable for employees, not even for top managers: the stock price performance is affected by many factors that can be totally independent of employees' and managers' actions and decisions.
- Market measures do not always reflect realized performance; instead, they merely represent expectations
- Market measures may not always perfectly reflect firm value, e. g., because of information asymmetry, market valuations are not always correct, e.g., valuation anomalies (Monday effect/weekend effect).

Accounting measures (merits)

- More controllable for managers compared to market measures
- Can be measured on a timely basis
- Precise and objective
- Understandable
- Cost efficient (little measurement cost)

Accounting measures (limitations)

- Accounting profit measures may fail to reflect firm value perfectly because of conservative accounting rules that require immediate record of expenses (even in case of long-term investments) and slow recognition of revenues. The longer the measurement period, the more congruent accounting measures and firm value.
- Accounting measures ignore values that cannot be measured accurately and easily. Accounting systems are transaction oriented. They only record firm value that is reflected in transactions. For example, it does not record the value of brand or the value of patents that an organization receives.
- Accounting profit depends on the choice of measurement methods (which often requires judgment). For example, depreciation accounting choices: straight line or accelerated methods --> realization of different annual profit
- Accounting measures focus on past. They ignore risks and changes in risks. For example, accounting measures do not consider/reflect if the company made some initiatives to reduce risks.

Return Ratio Measures – ROI, ROE, ROA & ROCE

How were return ratios born? Pierre Samuel DuPont created a small powder factory is « Du Pont de Nemours Corp. » Over time, DuPont became a gigantic dominating company (60% of the market share in 1903). Du Pont established a proper cost accounting system. By 1913, precise data about the profitability of each of the 13 products were regularly reported. Donaldson Brown, Pierre's employee joined the treasurer office and started asking how to increase the return on investment??

DuPont Equation

$$\text{ROE} = \frac{\text{Net Income}}{\text{Shareholder's Equity}}$$

Net income = Income – (costs of goods sold, general expenses, depreciation, amortization, interest, tax, and other expenses)

Shareholder's equity: the owners' investment in the company

$$\text{ROE} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Shareholder's Equity}}$$

Return on Assets (ROA)

$$\text{ROE} = \text{Profit Margin} \times \text{Asset Turnover} \times \text{Financial Leverage}$$

Attention!

- ROA is not useful for comparing companies in different sectors.
- Low ROA is not necessarily bad → The ROA of Banks is typically only 1%
- Very high ROA is not necessarily good → firms are not renewing their assets sufficiently.
- Assets articulated in accounting terms may not reflect economic value (new versus old assets)

Pros and cons of return ratios:

- Return ratios do not have a scale so they are easily comparable.
- It may not be a perfect measure of performance and may promote sub optimal behavior.
 - Underinvestment (opting for leasing instead of purchasing) to reduce the denominator.

Accounting profit measures: Residual income

$$\text{RI} = \text{Net income} - \text{Required Rate of Return (Cost of Capital)} \times [\text{Capital Invested}]$$
$$\text{Capital Invested} = \text{Total Asset} - \text{Current Liabilities}$$

In simple terms, residual income is what remains for the organization after it remunerates, pays, and returns financial resources consumed in its processes.

Accounting profit measures: Economic Value Added (EVA)

EVA is an advanced performance metric tool (value management tool). It is called economic performance. EVA is a refinement of residual income that uses economic measures of income and capital. Adjustments are made on both income (operating profit) and assets employed (invested capital). EVA considers that debt and equity have different costs.

$$\text{EVA} = \text{NOPAT}_{\text{adjusted}} - (\text{Weighted Average Cost of Capital} \times \text{Invested Capital}_{\text{adjusted}})$$

$$\text{Net Operating Profit After Tax: Operating Profit} (1 - \text{Tax Rate}) = \text{Operating Revenue} - \text{Costs of Goods Sold} - \text{Operating Expenses} - \text{Depreciation} - \text{Amortization}$$

WACC (Weighted Average Cost of Capital) - Weighted cost of equity and cost of debt → The average firm's cost of resources each being weighted by category.

Key adjustments in calculating EVA: Adjustments are made to operating income and average operating assets so to capture the effects of decisions on value creation timely and accurately. Although more than 150 possible adjustments

can be made, most firms limit adjustments to 15 or fewer. Amortized vs. expensed (typical ones): R&D, Marketing costs (advertising), Restructuring costs.

Amortization of R&D

Under GAAP, companies are mandated to expense R&D expenditure. However, this may incentivize under investment. Under IFRS, companies can amortize (capitalize) investments as assets on the balance sheet.

Amortization → capitalizing the value of (intangible) asset over time. The value of asset is reduced over time → The benefits of an asset realizes over time → minimizing the under investment incentive.

A pharmaceutical company invests 100,000 EUR in R&D. It wants to capitalize it over 4 years.

	Now	Year 1	Year2	Year3	Year 4
Net asset value	100,000	75,000	50,000	25,000	0
Amortization cost		25,000	25,000	25,000	25,000

MODEL 10: FINANCIAL RESPONSIBILITY CENTERS

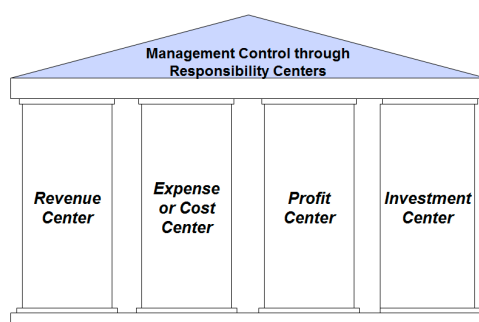
Financial responsibility centers

A responsibility center is an organizational unit/entity responsible for certain output(s) or input(s). If a responsibility center is accountable for financial results, it is called a financial responsibility center.

Financial control through:

- **Assigning responsibility** of certain output(s) or input(s) to a manager in charge of an organizational unit (the responsibility center).
- **Setting targets** (budgets) depending on the type of the responsibility center, measuring actual results, reporting the difference between them, which is called “variance” and managing the variance.

Different types of responsibility centers



Revenue centers

- Revenue Centers are responsibility centers that are responsible for revenue, e.g., sale agencies, sales managers in for profit organizations, or fundraising managers in non profit organizations.
- Revenue centers control revenues but not the manufacturing (costs of goods sold) or acquisition costs of the products or services, nor the level of investment in the responsibility center.
- However, they are often responsible for costs which they directly incur, notably sales costs (commissions, salespeople's salaries, promotion, ...)
- **Decision rights:** It depends. They have authority about some of the sales elements (e.g., sales promotion, staffing salespeople, commissions).
- **Measurement:** Revenue/ Sales unit

Cost centers

- Cost centers are responsible for some elements of costs (financial measure of inputs/resources used by the responsibility center).
- Cost centers control/incur costs but do not directly generate revenues (HR department, IT service)
- **Decision rights:** Cost center managers often choose quantity or/and quality of inputs used in a cost center (labor, material, supplies)
- **Perf. Measures:** total cost for a fixed output/ average production cost/ output for a fixed budget

Minimizing average costs \neq maximize profits.

Reasons:

- 1) Incentive to produce more to spread fixed cost over larger no. units.
- 2) Incentive to reduce quality so to adhere to budget → Quality of products from cost centers should be monitored!

Two types of cost centers:

- **Standard cost centers:** the relation between inputs and outputs is known and both inputs and outputs are easy to measure. e.g., manufacturing dept., food catering at hospital
Evaluation: Comparison of standard costs (how much inputs should be used to generate the output) and actual costs (how much inputs have actually been used to generate the output) = variance analysis
- **Discretionary cost centers:** output is difficult to be measured in monetary terms and the relation between inputs and outputs is unknown or uncertain. e.g., departments at universities, R&D units in organizations
Evaluation is very subjective. It is about whether the center could accomplish the tasks assigned while adhering to budgets. Firms sometimes treat their service centers (e.g., marketing, R&D, or IT dept.) as profit centers rather than cost centers by allowing them to charge other units for the services they provide.

Profit centers

- Profit centers are responsible for some measure of profit (the difference between the revenue generated and the costs of generating this revenue).
- They can influence costs and revenues, but they are not responsible for the investment made to generate profit (they have a fixed capital budget at disposal). Profit center managers often have knowledge about product mix, demand, and pricing. They have often decision rights to choose input mix, product mix, and selling prices (or discounts). E.g., local restaurant manager of MC Donalds's branch.
- **Measurement:** Actual profits (e.g., net operating profits) and actual profits compared to budgeted profits/

Profit centers

Some profit centers act like an independent business. They are also limited forms of profit centers, sometimes called pseudo profit centers:

- 1) Sales focused units that are charged the standard costs of products sold.
- 2) Cost focused units that are assigned revenues based on a simple function of costs. → responsible for gross margin

Why "profit center" structure? This structure pushes managers to think about costs and revenues at the same time and account for the cost revenue trade offs. Some profit centers only sell their products or services to other entities within the same organization. These sales are made at a price (transfer price).

Key challenges in profit centers

- 1) How to set appropriate transfer prices on goods and services transferred within the organization (session 7)?
- 2) How to allocate corporate overhead costs to responsibility centers (session 8 & 9)?
- 3) Profit centers that focus only on their own profits often ignore how their actions affect other responsibility centers, particularly in case of interdependencies.

Some solutions:

- Incentives (rewards, bonus) are paid to profit center managers only if total profit is above a certain level.
- Using non-financial performance measures for evaluation becomes more important when interdependencies exist (see Bouwens & Van Lent 2007).

Investment centers

- Investment centers are responsible for some measure of profit (income statement) and some balance sheet line items (e.g., fixed assets, debt, accounts payable and receivable, inventory).
- In other words, they are responsible for the profit they generate compared to the investment they make (making right investment decisions)

Performance Measures:

- Ratio of profit generated to capital invested to generate that profit (Return on Investment (ROI), return on capital employed (ROCE))
- Residual Income (RI), Economic Value Added (EVA)

Lots of decision rights: Investment center manager has knowledge of investment opportunities and operating decisions, e.g., regional/national manager of McDonalds. They ratify and monitor decisions of cost and profit centers. They decide about the amount of capital invested or disposed and where to invest.

Decision about the type of responsibility center: Revenue center? Cost center? Profit center? Investment center?

- 1) Holding managers accountable for what the firm wants them to pay attention to => depends on firm's strategies and objectives. The decision about the type of responsibility centers and the decision about an organization's structure are related and both are driven by the firm's strategy.
- 2) Managers should be held accountable for things that they can control (controllability principle)
Responsibility and authority should be aligned. Example: a factory manager typically has control over production costs, but not sales. This manager can be accountable for production costs not sales.

Benefits: keeping individuals motivated. If people cannot affect the results, they lose their motivation and stop devoting effort into their job. Violation of the controllability principle could be perceived unfair.

Drawback: No incentives to take actions that can reduce the effects of uncontrollable events, e.g., no incentive to sign up for insurance or hedge risks. Not being responsible for the overhead costs does not motivate managers to reduce them. shift to the influenceability principle

SESSION 5

MODULE 11: INTRODUCTION TO BUDGETS AND BUDGETING

Budgeting is a form of planning. Budgeting systems are an important element of financial results controls. (other elements discussed: financial responsibility centers, performance measurement, incentive systems)

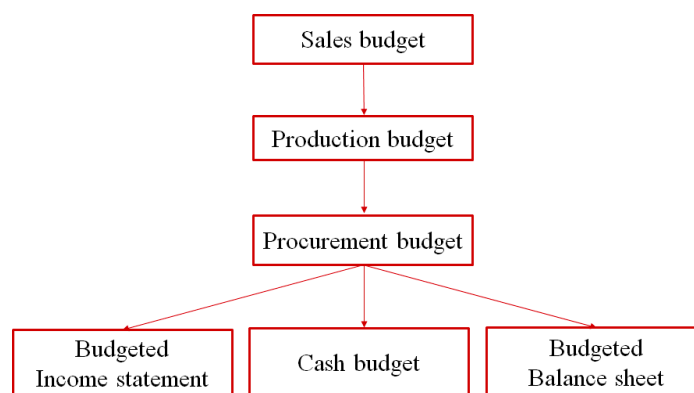
Results control:

- Defining performance
- Performance measurement
- Target setting
- Rewarding performance

Budgeting plays other roles apart from target setting.

A budget → **management's forecast of revenues, expenses, or profits for a future time period.** "Formal quantification of the operation of an organization for a future period." (Zimmerman, p.212). Budgets can be prepared at different business units or departments, across functions. All lower level budgets produced by different functions are aggregated into the master budget.

Master Budget



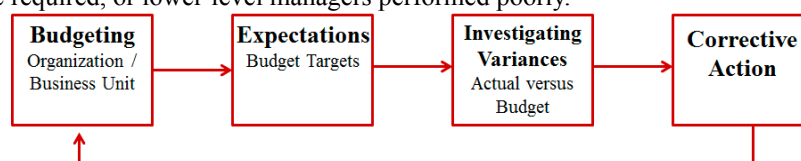
Three planning cycles

- 1) **Strategic Planning:** Long range: Setting a vision, a mission, and objectives & how we achieve the objectives, i.e., strategies.
- 2) **Capital Budgeting (programming):** Middle range: Resource allocation (designing a set of activities to implement the strategies)
- 3) **Operational Budgeting:** Annual: Preparation of a short-term financial plan=budget

Purposes of budgeting

- 1) **Planning:** Promoting forward thinking (feed forward control). People often become occupied with daily activities and fail to have a long-term orientation. Controlling cash flow and identifying financial need.
- 2) **Communication & Coordination - Knowledge Transfers:**
 - a. vertical transfers from lower to higher levels of the organization
 - b. horizontal transfers; marketing to manufacturing → e.g., identify potential bottlenecks in production

Ensure that expectations and assumptions are consistent throughout the firm. Clarifying key planning assumptions: unit placements (orders), prices, purchasing needs and sharing this info across departments.
- 3) **Motivation:** Budgets affect managers' motivation because budgets often act as targets and are linked to performance evaluation and reward systems. Goal setting theory suggests that setting clear, simple, challenging but attainable targets are more motivating than just telling people "Do your best".
- 4) **Contracting - a control tool for top manager:** Divisional managers and top manager often negotiate budgets, reach agreement, and commit to budget agreed. By management by exception, top manager is informed about potential problems and can investigate the corrective actions: whether strategies need to be adjusted, new initiatives are required, or lower-level managers performed poorly.



Budgeting is used widely: About 80% of companies still use budgets (Libby & Lindsay 2010). Budgeting remains the (primary) coordinating mechanism within the firm.

Why is budgeting criticized?

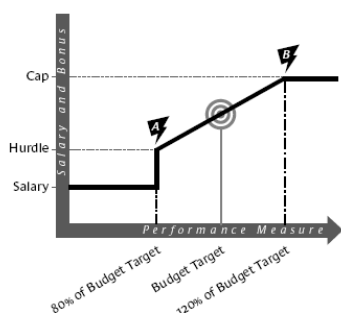
- Time consuming (+/- 20% management time)
- Sticky (only incremental thinking and minor modification to budgets in the preceding periods)
- Assumptions needed may not be valid.
- Lack of flexibility and agility=> hindering adaptability
- Encouraging short-termism: current year / quarter focus
- Encourage gaming, dishonesty, and politicking

Gaming examples:

- Spending money at year end to avoid losing them
- Deferring necessary expenditures
- Accelerating sales near year end to make the budget
- Taking a “big bath”
- Negotiating easier targets

“Traditional budgeting process waste times, distort decisions, and tung host managers into schemers. It doesn’t have to be that way if youre willing to sever the ties between budgets and compensation.” - Jensen (2001, Harvard Business Review): Corporate budgeting is broken - Let’s fix it

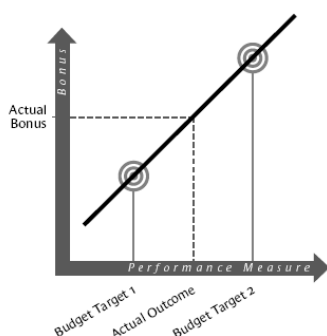
Jensen 2001: traditional compensation system



Kinks create strong incentives to game the system.

- If manager can reach point A or B: increase effort
- If manager cannot reach point A or is nearly passing point B: move earnings from the present to the future.

Jensen 2001: Linear compensation system

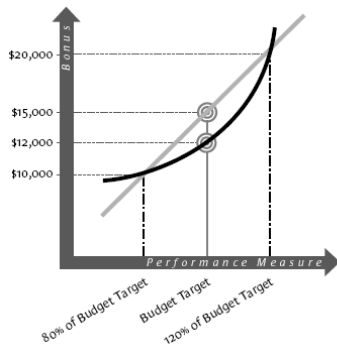


Getting kinks out: Removes incentives to game the system but:

- dishonest managers lie about performance to increase bonus
- often weaker incentive in “relevant range”
- non monetary rewards also have to be independent of budget targets(difficult to implement)

(still need good control systems & attentive executives)

Jensen 2001: Curvilinear compensation system



=> Again, incentives for gaming?
Encourages managers to increase variability

“Stair step” incentive plan at Chrysler and satisficing behavior

For each dealer, Chrysler specified a monthly sales target. Dealers were offered bonuses for fulfilling different percentages of sales target, such as 75 percent, 100 percent, and 125 percent. Chrysler believed that dealers had every incentive to climb these stairs and sell cars, but that is not what happened. Instead, sales dropped, and Chrysler was left with the painful choice of piling up inventory or idle capacity, neither one of which is good for the bottom line. Why did the plan fail?

The company found that when dealers realized they could not reach their monthly goals, their sales efforts plummeted. Dealers waited for the next month a new target rather than push cars in a month for which the quota and bonus were out of reach.

Cars Sold (#)	Target Fulfillment (%)	Per Unit Bonus (\$/car sold)	Total Dealer Bonus (\$)
50	50	0	0
75	75	100	7,500
100	100	250	25,000
125	125	300	37,500

Should budgeting be abandoned?

- Budgeting is inherently problematic and thus should be abandoned (beyond budgeting, Hope & Fraser 2003). E.g., Svenska Handelsbanken (Swedish based) eliminated budgets in 1972: no annual budgeting processes. Beyond budgeting: Simple structure, emphasis on lateral communication (sharing best practices), no fixed targets for negotiation, resource allocation based on events.
- Budgeting is not dysfunctional per se, but the problem lies on the design & use of budgeting. There are lots of trade offs in design and use of budgeting system. No single and quick solution. Budgeting system should be customized to the context.

MODULE 12: CHARACTERISTICS OF BUDGETING SYSTEMS

What is a good target?

Learning from psychology of goal setting → **SMART Goals:**

- Understandable and recognition (**S**pecific)
- Should be easy to measure (**M**easurable)
- Should be achievable with appropriate effort (**A**ttainable)
- Realistic but some challenge (**R**ealistic)
- Should motivate on the appropriate timeframe (**T**imely)

How difficult should a target be? Targets should be challenging, but attainable by some effort.

Target flexibility: Should targets be revised during the accounting period?

Flexible targets: People may not take targets very seriously or spend time to convince their superior to adjust targets. However, targets may lose its motivational power in case of uncontrollable events.

Fixed targets: Satisficing behavior = Just hit the budget

- Move sales to this period, if you are close to target

- Move sales to next period if target achieved or missed

Narrow focus: miss out on long term opportunities → Fairness issue

Using budgets for performance evaluation and rewards

Budgets are often used for both decision management and decision control. Optimal decision making requires managers to fully reveal private knowledge about production and market conditions during budget negotiations. However, when budgets are used for performance evaluation, managers make biased budget forecasts so that their actuals will look good relative to budgets e.g., negotiating easier targets (budgetary slack).

- What sales target are salespeople going to set if rewarded based on sales?
- What is more important in the context? Control (motivational effects) or information (decision making, e.g., planning)??

Who should set the target? Top down budgeting versus bottom up budgeting

Top down budgeting (e.g. Potter Bowen):

- Knowledge: Top management makes forecasts
- Decision rights: begin with aggregated forecasts for the firm and disaggregate down to the lower levels.

→ Providing more control but being less informative for decision making

Bottom-up budgeting (participative budgeting) e.g., Madden international:

- Knowledge: Lower levels have more specific knowledge than top manager
- Decision rights: Managers are held responsible for meeting the target they propose.

Managers are more committed when they set their initial performance targets. However, managers may set easier targets than they can achieve or ask for more resources (create budget slack) → Providing less control but being more informative for decision making.

Budget types/characteristics

Line item budgeting: Line item budgets authorize managers to spend only up to the specified amount on each line item.

Advantages = tight control:

- Reduces chance of managers taking actions inconsistent with firm goals.
- Reduces agency costs of opportunism; need to be spent on specific items (limiting use of resources in a self interested way)

Disadvantages:

- Inflexible in responding to unanticipated needs
- Little incentive for cost savings

Rolling budgeting: Continuous updating of budgeting. Future period is added as the current period concludes. Forecast period: 5 to 6 quarters ahead.

Advantage:

- More accurate and realistic budgets.
- More flexibility in case of unexpected events.
- More adaptive to changing market circumstances.

Disadvantage:

- Time consuming
- It might lead to frequent relocation of resources.

Budget lapsing: The requirement that funds allocated for a particular year cannot be carried over to the following year.

Advantages:

- Tighter control than budgets that do not lapse
- Prevents risk averse managers from accumulating funds

Disadvantages:

- Encourages wasteful spending near end of fiscal year, e.g., in governments: Consuming the budget to avoid getting less next year (ratcheting for costs). If we prove we can do with less, there is no need for management to give us the same next year.

Flexible budgets vs. Static budgets

- Static budgets do NOT vary with volume. It is prepared for one level of activity (sales volume). BUT volume is not always controllable by manager.
- Flexible budgets are stated as a function of some volume measure and are adjusted for change in volume.

Zero based budgeting vs. Incremental budgeting

Incremental budgeting: Begin with current year's core budget and make incremental changes

- The review focuses on incremental changes and may ignore inefficiencies in core budget

Zero based budgeting (ZBB): Each year we start from scratch! We start with a clean sheet!

- Mandates each line item in budget to be justified every period
- Motivates managers to eliminate inefficient expenses
- Useful when a firm is changing strategic direction or is under high uncertainty
- Time consuming
- Ratcheting becomes difficult (actuals do not serve as input)

One challenge in target setting: Target ratcheting ($\text{Budget } t = \text{actual } t1 + \text{adjustment}$)

Ratchet effect refers to the tendency to set the next year target based on the past performance. Performance targets are usually adjusted upward more significantly if the past performance is good than bad → Employees reduce their current output.

Reducing target ratcheting: eliminate budget targets, zero-based budgeting, job rotation, and relative targets.

SESSION 6

MODULE 1: TERMINOLOGY OF COSTING

A **cost** is resources given up to achieve a specific objective. Usually measured as a monetary amount that must be paid to acquire goods and services.

A **cost object** is anything for which a measurement of its costs is desired. It can be a brand, a product line, a client, a project, an activity, a product, a service, a unit, etc.

A **cost driver** is a factor that causes a change in the cost of the cost object. E.g., the number of employees is a cost driver of HR services. The number of computers used is a cost driver of IT services.

An **opportunity cost**: benefits given up by choosing one course of action.

Opportunity costs

What is the opportunity cost of attending this session?

What is the opportunity cost of obtaining a Master's degree at KU Leuven?

Examples of opportunity costs in business:

- Inventory holding or just in time? Lowers cost of capital versus foregone interest on holding inventory
- Is the use of excess capacity free? Not necessarily, it can sometimes increase cost (congestion near capacity)
- Product cannibalization = Launch of a new product may affect sales on old products (forgone opportunity)

Economic costs versus accounting costs

- Be careful in using accounting costs in decision making. Accounting costs are not opportunity costs.
- Accounting costs are historical costs. Costs are recorded after the decisions have been made.
- Economic costs consists of accounting costs (explicit costs, recorded in a bookkeeper's ledger) and opportunity costs (implicit costs).
- Nevertheless, accounting costs can be helpful for controlling purposes: evaluating and monitoring managers' performance based on their past decisions (e.g., variance analyses).

Sunk cost dilemma - Sunk cost fallacy → I have already spent so much money & time on this project. Isn't it crazy to stop it now?

A sunk cost: a cost that has already been incurred and cannot be recovered.

Should we continue or stop a project when time/money/ any other resource has already been spent on it, but the desired results have not been achieved??? Avoid considering sunk costs in decision making because they are already incurred and would not change irrespective of whichever choice you make.

Relevant versus irrelevant costs

Which costs are relevant for decision making? Relevant costs are defined based on the type of the decision.

Costs that vary across alternative courses of action are relevant: opportunity costs or incremental costs. Past costs are often irrelevant: sunk costs, committed costs, past variable costs. Sunk costs are expenditures incurred in the past that cannot be recovered.

- When facing different scenarios, don't consider the total costs, but only the relevant costs and revenues that are impacted by your decision.
- Costs should not be analyzed without considering revenues.
- Historical costs / past costs are only used to help forecasting future costs

Cost behavior (cost variation, cost structure): how a cost changes with a change in the product/service volume or activity level.

Fixed costs: costs that we incur even when there is no production. E.g., rents, insurance.

Variable costs: costs that change as the quantity of product or service changes. (variable cost per unit * units produced)
E.g., raw materials

Total costs: Fixed costs + Variable costs

Are all costs fixed or variable? Not necessarily

Sometimes = STEP WISE!

e.g., increasing the capacity

Sometimes = Mixed (semivariable)!

Are fixed costs always fixed? Are variable costs always variable? Not necessarily

The variable/fixed distinction depends on the time horizon.

Fix costs are often variable in the long run.

Sometimes, variable costs can become fixed costs e.g., by changing the type of supplier contract.

Cost are seldom linear in reality

Learning curve: cheaper over time; cost may decline with more volume

Near capacity: overtime; breakdowns; cost may increase again

Relevant range: is the range of volume or activity within which a company expects to operate.

In the relevant range, we often assume that cost behavior is linear. Because:

- Simple for decision making
- Practical = Fixed vs. Variable cost distinction
- Cost volume profit = Break even

Marginal cost and average cost

- Marginal cost = cost of producing 1 additional unit (slope of the tangent line) $MC = dTC/dQ$
- Average cost per unit = Total cost / Quantity

Is marginal cost equal to variable cost? Yes, only in the relevant range assuming linearity. Where marginal cost per unit does not vary with volume.

Direct costs versus Indirect costs (overhead costs)

- Direct costs: those costs that are easily traced to the products or services. e.g., direct material costs and direct labor costs.
- Indirect costs (overhead): those costs that cannot be directly traced to the products or services. e.g., administrative costs, insurance, depreciation.

Can direct costs be fixed?

Insurance costs or rents of a production plant. → direct but fixed

Can indirect costs be variable? Energy costs (e.g., electricity) for other departments except the production unit.

Product costs versus period costs

Product costs (units manufacturing costs): all the costs incurred to manufacture a product. e.g., costs of materials or labor.

Period costs: all non-manufacturing costs incurred to sell a product. e.g., administration, advertising, or distribution.

Only product costs are included in the estimating the cost of inventory

MODULE 2: COST VOLUME PROFIT ANALYSIS (CVP)

CVP: a tool to analyze how total revenues, costs, or profit change with changes in the selling price, or the volume of products/services (Q).

$$\text{Profit} = \text{Revenue} - \text{Total costs}$$

$$\text{Profit} = \text{Revenue} - \text{Variable costs} - \text{Fixed costs}$$

$$\text{Profit} = Q (\text{selling price} - \text{variable cost per unit}) - \text{Fixed costs}$$

contribution margin

$$\text{When Profit} = 0 \rightarrow \text{Breakeven Point} = \text{Fixed Costs} / \text{Contribution Margin}$$

Operating Leverage = Fixed Costs/Total Costs

- Firms with a high operating leverage have:
- Rapid increases in profits if sales expand
- Rapid increases in losses when sales fall
- Longer to break even !!
- In price competitions, they can survive more price reductions.

Degree of operating leverage (DOL) = % change in EBIT / % change in Sales

Analyzing the impact of any change in sales on the company's earnings.

MODULE 3: INTRODUCTION TO COST ALLOCATION

Consider the apartment you shared with someone who was not related to you, how would you pay for the following?
Internet, food, gas, rent, electricity, phone, etc.

You have a house. You have rented it to three families. Imagine that the heating system and electricity are centralized. You recruited one person to clean the corridors, common areas and garden. You have also made a contract with a company to do maintenance.

- How would you allocate these costs to your renters?
- What costs would you allocate to the renters? What if you don't charge the renters for the maintenance costs?
- What if you charge them a fixed monthly amount?
- Could the way you allocate costs change the total costs?
- Do you think the way you allocate the costs would impact your renters' behavior?

Cost allocation = assignment of indirect (common or joint) costs to a cost object

Purpose: often to arrive at a full cost of a 'cost object'.

- Allocation of costs to operating units/departments/projects
- Allocation of costs to products/services: Cost of treating a patient, product costs

Reasons to allocate costs

EXTERNAL REASONS

- Inventory valuation and cost of goods sold for financial reporting
- Segmental reporting : Costing to different regions, products, factories
- Taxation
- Cost based reimbursement (hospitals, universities)

Some government contracts and regulated industries use cost plus contracts

INTERNAL REASONS

- Decision making (e.g., product pricing)
- Control

Central executives can control behavior of operating managers with cost allocation - allocating costs of a service to a center demotivates its excessive use

Steps to allocate costs

- Define the cost object(s). Decide what departments, products, or processes to cost.
- Accumulate the common/indirect costs to be assigned to the cost object(s). E.g., shared IT resources order administration, HR, R&D.
- Allocate the accumulated costs to cost object(s) using an allocation base.

Allocation Base

- An allocation base relates the common cost and cost object. It measures how much of the common cost is consumed by the cost object. Changes in an allocation base should reflect changes in the actual cost.
- An allocation base takes a form of quantity or measure. Examples: Machine hour used: allocating maintenance and repairing costs to units. Number of employees working in each unit: allocating HR department costs to units.
- Finding a good allocation base is difficult. Sometimes, it is determined upon a mutual agreement.
- An allocation base should ideally be a driver of costs incurred by the cost object. => all cost drivers are allocation bases, but all allocation bases are not cost drivers.

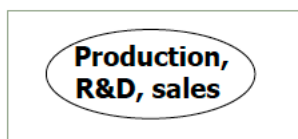
Cost allocation as a tax system

Allocation of costs of using a resource is economically equivalent to taxes on that resource = internal taxation. Cost allocation can be used to approximate hard to observe externalities (i.e., costs that people cause on others without direct participation or receiving any compensation). E.g., hiring a person puts extra burden on IT or HR and operating room in hospital puts demand on cleaning.

Decentralization

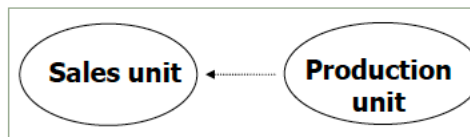
Centralization

- ✓ More control & coordination
- But it also has costs:
- ✓ Unmotivated / low effort
- ✓ Information travels slowly
- ✓ Slow decision making



Decentralization

- ✓ People are more intrinsically motivated (commitment)
- ✓ Quick decision making
- ✓ Better understanding of local needs.
- But it has costs:
- ✓ Goal incongruence/imperfect coordination
- ✓ Divisions optimize at sub-unit level = not always optimal for the firm as a whole.



What is transfer pricing?

Transfer price: The internal price charged by one unit of a firm for a product or service supplied by another unit of the same corporation. The price at which products or services are transferred between responsibility centers (at least one party is a profit center/investment center) within the same corporation.

Examples of transfer pricing:

- Product transferred between two business units (one unit's output is an input for another unit).
- Internal charge paid by final assembly division for components produced by other divisions.
- Service fees paid to telecommunications, or HR departments to support the operating departments.

Why not transfer for free?

MNC produces and sells product A in a market. The firm is centralized, and top management makes all decisions. Revenue and cost functions are given:

$$R(Q) = Q (100 - 2Q)$$

$$C(Q) = Q^2 / 2$$

At which Q is FIRM PROFIT MAXIMIZED? $\text{MAX } (100Q - 2Q^2) - Q^2 / 2$

Solution: First derivative set to zero

$$100 - 4Q - Q = 0$$

$$5Q = 100$$

$$Q = 20$$

TRANSFER PRICING = Aligning interests

Both units can be evaluated as profit centers (self-regulated). Units become aware of costs (production is not free)!

Why transfer pricing?

- Alignment of interests of units with the firm's interests.
- Provides relevant information for managers to make right trade-offs between costs and revenues.
- Measuring performance of responsibility centers
- International taxation

Transfer pricing and tax avoidance

- Sub-units of a multinational firm operate in different tax regimes
- Transfer prices can be set strategically to avoid paying high taxes

Reduce Taxable Income: Segment in higher tax country and charge high price on imports and low price on exports

Increase Taxable Income: Segment in lower tax country and charge low price on imports and high price on exports

MODULE 5: METHODS OF TRANSFER PRICING

“The choice of transfer pricing method does not merely reallocate total company profits among business units; it also affects the firm’s total profits.” – Zimmerman

What is a good transfer price?

- Optimal transfer price for a product or a service: its opportunity cost Opportunity cost: “value forgone by not using it in an alternative way”
- But opportunity cost is often hard/expensive to estimate and to use in practice.
 - Information asymmetry between the headquarter and operating managers
 - Lack of information

→ Alternative Transfer pricing methods

Other considerations:

- Impacts on managers’ motivation (control)
- Fairness
- Simple to understand and implement.

Transfer pricing methods

- Market-based transfer pricing
- Cost-based transfer pricing
 - Variable cost transfer pricing
 - Full cost transfer pricing
 - Full cost/ variable cost + a mark-up
- Negotiated transfer pricing
- Dual-rate transfer pricing

Market-based transfer pricing: Market price is a good approximate of opportunity costs because the market price is the amount of cash that the company forgoes (given up) by selling inside.

Deviations can be allowed to reflect differences between internal and external sales:

- Savings in marketing, selling, packaging, and collecting costs;
- Differences in quality standards, special features, or special services provided.
- Considering interdependencies between units

However, similar goods do not always exist in the market => using market-based transfer pricing difficult => cost-based transfer pricing

Variable-cost transfer pricing: If external market is not available, variable cost can be an effective transfer price particularly in case of excess capacity. Variable cost transfer pricing is not so common.

Some problems:

- Fixed costs are not recovered. It provides poor information for evaluation purposes because
 - The selling entity appears to make loss.
 - The profits of the buying entity are overstated.
- It can be problematic if some variable costs change with volume (e.g., overtime)
- Separating variable and fixed costs.
 - Create disputes over measuring variable costs (e.g., reaching capacity).
 - Create incentives to distort variable costs upward by classifying fixed costs as variable costs (e.g., electricity bills) (E.g., XBT keyboards)

Full-cost transfer pricing: Full-cost transfer pricing is very common. However, some problems (decision making):

- The seller does not make profits. => does not create motivation for the seller.
- In case of excessive capacity => Full-cost is more than the real opportunity cost!
- Sometimes, the full-cost is above the market price and thus the buyer is not motivated to buy inside.
- Production inefficiencies are transferred to buyers.
 - Not so responsive to market changes (technological advancement)
 - No incentive to improve efficiency because inefficiencies are shifted to buyers.

**Allowing the buyer to purchase externally would be helpful.

Full-cost/variable-cost plus mark-up transfer pricing

Variation of full-cost/ Variable-cost transfer pricing:

- Variable cost and a fixed “fee” → covers at least part of fixed costs
- Full cost and a fixed “fee” → allows the selling units to earn a profit on internally transferred products/services.

However, it has similar issues. e.g., it does not create much incentive to adapt to market changes.

Negotiated transfer pricing: In many situations, the most efficient among all alternatives. Approximates opportunity cost because a seller does not agree a price below its opportunity cost and a buyer does not pay above the product’s price elsewhere.

Some problems:

- Sensitive to bargaining power
- Conflicts arise particularly in case of power inequality
- Central intervention when no agreement
- Time consuming

Dual-rate transfer pricing

- Resolving internal conflicts:
 - The selling unit is credited with the outside sales price; the buying unit is charged the variable cost only.
 - The difference is charged to the corporate account and eliminated at the time of financial statement consolidation.
 - Allows for the fair evaluation of managers’ performance but it is time consuming and complex.
- Sometimes, firms use multiple transfer prices to avoid tax, but also to avoid encouraging wrong decision-makings.

MODULE 6: A KEY CHALLENGE IN TRANSFER PRICING

Death Spiral: Elimination of products/services due to spreading costs based on volume instead of their root causes of costs. Using full cost transfer pricing & allowing the users to buy from the market may cause death spiral. Reduction in the product/service demand => spreading costs to the smaller number => average cost per unit increases => demand decreases.

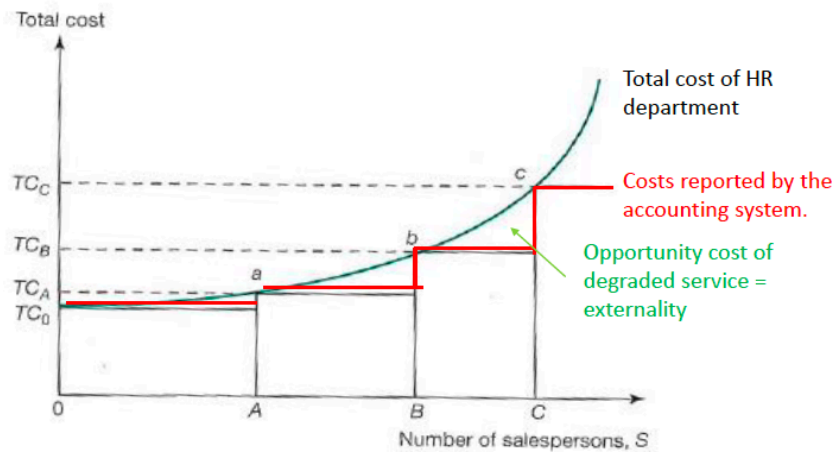
SESSION 8:
MODULE 7: COST ALLOCATION METHODS

Why allocating service department costs to operating costs?

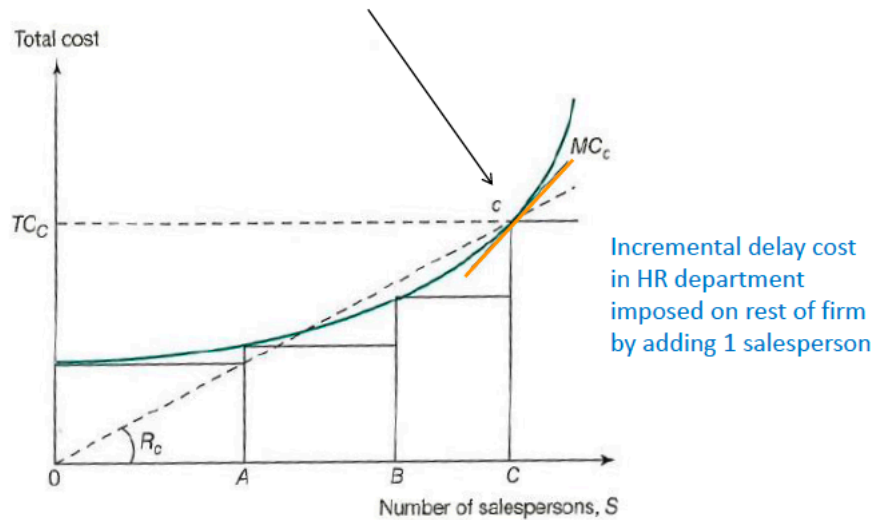
- Encourages reduction of use of costly services & Reveals economic demand for services
Cost allocation can be used to approximate hard to observe externalities (i.e., things that people cause on others without direct participation or receiving any compensation), e.g., hiring a person puts extra burden on IT or HR. Rational users will pay a transfer price (incur allocated cost) only when the benefits of getting a service are greater than or equal to that price.
- Compare internal service departments to external vendors
Gross inefficiency is revealed when internal transfer prices greatly exceed external prices.

Total cost of HR department

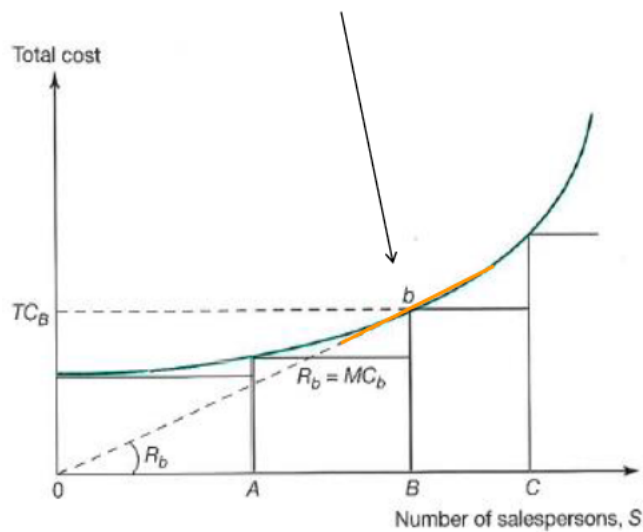
=> Step function that depends on # salespersons



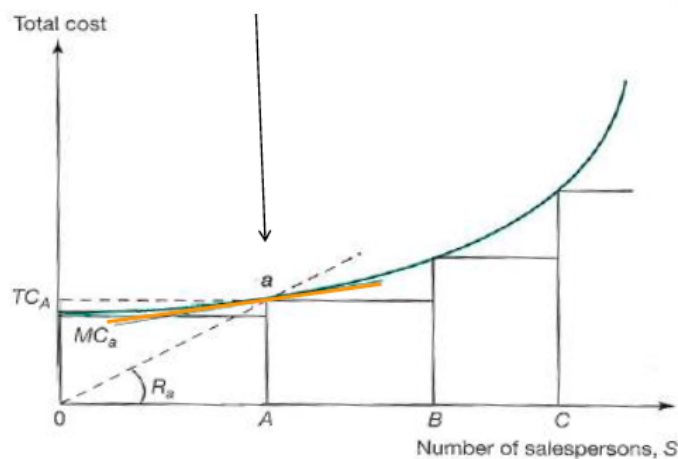
Case 1: Average HR cost per employee < MC => allocate HR costs (overhead costs)



Case 2: Average HR cost per employee = MC => allocate HR costs



Case 3: Average HR cost per employee > MC => cost allocation may do more harm than good: managers might decide to hire too few salespeople



When should service department costs be allocated to the operating departments?

It depends! => Benefits versus costs

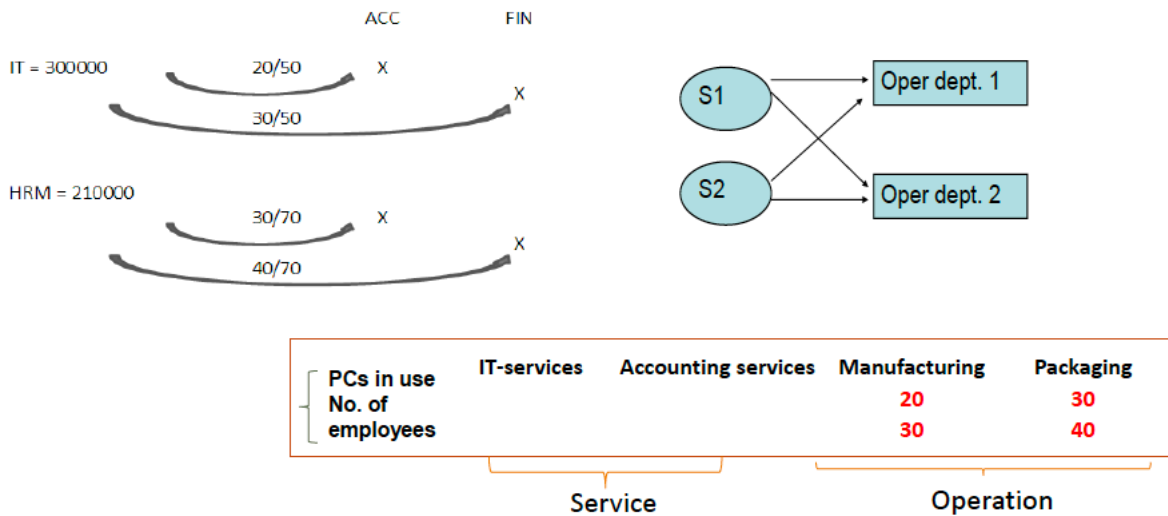
Is average cost increasing or decreasing?

Where are we on the curve and how the curve looks like?

- CASE 1: Average cost < MC (Marginal cost) => Average cost is increasing
- CASE 2: Average cost = MC => Average cost is at a minimum
- CASE 3: Average cost > MC => Average cost is decreasing

Methods to allocate service department costs to operating units: Direct, Step-down, Reciprocal.

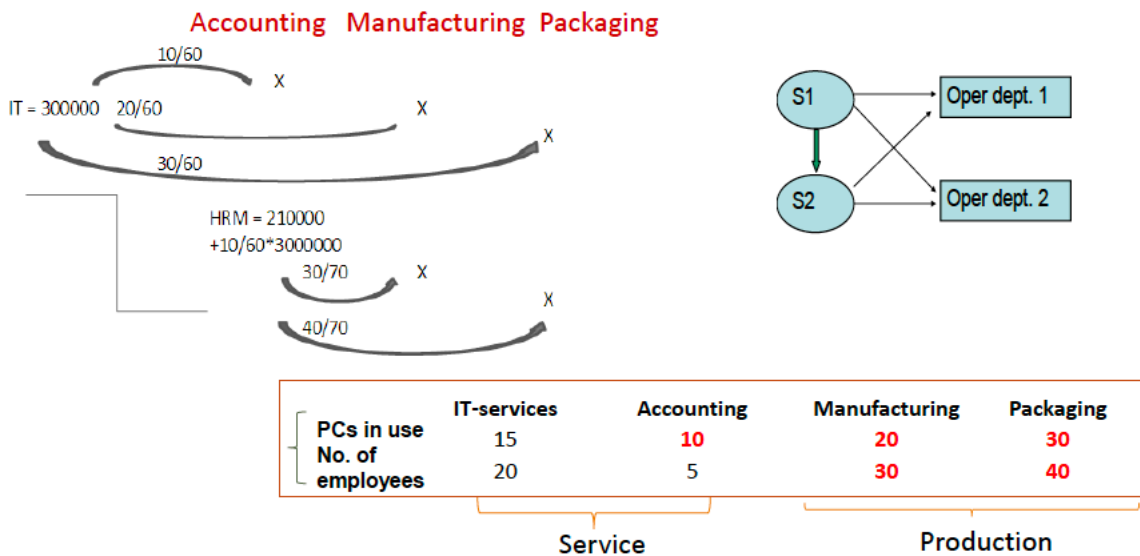
Direct:



BENEFITS: Quick, simple: commonly used

DOWNSIDE: True relationship? Ignores the fact that service departments serve each other. e.g., accounting serves IT/ IT supports accounting infrastructure

Step-down allocation:



Reciprocal:

Recognizes mutual support services.

IT delivers support to Accounting & Accounting delivers to IT

Simultaneous equations problem solving:

Once this solution is obtained -> allocation to operating dept.

Why often not used?

- Not intuitive and complex
- Often small differences, especially when a good step down is used

MODULE 8: NON INSULATING VERSUS INSULATING COST ALLOCATION

Insulating cost allocation: The allocation base is not related to unit's performance.

Noninsulating cost allocation: the cost allocated to one division depends on the operating performance of other divisions

Both allocation methods motivate managers to reduce waste of common resources, but they differ in other incentives.

Insulating cost allocation: e.g., floor space

- Each division bears its own risk of events outside its control.
- One's performance is not distorted by the performance of others.
- Performance of a division does not influence the rewards of the others.

Noninsulating cost allocation: e.g., profitability

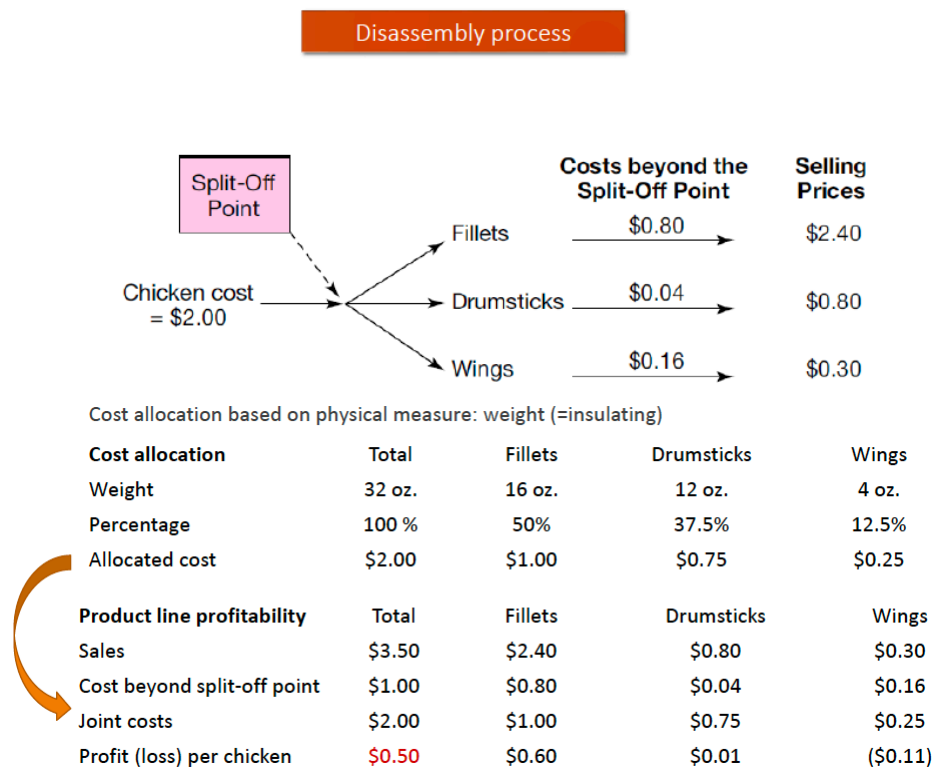
- Costs allocated to one division depend on the performance of other divisions.
- Creates incentives for mutual monitoring and cooperation because one's rewards depend on the performance of other divisions.
- Sharing risks: Reduce risks on managers for the events that are outside their control. If random events are uncorrelated across the divisions, then when one division is doing poorly, the others are probably doing better and bear more of the costs.
- Reducing the variability of the divisions' performance.

Depends on the interdependencies and synergies between divisions. In case of high interdependencies and importance of fostering cooperative behavior → noninsulating cost allocations

MODULE 9: JOINT COST ALLOCATION

Joint cost allocation is a special case of cost allocation. A **joint cost** is incurred to produce two or more products from the same input. In chemical industries: main product(s) & byproducts (low sales value compared to the sales value of main product(s)). Example: processing crude oil and producing gasoline, kerosene, gases, naphta, etc.

How to allocate joint costs to joint products?



A loss is incurred from further processing the wings. Assume that management decides to stop selling wings. → What happens?

Cost allocation		Total	Fillets	Drumsticks
Weight		28 oz.	16 oz.	12 oz.
Percentage		100 %	57.14%	42.86%
Allocated cost		\$2.00	\$1.14	\$0.86
Product line profitability		Total	Fillets	Drumsticks
Sales		\$3.20	\$2.40	\$0.80
Cost beyond split-off point		\$ 0.84	\$0.80	\$0.04
Joint costs		\$2.00	\$1.14	\$0.86
Profit (loss) per chicken		\$0.36	\$0.46	(\$0.10)

Stop selling drumsticks?
Joint cost allocation can cause death spiral!

The joint cost of the chicken is SUNK at the time of the decision to process it further.

What is important to consider in assessing the profitability of products is the difference between selling price and costs that would be incurred beyond the split-off point.

Selling price – beyond the split-off costs = Net realizable value (NRV)

Joint product with positive NRV: do further process

Joint product with negative NRV: do not further process

NRV is the best to decide about eliminating or producing a product in joint production because other methods distort incremental profitability of the product.

	Total	Fillets	Drumsticks	Wings
Sales	\$3.50	\$2.40	\$0.80	\$0.30
Cost beyond split-off point	\$1.00	\$0.80	\$0.04	\$0.16
NRV	\$2.50	\$1.60	\$0.76	\$0.14
Joint costs (allocated based on NRV)	\$2.00	\$1.28	\$0.61	\$0.11
Profit (loss) per chicken	\$0.50	\$0.32	\$0.15	\$0.03

Fillets have 64% of the total NRV's of the three joint products =>

Allocate 64% (1.60/2.50) of the joint costs (64% x \$2 = \$1.28) to fillets

Drumsticks: 0.76/2.50 = 30%

Wings: 0.14 / 2.50 = 6%

Is NRV always useful?

Net realizable value depends on the sales price.

- Not very useful for planning purposes because sales price is often more volatile than production costs.
- Not useful for pricing decisions, since it depends on the price.
- Sometimes, it incentivizes overly large price reductions: Watch out if managers have pricing responsibility.

SESSION 9

MODULE 10: INTRODUCTION TO ABSORPTION COSTING (FULL COSTING)

Absorption costing: allocating all manufacturing costs to products. Manufacturing costs are the costs of materials and the costs to convert the materials into products

- Direct labor and direct materials (direct costs) can be easily traced to products.
- Manufacturing overhead (fixed and variable) should be allocated to products.

Absorption costing is very common → 70% of UK firms (Al-Omiri & Drury 2007)

Why absorption costing?

Financial Reporting:

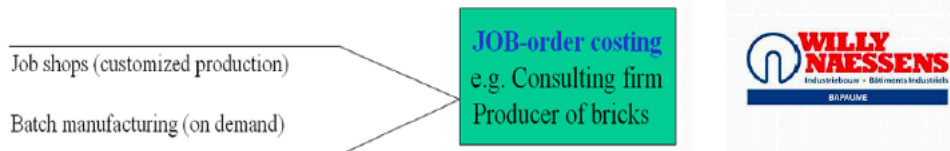
- Book value of inventory → Balance sheet
- Cost of goods manufactured → P&L account
- Segment reporting; cost allocated to BMW automotive, motorcycle, leasing

Decision making:

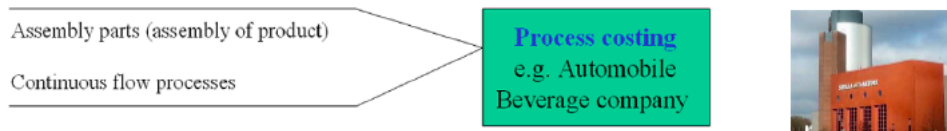
- Pricing
- Transfer pricing
- Product mix decisions
- Cost reduction → Activity based management

Two types of production require different costing

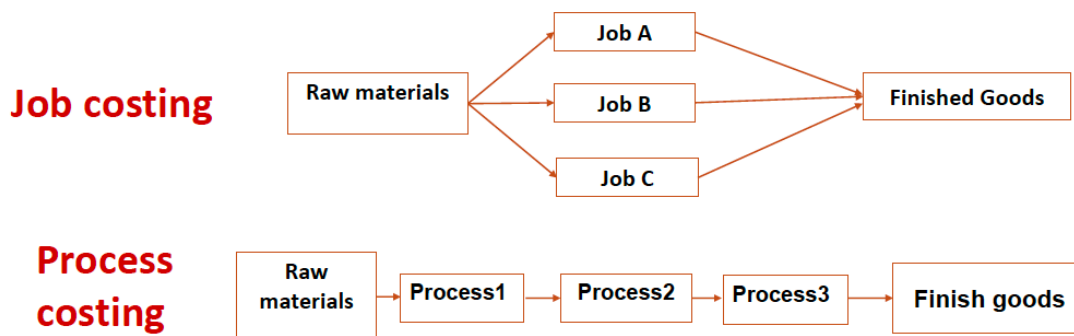
Heterogeneous products/ batches/jobs often to meet clients' demands.



A mass quantity of a product or a service (homogenous/identical products)

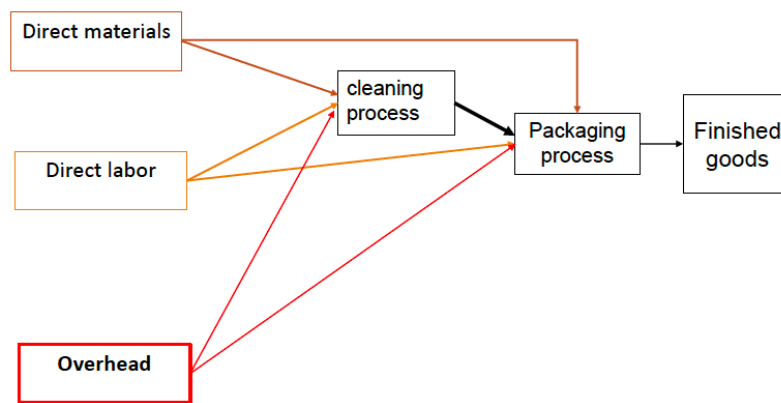


The type of costing should fit the type of manufacturing



Mass production: Process costing

Costs are allocated to the production processes. The output of each process is the input of the other process. Each unit is assumed to receive the same amount of direct material costs, direct manufacturing labor costs, and overhead manufacturing costs. The unit cost of a product or service is obtained by assigning total costs to the number of units. Examples: beverage company, chemical company



Job shops /batch production: Job costing

Products are produced in jobs or batches=> heterogenous products

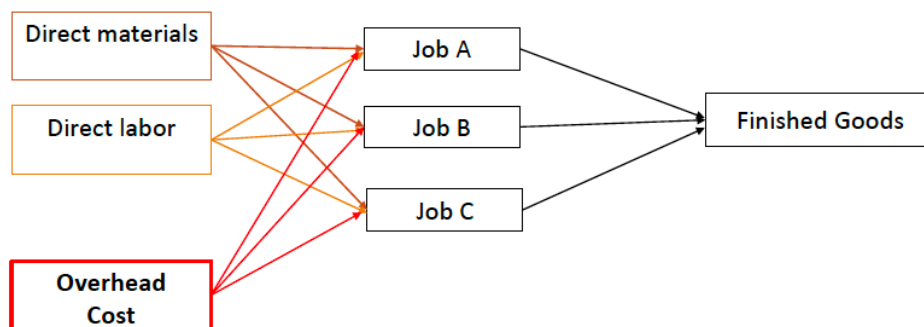
Examples: constructing aircrafts-ships-buildings. Law firms, consulting firms

Each job is unique.

=> it is done in a specific manner to meet the client's needs (products or services are often produced based on orders).

=> each job requires different raw materials and direct labor + maybe different common resources

Costs are tracked to jobs and then a product cost is calculated by dividing the job/batch cost by the number of products in that specific job/batch.



MODULE 11: JOB COSTING

Setting a good allocation base

- **Accuracy:** Choose one that has a high association with overhead: what are the drivers of overhead cost?
- **Simple:** Most of the time, input drivers are used, e.g., labor hours: jobs that use more labor hours should cost more. Other volume drivers are machine hours, raw materials used "output drivers": total units produced (often heterogeneous).
- **Behavioral effect:** think of behavioral consequences
- **Cost allocation** = internally taxing the use of resources (affecting the behavior of people, i.e., the number of salespeople in sales department to allocate HR costs.)

What is a scarce & constraining resource?

Setting an overhead rate

$$\text{Overhead rate} = \frac{\text{annual overhead costs}}{\text{volume of allocation base}}$$

=> Problem: actual overhead costs and volume of allocation base are available ONLY after the production process is complete. => a time lag

=> We want to allocate costs to jobs as soon as they are produced. => **budgeted (prospective) overhead rate**

$$\text{Overhead rate} \xrightarrow{\text{(Budgeted)}} \frac{\text{Budgeted annual overhead costs}}{\text{Budgeted volume of allocation base}}$$

Budgeted overhead costs (nominator)

We can use flexible budgets:

budgeted OH = Fixed + Variable part

budgeted OH = FOH + VOH_{rate} x budgeted volume

Example: FOH= \$500,000, VOH= \$20 per machine hour

Allocation base= machine hours

Expected machine hours= 100,000

Budgeted annual overhead= 500,000+ (20*100,000)=\$2,500,000

Budgeted overhead rate= $\frac{\$2,500,000}{100,000 \text{ machine hours}}$ = \$ 25 per machine

Budgeted volume (denominator)

1) **Expected volume:** volume expected for the coming year: E.g., volume upcoming year: 95,000 Machine hours.

2) **Normal volume:** long-run average volume: E.g., operational lifetime: 320,000 hours over 4years=> 80,000 per year

Job order cost allocation

Trace all direct costs (direct materials and labor) to jobs (WIP)

Allocate overhead cost to jobs (WIP) via budgeted overhead rate

- Estimate the total budgeted overhead costs
- Estimate the budgeted volume over a period

=> estimate budgeted overhead rate

- Allocate OH to products/jobs as soon as jobs are done !!
- Overhead (OH) is accumulated during the year in T-accounts

What about if actual overhead differs from allocated overhead costs??

Under-or over-absorbed overhead

- **Actual overhead** incurred for a year is the amount of indirect manufacturing costs incurred during the year.
- **Absorbed overhead** (also known as applied overhead) is the amount of overhead applied to work-in-process during the year using the prospective (predetermined) overhead rate and the actual number of inputs (e.g., the number of machine hour) used.

Under-absorbed overhead exists when actual overhead > absorbed overhead

Over-absorbed overhead exists when actual overhead < absorbed overhead

Three ways to treat under-or over-absorbed overhead

1. Write-off: to the cost of goods sold account (CGS)

=> product cost does not change

2. Prorate: WIP-account, finished goods, and CGS account

=> product cost partially changes

3. Recalculate each job: at end of the year when actual overhead rate is known

=> product cost changes

Cost allocation and earnings management

Treating under-or over-absorbed overhead is subject to manipulation

You have a large over-absorbed overhead, and you want to minimize taxes. Which alternative would you choose?

- Prorating to inventory, not writing off all to the CGS
- Highest cost of goods sold => lowest profit

Window dressing: Changes in inventory valuation, write-off policies = of interest to auditors, tax authority

Alternative cost allocation methods

=> What we discussed so far: single overhead cost pool for the entire plant (plantwide overhead rate)

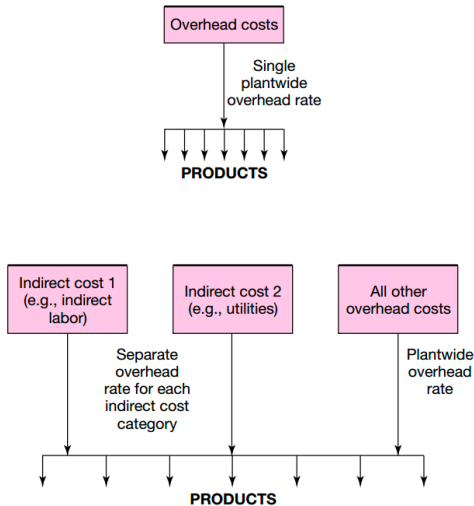
Easiest to apply, but accounting costs may be inaccurate representations of opportunity costs.

=> Multiple allocation bases & overhead rates: each cost pool with its own cost driver: more data processing, but more accurate costing

=> Two-stage allocation of departmental overhead rates

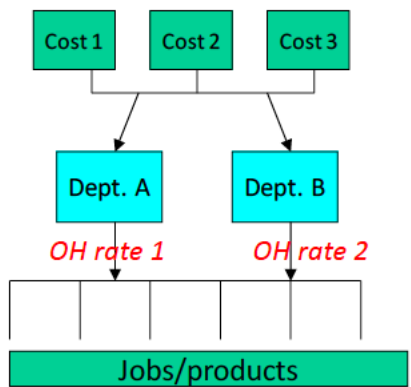
Allocate overhead costs to operating departments, and then to products.

Multiple allocation rates:



Two stage cost allocation by department:

Costs of support pools can be more easily distributed among operating pools rather than products. Costs of operating departments are then allocated to products.



Multiple versus single allocation base(s)

Multiple allocation bases (e.g., activity-based costing): Each cost category has a different allocation base

=> more accurate costing but attention is spread among many allocation bases, thus weaker behavioral effects

Single (plantwide) allocation base

=> Attention to one single factor: strong behavioral effects but less accurate costing (See Merchant & Shield, 1993)

Why a single allocation base?

The practice of using a single allocation base- direct labor-found in many Japanese firms, is another example of the use of a simplistic, relatively inaccurate (low precision) cost system. Although labor costs are a small proportion of the total costs of many products, labor often is an important factor in Japan because its scarcity makes it a constraining resource. Moreover, greater use of technology frequently improves long-term competitiveness by increasing quality, speed and

flexibility. Hence Japanese managers allocate overhead costs using a labor-cost base to focus design engineers' attention on identifying opportunities to reduce the products' labor content.

Is costing accuracy always beneficial?

Article of Merchant & Shields (1993): Accuracy is not always needed

1. Upward-biased cost: Prevent sales managers from giving too much discounts
2. Downward biased costs: Target cost are set too low to stimulate improvement
3. fewer drivers: Too many drivers, difficult to manage, only a few drivers (accuracy ↓), focuses the manager's attention on "key-drivers" of firm value.



Decision management vs. decision control

Few drivers internally 'taxed' (Ch. 9) = easy to control
Too many drivers = Loss of oversight, manipulation by managers

SESSION 10
MODULE 12: ABSORPTION COSTING VERSUS VARIABLE COSTING

Absorption costing creates incentive to overproduce

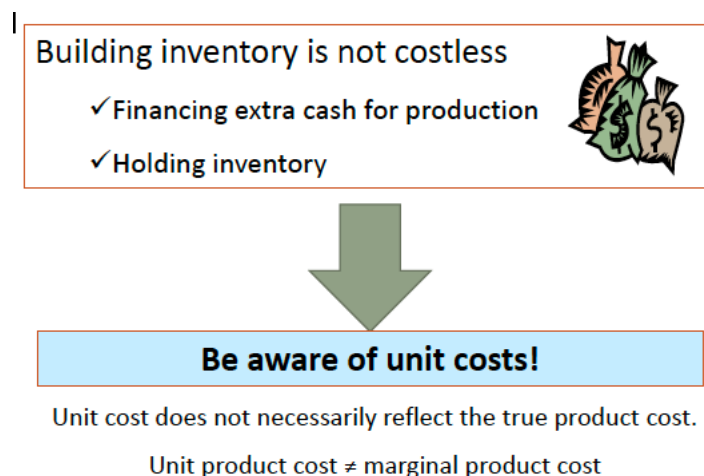
A company sells 1000 units at a price of 12 EUR. The variable cost of production equals 5 EUR. The company incurs 2000 EUR of fixed costs. Prepare the income statement if the firm produces exactly 1000 units. Fixed costs per unit sold = Fixed costs / units produced

	Production units (1000)
Sales revenue (1000 * 12)	12,000
Variable costs (1000 * 5)	5,000
Fixed costs (2,000/1000) * 1000	2000
Profit	5,000

A company sells 1000 units at a price of 12 EUR. The variable cost of production equals 5 EUR. The company incurs 2000 EUR of fixed costs. Prepare the income statement if firm produces 2000 units. Fixed costs per unit sold = Fixed costs / units produced

	Production units (1000)	Production units (2000)
Sales revenue (1000 * 12)	12,000	12,000
Variable costs (1000 * 5)	5,000	5,000
Fixed costs (2,000/2000) * 1000	2000	1,000
Profit	5,000	6,000

By producing more units than units sold, firms can transfer fixed costs from the income statement to the inventory in the balance sheet.



Earnings management in absorption cost accounting

- Earnings management through real activity manipulation: “Overproduction”. By producing more units than units sold, firms can transfer fixed costs from the income statement to the inventory in the balance sheet.
- Earnings management through bookkeeping choices.
 - Inventory choices (LIFO, WA, FIFO)
 - Treatment of the end-of the year overhead differences
 - Normal vs. expected volume

When is earnings management more likely?

- For managers near retirement; near end of tenure; managers quitting the firm
- When rewards/short-term bonus are based on current ROA or profit.
- There is pressure to hit the earnings benchmarks (e.g., analyst forecasts)

Some solutions to mitigate the problem of overproduction:

1. **RESIDUAL INCOME:** % charge of capital or asset (includes inventory)
2. **PENALTY** for overproduction (challenge: what should be an upper-bound of inventory?)
3. **STOCK-BASED** compensation (focus on long-term firm value, stock-building removed)
4. **JIT-production** / produce on order: change decision rights / org. architecture
5. **Variable costing systems** instead of absorption costing

Alternative to Absorption costing

Alternative = Variable costing: Excluding fixed costs from the overhead analysis.

When is absorption costing relevant? Dependent on the type of decision at hand

Absorption costing is helpful for long-term pricing or planning

Absorption costing is not helpful for deciding about a special order (depending on whether one is operating at full capacity or not-different effects on opportunity costs), shutting down a plant, or outsourcing (includes sunk costs)

One solution: Variable costing

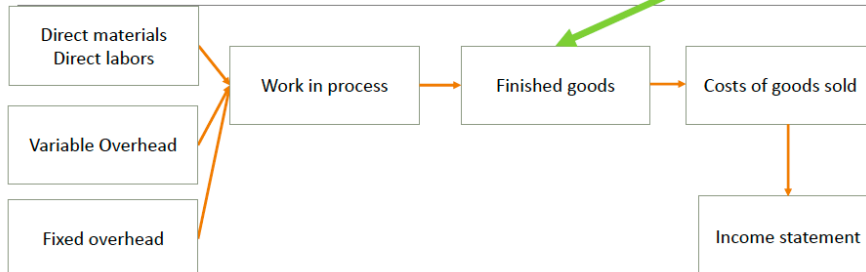
A company sells 1000 units at a price of 12 EUR. The variable cost of production equals 5 EUR. The company incurs 2000 EUR of fixed costs. Prepare the income statement if firm produces 2000 or 1000 units.

Fixed costs per unit sold = Fixed costs / units produced

	Production units (1000)	Production units (2000)
Sales revenue (1000 * 12)	12,000	12,000
Variable costs (1000 * 5)	5,000	5,000
Contribution	7,000	7,000
Other costs (fixed overhead)	2000	2,000
Profit	5,000	5,000

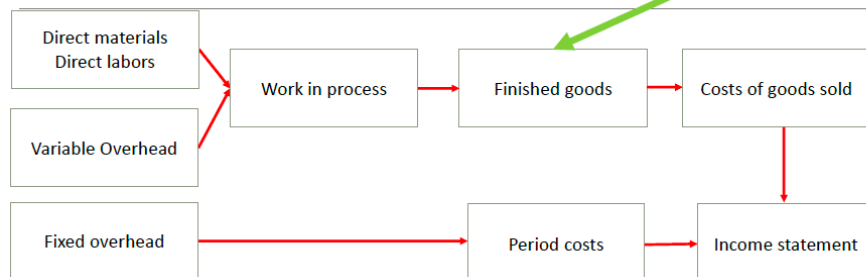
Absorption costing

Product cost = Cost of finished goods



Variable costing

Product cost = Cost of finished goods



Income statement in Absorption Costing

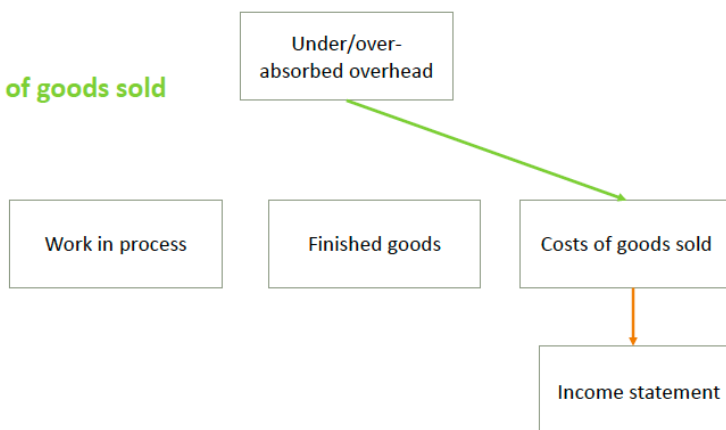
Sales		15,000
Costs of goods sold		- 9,000
Gross Profit		6,000
Less period costs		- 2,000
Variable selling & administrative costs	1,000	
Fixed selling & administrative costs	1,000	
Net income		4,000

Income Statement in Variable Costing

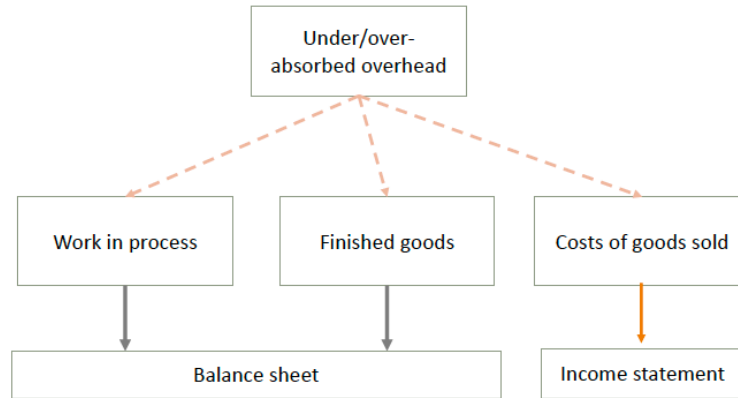
Sales		15,000
Variable costs		- 5,000
costs of goods sold (variable)	4,000	
Variable selling & administrative costs	1,000	
Gross Margin		10,000
Less period costs		- 6,000
Fixed overhead manufacturing costs	5,000	
Fixed selling & administrative costs	1,000	
Net income		4,000

Treating under/over absorbed overhead costs under absorption costing

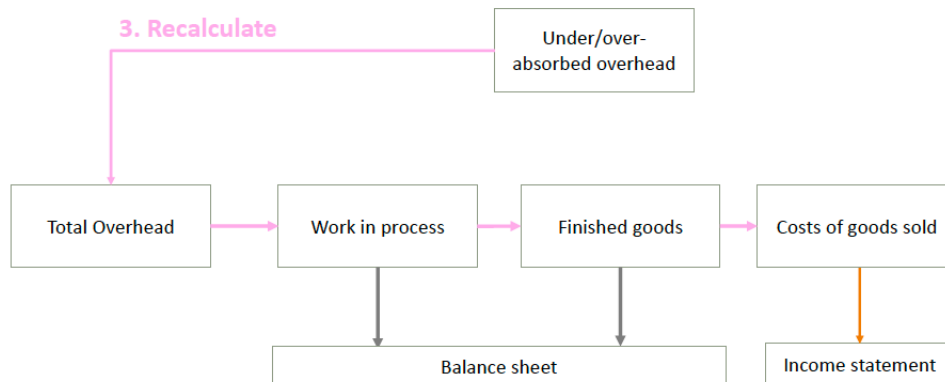
1. Writing off to costs of goods sold



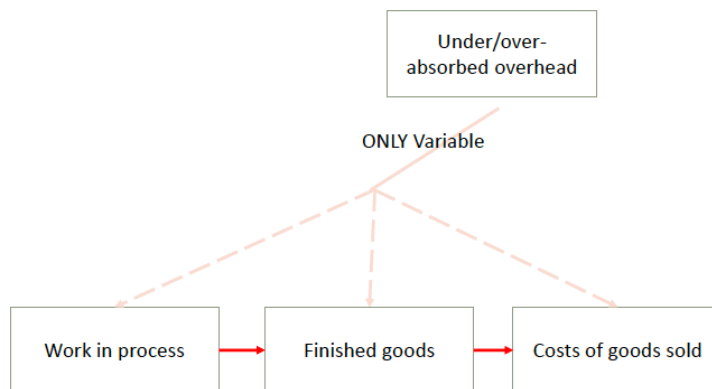
2. Pro-rate



3. Recalculate



Treating under/over absorbed overhead costs under variable costing



However, variable costing has some limitations

In long-run, fixed costs are important

Variable costing ignores capacity costs and does not show the true product cost.

Gaming: some overhead costs are mixed costs (costs of utilities)

Managers may have incentives to treat some costs (under/over-absorbed costs) as variable or fixed costs to impact profit (still in inventory as part of product cost or write off as period costs)

Does variable costing completely solve the overproduction problem?

Not necessarily: by classifying some fixed costs as variable costs, part of the costs can be stored in the inventory as product costs & recoded in the balance sheet.

MODULE 13: INTRODUCTION TO ACTIVITY-BASED-COSTING

Absorption costing may lead to inaccurate product costs in some settings

More heterogeneity in products/services: When firms produce multiple products, absorption costing may not accurately represent the opportunity costs of different products.

- Absorption costing does not clearly show how costs are influenced by the diversity and complexity of the production processes.
- Absorption cost systems assign too few costs to small batches and complex special orders.

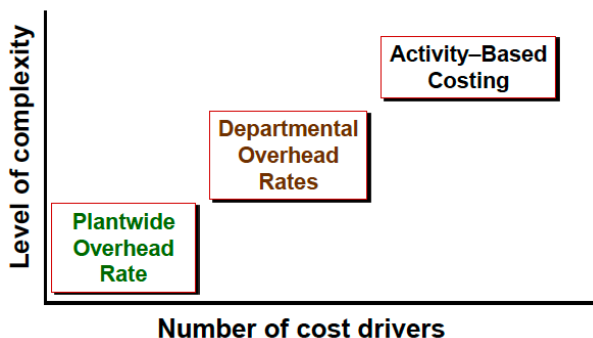
The cost drivers in absorption costing use input/output factors (volume-based costing VBC), such as direct labor hours or machine hours, to allocate overhead costs.

Not adapted to the current production system, e.g., direct labor costs decreased, and overhead costs (indirect support) increased. Estimate: from 5% (early 50's) to 40% or more of total costs. "Taxing" labor hours may be an inappropriate signal.

Activity-based costing: a solution to provide more accurate product costs

- A refined version of absorption costing. It is sometimes used as a supplement to, rather than as a replacement for, the company's usual costing system.
- ABC accounts for the variety and complexity of the production processes. Current allocation bases such as direct labor hours is not enough.
- ABC attempts to find the causal roots of costs & sets allocation bases (cost drivers) accordingly.

ABC, the number of cost drivers, and costing complexity



Central idea: 'Activities' consume the company's resources, and products make different use of activities and thus resources.

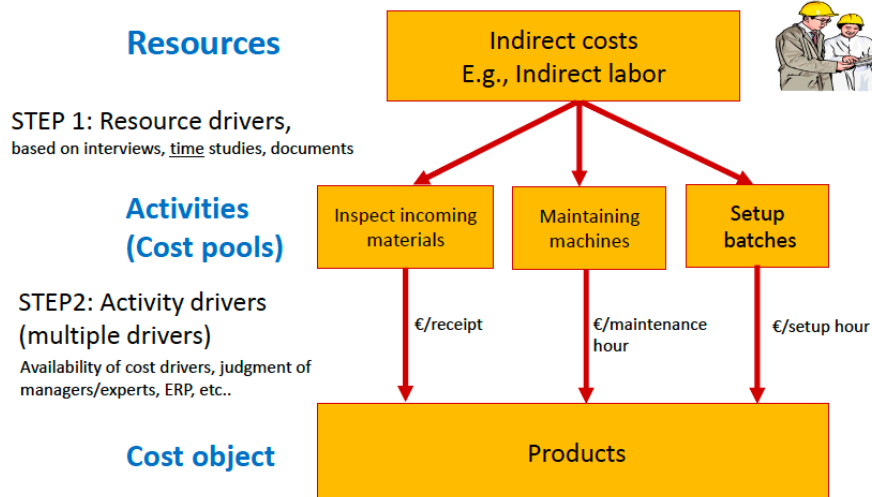
Rationale behind ABC:

ABC raises several related logical questions:

1. Why is the organization spending money on support/indirect resources?
⇒ A set of activities use these resources.
2. Why is the organization performing activities?
⇒ Performing activities to design, build, and deliver products and services to customers.
3. How much is the organization spending on each of its activities?
⇒ Need to identify **resource drivers**
4. How much of each activity (euros) is required for the organization's products/services?
⇒ Need to identify **cost drivers**



Activity-Based Costing: A two step process



Activity-levels

Activities occur at different levels=> costs and cost drivers at different levels

- **Unit-level activities** are performed each time a unit is produced.
- **Batch-level activities** are performed each time a batch is handled or processed, regardless of how many units are in the batch. e.g., setup batches.
- **Product-level activities** relate to specific product lines and must be carried out regardless of how many batches are run or units are produced or sold. e.g., maintaining machines, engineering costs
- **Organization-sustaining activities** are carried out regardless of which products are produced, how many batches are run, or how many units are made. e.g., heating a factory and cleaning executive offices

ABC- allocating costs to products (step 2)

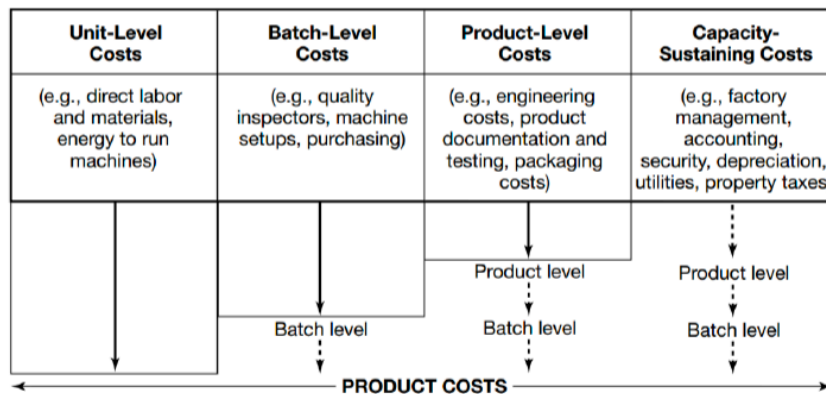


Figure 11-1: Activity-based cost system categorization and allocation of indirect costs

		Complexity	
		Low	High
Volume	High	Overcosted	
	Low		Undercosted

Inaccurate product/client costs
Product subsidization

MODULE 14: ACTIVITY BASED COSTING II

Activity-based Management

Activity-based costing is more than an accounting method. It is an approach to control costs. It focuses attention on “real” drivers of costs. We understand how costs behave.

We keep value-added activities and drop non-value-added activities:

- A value-added cost is the cost of an activity that cannot be eliminated without affecting a product’s value to the customer.
- Nonvalue-added costs are costs that can be eliminated without affecting a product’s value to the customer.

=> Potentially: Reorganization of activities, processes (expensive activities)

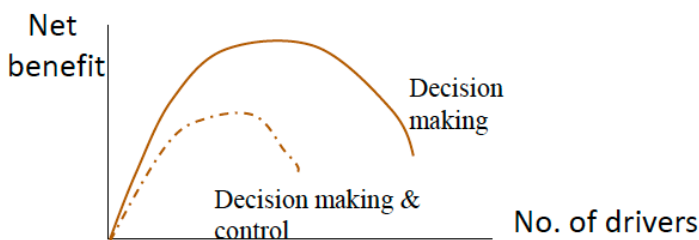
Benefits of ABC

- More detailed analysis of overhead (some cost are made semi-variable with batch level, product level)
- Better for long-term pricing policies
- Product mix decisions: which products we focus on
- Positive profitability effects (change in way of thinking) óPeople become more “cost conscious”

Costs of ABC

- Increasing the number of cost drivers increases accuracy (lower cost of decision errors),
- But cost of measurement/data gathering and updating data increases (more drivers, higher cost).
- More drivers mean more discretion (cost of misreporting, discretion)

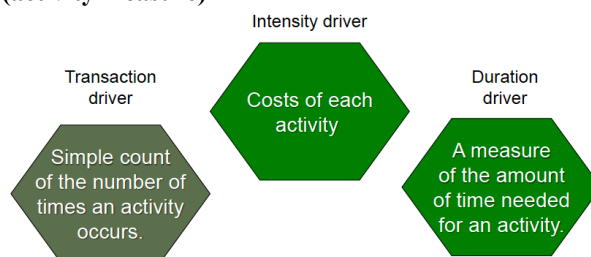
REWARD on activity drivers; DECISION RIGHTS to induce changes, SUPPORT of TOP Management; Expensive REGISTRATION, IT; ABC can create CONFLICT (Krumwiede, 1998; Shields, 1997)



Misunderstanding of ABC

- ABC is not a solution to all problems!
- ABC does not well reflect the joint benefits of products. Products can still be ‘loss-products’ under ABC.
- ABC is not without error!

Common types of cost drivers (activity measure)



Time-driven ABC: focusing on duration drivers

Traditional ABC: survey employees and see how much time they spend on each activity and then allocate the total (department) costs to each activity. Then we find the cost-driver rate (depending on the cost driver), e.g., number of orders processed, number of inquiries handled,....

Time-driven ABC: (considers complexity of production)

- Managers estimate the cost of resources: Considers practical capacity (machine breakdown, employee arrival, breaks, training sessions) => theoretical capacity is not used to make products or offering services. (80% to 90% are often used)
- Managers estimate the time of each sub-activity and finds cost per minute per sub-activity. Then we can make the time equation for the entire activity:

Packaging Time = 0.5 + (2.5 (inquires handled) + 0.1(normal assembly)+ if (0.2 (complex assembly)

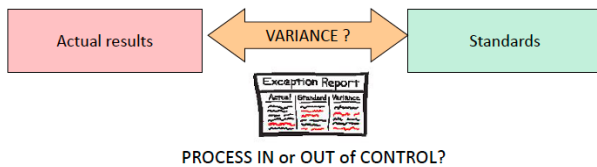
SESSION 11

MODULE 15: INTRODUCTION TO STANDARD COSTING

Standard cost: “Expected or desired cost” that is reasonably required to achieve a given objective under specified conditions = FUTURE oriented target (ideal).

A standard is a benchmark for measuring performance. Setting a standard, comparing the standard and actual result & analyzing the difference (variance analysis).

Standard cost per unit is set at the beginning of a budget period, based on expectations (budget plan).



Why standard costing?

Benchmark for decision control (comparing actual costs against standard costs provides a control system). Large variances between standard and actual cost can signal an “out of control” process.

Provide more accurate information for decision making, past costs are often misleading (can contain inefficiencies); Standard cost should be closer to opportunity cost.

Process pricing, make or buy decisions -> we don’t have to wait for actuals!

Bonus calculation & performance evaluation of managers. Actual material, labor use and other overhead cost against standard cost so that each department is just responsible for their own variance against the standard.

Coordination among various departments

- Implicit contract: “marketing knows” a minimum price for COGS.
- Production guarantees manufacturing at a given standard cost.
- Purchasing has a clear idea on which materials should be bought.

However, frictions can occur (see later)

Methods to set a standard cost

1. **Past documents:** bill of materials, routine sheet: historical cost + adjustment
2. **Engineering Method (ABC):** observation of employees, measure materials
3. **Zero based budgeting:** e.g., each period = new assumptions to reflect
4. **Benchmarking:** Internal (across divisions) vs. external (competition)
5. **Target costing**

Target costing

Aggressive cost management in new product development

Instead of bottom up costing: costing starts from selling price & desired profit (top down costing). Understanding customers’ needs and competitors

- What should be the selling price to compete in the market?
- How much contribution margin we expect?
- What is the desired cost level?

Target cost = Target Price - Target Profit

Target cost is given to engineers and managers to design a product.

Unlike traditional cost control systems, which do not control costs until production begins, cost control starts when design of a product starts.

Emphasizing cost control early in the design stage (e.g., automobile). Many costs cannot change after the product design is over.

Note that target costing is to maximize product profitability, not to minimize costs. Changes the focus of product development team from “nice to have” to “need to have” features in designing products (see Olympus in Cooper & Chew 1996)

MODULE 16: STANDARD COSTING II

Calculating Labor Variance & Materials Variance

Direct Labor Variances:

Direct labor variance = Actual cost of labor – Standard cost of labor

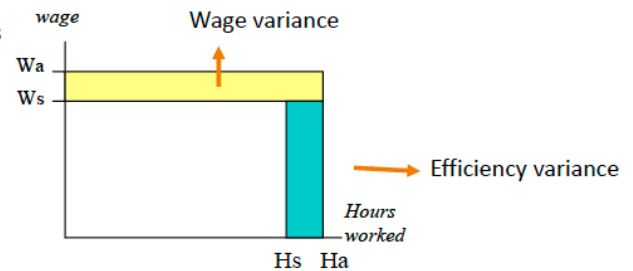
Wage variance = (Actual wage - standard wage) x Actual hours +

Efficiency variance = (Actual hours - Standard hours) x Standard wage

Actual cost of labor = Actual wage x Actual hours

Standard cost of labor = Standard wage x standard hours

Labor variance= Wage variance: $(W_a - W_s) \times H_a$ +
Efficiency variance : $(H_a - H_s) \times W_s$

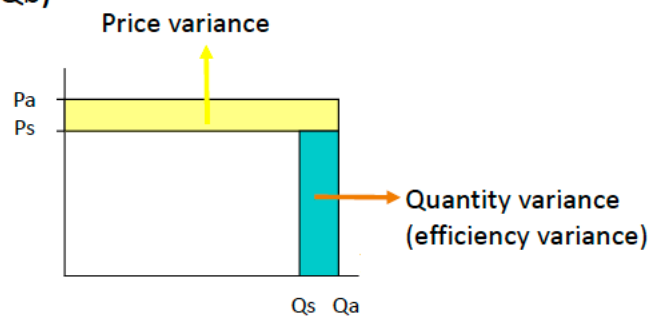


Materials Variance (no inventory):

Materials variance without inventory= $(Q_a \times P_a) - (Q_s \times P_s)$

Actual quantity (Q_a)= purchased quantity (Q_b)

Price variance: $\Leftrightarrow (P_a - P_s) \times Q_a$
Efficiency variance: $\Leftrightarrow (Q_a - Q_s) \times P_s$



Materials Variance (with inventory)

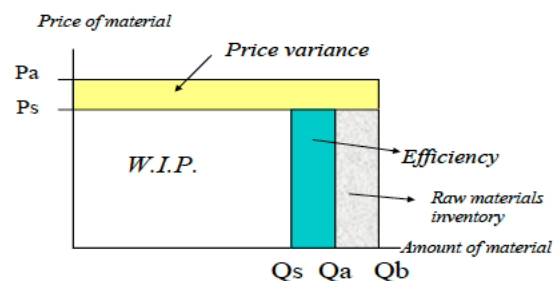
Materials variance= $(P_a \times Q_b) - (P_s \times Q_s)$

Inventory problem, not all materials bought are used in the process, solution:

→ Price variances against quantities bought (Q_b)

→ Efficiency variance: Standard Used (Q_s) vs. actually transferred to the WIP account (Q_a)

Price variance: $\Leftrightarrow (P_a - P_s) \times Q_b$
Efficiency variance: $\Leftrightarrow (Q_a - Q_s) \times P_s$



Bookkeeping using standard costing

Materials are recorded in the raw materials inventory account at a standard cost. The price & efficiency variance are recorded in separate variance accounts. This helps to assign responsibilities .

Price = Procurement (materials), HRM (wage)

Efficiency = Dept. head, production manager, nursing head in hospital

DISPOSAL of VARIANCES (end of year):

1.COGS (P&L)


2.Pro-rate – COGS (P&L), FG (Balance Sheet)


3.Recalculate

Firms often write off variances to costs of goods sold if they are not large

- Product costs and standard costs do not differ
- If volume drops, efficiency variance goes up because of idle employees, or if purchasing costs increase temporarily, the product cost does not send a wrong signal to managers that the actual product cost changed and thus a higher selling price is necessary.

Unfavorable and favorable variances

Favorable variance: Actual costs  Standard costs

Unfavorable variance: Actual costs  Standard costs

Attention!

- Be careful in using variances in performance evaluation (how much weight they should get?)
- (un)favorable variances are not necessarily (bad) good. Don't lose the big picture.
- One favorable variance (e.g., price variance) might be associated with another unfavorable variance (e.g., quantity variance).
- It is not enough to analyze the operations only based on cost variances. Pay attention to both qualitative and quantitative production factors.

Challenges in setting a standard

1. Who should set the standard? Top down versus Bottom up
 - I) Bottom up: employees are best informed: specialized knowledge=> more accurate
 - II)Bottom up: Standards may become less tight!
2. Choice between tight and loose control
3. Maintaining the accuracy of standards. Revising the standard?

Recall the trade off between control and decision making:

In case of large variances => standards can become obsolete. If done frequently => lower motivation to control costs

Most of the time: fixed for a period (more emphasis on control)

Dysfunctional effects of standards

1. Externalities: conflicts can arise

Purchasing manager, human resources: can impose cost on production

Low quality materials and labor lead to more rework, scrap (efficiency)

But also the other way around; Production -> Purchasing e.g., rush order, production needs new materials fast (purchasing cannot look for the best price)

2. Discourage cooperation = goal incongruence

Externalities can create conflict

Individual responsibilities for variance, do not motivate cooperation

3. Stock building

Purchasing manager buys large bulks; to receive discounts

Shops around to receive lowest price

Solutions? Penalty for stock building (reward), JIT (decision rights), tie part of perf. to residual income (measurement)

4. Micromanagement and sub optimization

Price and efficiency for every material component, for every labor force

Sub optimization: minimization in one department; other dept. can suffer

5. Large variances: good or bad news?

Large favorable variance: Quality?

Large unfavorable variance : Standard still OK??

Still a lot of interpretation needed , no insights in the cause

Financial (past reflection); motivates short term thinking!

6. Standards may become obsolete in automated production so quickly because of frequent changes in products or processes.

Some ways to lower the costs of standard costing

1) Maintaining standards on aggregated levels.

Instead of keeping detailed standard hours for each distinct labor process used in manufacturing, using standard costs at the product level or subassembly level.

2) Mutual monitoring, group based bonus (bonus pools)

Purchase & production monitor each other's actions !

Group level targets; BUT free riding problem

Often bonus pools in addition to standards

3) Balanced scorecard: forward looking

Companywide; no micro management; motivates working to incorporate strategy

Long term, non-financial, drivers of performance = future oriented

Problems of standard/budgets in incentive schemes

Consider a firm which offers the following contract to the employee.

The firm sets a standard (Budget B) based on actual realizations of prior period. The bonus at the end of the year is:

$$\begin{cases} A_t < B(A_{t-1}) & \text{then no pay} \\ A_t > B(A_{t-1}) & \text{then 10.000 euro bonus.} \end{cases}$$

Q: Good system why/why not??

Consider B as standard amounts of sales, min. levels of cost reduction, certain level of favorable price and efficiency variances

Two problems:

The fixed bonus when performance is above a certain target does not motivate people to go beyond the target

The firm uses actual realizations of prior period. If performance is excellent this year, next year target will be higher/ "ratcheting up" of standards. Reluctant to go beyond target.

BUDGET RATCHETING: upward adjustments are more likely

Game = 'SATISFICING' behavior = just realize the target/standard

IF target is achieved: withhold profits, revenues

IF target will be missed: miss it to a large extent to make room for positive achievements next year (deep dive)

Consider a firm which offers the following contract to the employee. The employee receives a fixed wage + a variable bonus for exceeding budget performance. The employee can submit its target (standard) to superior (bottom-up budgeting).

$$\begin{cases} A_t < B \text{ then } 100 \text{ fixed wage} \\ A_t > B \text{ then } 100 + 0.4 (A_t - B). \end{cases}$$

Q: Good system why/why not??

Problem: What is optimal given that the employee knows he can realize 70 (e.g., sales)?

PROPOSED BUDGET = _____

Game: BUDGETARY SLACK

Employee/manager are not eager to reveal their true expectations

Reasons: All realizations above standard are rewarded

Large underestimations of standards/budgets possible

Especially under high information asymmetry

Positive things:

Empowerment, no ratcheting effects of upper management

Can create motivation, employee is involved

Slack provides breathing room, managers can think of the long term

Consider a firm offering the following contract. The contract asks for a specification of the budget from its employee. A bonus is paid for exceeding the target and a penalty when realizations < budget.

$$W = 100 + 0.4B + 0.2 (A_t - B) \text{ if } A_t > B$$

$$W = 100 + 0.4B - 0.6 (B - A_t) \text{ if } A_t < B$$

Q: The employee knows that he will be able to realize 70

(top manager does not know this).

What should he propose as a budget (B)?

SESSION 12
MODULE 17: OVERHEAD VARIANCE ANALYSIS

Three ways to quantify volumes:

- 1) **Budgeted volume** (see the previous slide) (BV) (set at the beginning of the year)
The budgeted number of product units \times the standard number of input per unit
- 2) **Standard volume (SV)** (available at the end of the year)
How much input (volume measure) should have been used.
The number of product units produced \times the standard number of input per unit
- 3) **Actual volume (AV)**
The amount of the volume measure actually occurred (actual machine hours used, actual direct labor hours)

Absorbed overhead costs

In standard costing overhead is allocated using a standard volume, not an actual volume of driver.

Absorbed overhead = (budgeted) overhead rate \times standard volume (SV)

Total overhead variance

Total over/under absorbed overhead = Actual overhead cost (AOH) - Overhead absorbed cost

Adding and deducting flexible budget at actual volume and flexible budget at standard volume = Spending variance + Efficiency variance + Volume variance

Three overhead variances:

1. **Spending variance** = Actual overhead cost - Flexible budget at actual volume = $AOH - [FOH + (VOH \times AV)]$
2. **Efficiency variance** = Flexible budget at actual volume - Flexible budget at standard volume = $[FOH + (VOH \times AV)] - [FOH + (VOH \times SV)] = VOH \times (AV - SV)$
3. **Volume variance** = Flexible budget at standard volume - Absorbed overhead = $FOH + (VOH \times SV) - [(FOH/BV + VOH) \times SV] = FOH - (FOH \times SV)/BV = FOH \times (BV - SV)/BV$

Spending variance: $AOH - [FOH + (VOH \times AV)]$

The difference between the actual overhead and how much overhead should have been incurred for the actual volume measure used.

-Unexpected change in the price of variable overhead items (e.g., electricity, oil used to cool cutting tools) or fixed overhead costs (e.g., energy, building rents)

-Change in the technology made the current cost driver (e.g., direct labor hours) less accurate

Efficiency variance: $VOH \times (AV - SV)$

Captures inefficiencies in using variable overhead

Volume variance: $FOH \times (BV - SV)/BV$

Captures overused or underused capacity of the facility

MODULE 18: MARKETING VARIANCE ANALYSIS

Marketing variance

Variance analysis is useful not only in manufacturing settings, but also in non manufacturing settings= > Marketing variances

Marketing variance = Actual price \times Actual quantity - Standard quantity \times Standard price

Price variance = (Actual price - Standard price) \times Actual quantity

Quantity variance = (Actual quantity - Standard quantity) \times Standard price

Two components of quantity variance

Quantity variance can be decomposed to two variances in case of multiple products (particularly when products can be substitutes)

- **Mix variance** = (Actual mix % - Standard mix %) \times Actual units of all products sold \times Standard price
- **Sales variance** = (Actual units of all products sold - Standard units of all products sold) \times Standard mix % \times Standard price

The mix variance captures the effect of substitution among the products. How much of the quantity variance is due to the change in product mix, holding the number of units constant, whereas the sales variance measures the effect of differences between actual and standard quantities sold.