

Summary

-Management Accounting and Control-



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Chapter 1

Information system; consists of:

- Formal, organized, tangible records such as payroll and purchasing documents.
- Informal, intangible bits of data such as memos, special studies, opinions, etc.

Control system: Includes performance measures and incentive compensation systems, promotions, demotions, terminations, security guards and video surveillance, internal auditors, and the firm's internal accounting system.

Internal accounting system: Includes budgets, data on the costs of each product and current inventory, and periodic financial reports. Internal accounting systems serve two purposes:

- (1) To provide some of the knowledge necessary for planning and making decisions.
- (2) To help motivate and monitor people in organizations.

An internal accounting system should have the following characteristics:

- Provide the information necessary to identify the most profitable products or services and the pricing and marketing strategies to achieve the desired volume levels.
- Provide information to detect production inefficiencies to ensure that the proposed products and volumes are produced at minimum cost.
- When combined with the performance evaluation and reward systems, create incentives for managers to maximize firm value.
- Support the financial accounting and tax accounting reporting functions.
- Contribute more to firm value than it costs.

Accounting systems have three functions:

- (1) Decision making
- (2) Performance evaluation
- (3) External reporting

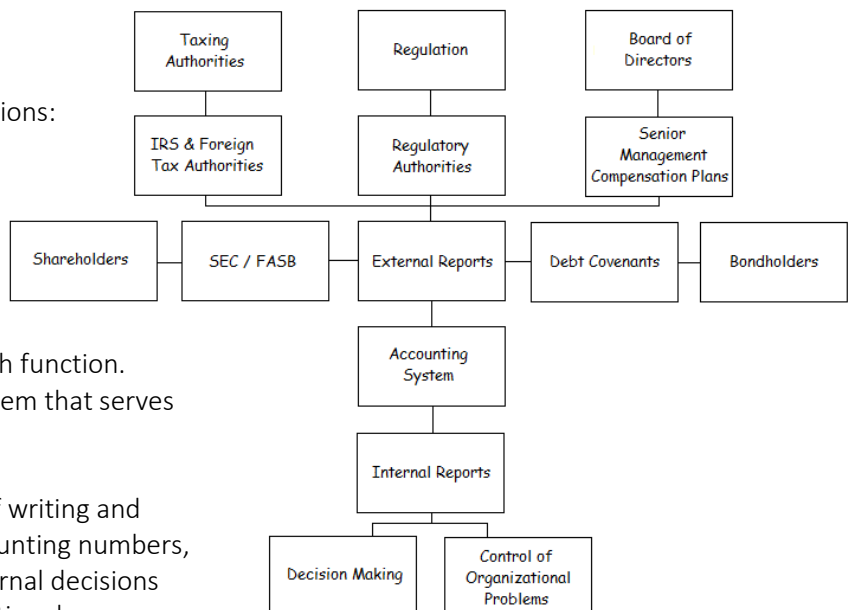
Two types of accounting systems;

- *Multiple system*: One for each function.
- *Single system*: One basic system that serves all three functions.

The decision depends on the costs of writing and maintaining contracts based on accounting numbers, the costs from the dysfunctional internal decisions made using a single system, the additional bookkeeping costs arising from the extra system, and the confusion of having to reconcile the different numbers arising from multiple accounting systems.

Economic Darwinism:

In a competitive world, if surviving organizations use some operating procedure over long period of time, then this procedure likely yields benefits in excess of its costs. Firms survive in competition by selling goods or services at lower prices than their competitors while still covering costs. Firms cannot survive by making more mistakes than their competitors.

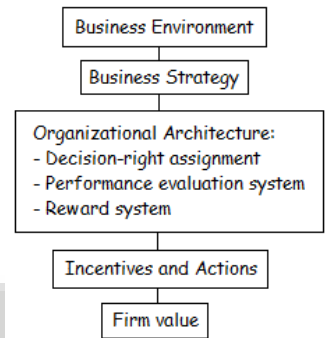


Two caveats must be raised concerning too strict an application of economic Darwinism:

- (1) Some surviving operating procedures can be neutral mutations. Just because a system survives does not mean that its benefits exceed its costs. Benefits less costs might be close to zero.
- (2) Just because a given system survives does not mean it is optimal. A better system might exist but has not yet been discovered.

Framework for organizational change and management accounting:

This is a framework for understanding the role of accounting systems within firms and the forces that cause accounting systems to change. Changes in the business environment leads to new strategies and ultimately to changes in the firm's organizational architecture, including changes in the accounting system to better align the interest of the employees to the objectives of the organization. The new organizational architecture provides incentives for members of the organization to make decisions, which leads to a change in the value of the organization.



Some things you have to notice when you work with accounting numbers:

- Beware of average costs.
- Use opportunity costs.
- Supplement accounting data with other information.
- Use accounting numbers as performance measures cautiously.

Financial accountant vs management accountant:

Financial accountants:

- Prepare reports, generally based on past performance; in line with reporting requirements.
- Produce the required financial information for use by other functions within business.

Management accountants:

- Collate information such as revenue, cashflow and outstanding debts to produce timely trend reports and statistics to inform important day-to-day management and business decisions (forward looking).
- Combine financial information with non-financial information data to paint a complete picture of the business. They use this to drive business success.

Chapter 2

Opportunity costs: The benefit forgone as a result of choosing one course of action rather than another. Opportunity costs can be determined only within the context of a specific decision and only after specifying all the alternative actions.

Opportunity set: set of alternative actions available to decision-maker.

Characteristics of opportunity costs:

- Include tangible and intangible benefits
- Measured in cash equivalents
- Rely on estimates of future benefits
- Useful for decision-making

Sunk costs and opportunity costs

- *Sunk costs:* expenditures incurred in the past that cannot be recovered.
- Sunk costs are no opportunity costs – irrelevant for decision-making.

Marginal costs: Cost of producing one more unit.

Average costs: Total costs divided by the number of units produced.

Variable costs: The additional costs incurred when output is expanded.

Fixed costs: Costs incurred when there is no production.

- Fixed costs vary over time due to changes in prices, but do not vary with changes in the number of units produced.

The cost of changing production levels is not always easy to estimate. Some approximations:

- *Linear approximation:* estimating total cost requires an estimate of the y-axis intercept and the slope of the straight line. The intercept approximates the fixed costs and the slope of the straight line is the variable cost per unit.
 - *Relevant range:* range of production where total fixed costs and variable costs per unit remains constant.
 - Total cost = Fixed cost + (Variable cost per unit)(Units produced).

Step costs: Expenditures fixed over a range of output levels.

Mixed costs: Cost categories that cannot be classified as being purely fixed or purely variable.

In many costing situations, managers choose a single activity measure. *The cost driver* is that measure of physical activity most highly associated with variations in cost. The problem with using a single activity measure is that it can be correct for one class of decisions but incorrect for others.

Cost-Volume-Profit Analysis: this is a way to find out how changes in variable costs and fixed costs affects a firm's profit (example: break-even analysis). The examination of cost behavior patterns that underlie the relationships among cost, volume of output and profit. The major benefit of CVP is that it forces managers to understand how costs and revenues vary with changes in output.

- *Contribution margin:* Price – Variable costs.
- *Break-even point:* Fixed costs / Contribution margin.

The profit-maximizing point of output occurs when marginal revenue equals marginal cost (MC=MR). Marginal revenue refers to the receipts from the last unit sold.

$$\begin{aligned} \text{'Break-even profit' } \rightarrow \quad \text{Profit} &= 0 = [(P - VC) \times Q_{BE} - FC] \\ &= 0 = (SP \text{ per unit} \times \text{Units sold}) - (VC \text{ per unit} \times \text{Units sold}) - FC \\ \text{'Target after-tax profit' } \rightarrow \quad \text{Profit}_T &= T = [(P - VC) \times Q_T - FC] \times (1 - t) \end{aligned}$$

The underlying assumptions / Limits of Cost-Volume-Profit Analysis:

- Price and variable cost per unit must not vary with volume.
- CVP is a single-period analysis. All revenues and costs occur in the same time period.
- CVP analysis assumes a single-product firm. All fixed costs are incurred to produce a single product. If the firm produces multiple products, and fixed costs such as property taxes are incurred to produce all the products, then the break-even point of target profit for any one of the products depends on the volume of the other products. With multiple products and common fixed costs, it is not meaningful to discuss the break-even point for just one product.
 - Solution: Assume a constant output mix of bundles with fixed proportions of the multiple products.

Operating leverage measures the sensitivity of profits to changes in sales. The higher the operating leverage, the greater the firm's risk. In firms with high operating leverage, small percentage changes in volume lead to large percentage changes in net cash flows (and profits).

- Operating leverage: Fixed costs / Total costs.

Unavoidable costs: Costs that will continue to be incurred regardless of the decision.

Avoidable costs: Are those costs that will not be incurred if an existing operation is closed or changed, avoidable costs are opportunity costs.

Opportunity costs: Estimated costs before the decision.

Accounting costs: Recorded costs after the decision.

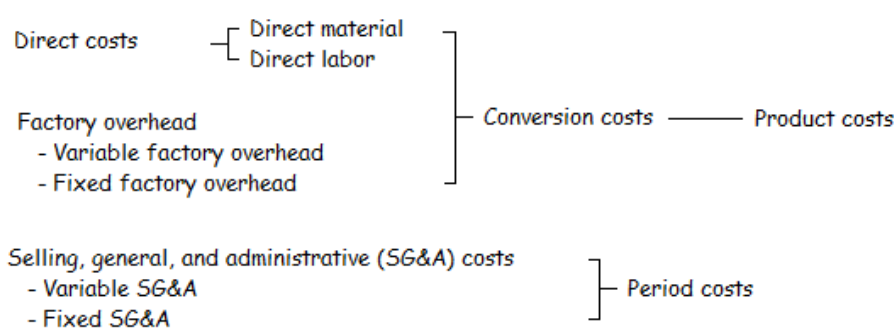
Product costs: Include all those accounting costs incurred to manufacture a product.

Period costs: Those costs that are expensed in the period in which they are incurred.

Direct costs: Those items that are easily traced to the product or service (direct labor/material).

Overhead costs: Includes indirect labor and materials as well as other types of general manufacturing costs that cannot be directly traced to units being produced.

- *Conversion costs:* Direct costs + Overhead costs.



Two approaches to cost estimation:

- (1) *Account classification:* Each account is classified as being either fixed or variable.
- (2) *Motion and time studies:* Industrial engineers estimate how much time a particular task or work activity requires with the goal of determining the optimal work method.

Chapter 4

The underlying concepts of motivating and controlling behavior in organizations:

- (1) *Self-interested behavior, team production, and agency costs.*

Individuals coalesce to form a firm because it can:

- Presumably produce more goods or services collectively than individuals are capable of producing alone.
- (Thus,) generate a larger opportunity set.

Self-interested behavior: individuals act in their own self-interest to maximize utility.

Free-rider problem: The incentive to shirk in team production.

Horizon problem: Managers expecting to leave the firm in the near future place less weight than the principal on those consequences that may occur after they leave.

Agency problem: Agents' pursuit of their self-interest instead of the principal's.

- *Agency costs:* The decline in firm value that result from the agency problem.
- *Goal incongruence:* Individual agents have different goals from their principals.

Agency cost are reduced by monitoring and bonding activities. Agency costs are limited by the existence of a labor market for managers, competition from other firms, and the market for corporate control.

(2) *Decision rights and rights systems.*

Decision rights: If an individual is given decision-making authority over some decision. The question of whether the organization is centrally managed or decentralized is an issue of decision right assignment. *Employee empowerment* is a term that means assigning more decision right to employees (i.e. decentralization).

(3) *Role of knowledge and decision making.*

Because knowledge is valuable in decision making, knowledge and decision making are generally linked; the right to make the decision and the knowledge to make it usually reside within the same person. Although they are rational and self-interested, individuals have limited capacities to gather and process knowledge.

(4) *Markets versus firms.*

Production occurs either within a firm or across markets. Firms lower certain transaction costs below what it would cost to acquire equivalent goods or services in a series of market transactions. When a firm can substitute one transaction that occurs inside the firm for a series of external market contracts, total contracting costs usually are lower. Rule of thumb: the higher transaction costs, the better to make things yourself.

(5) *Influence costs.*

By not assigning the decision right to a specific individual, influence costs are lowered because there is no one to lobby. The firm benefits from a reduction in influence costs but it is little affected by the particular outcome of the decision process.

- *Influence costs:* Consist of the forgone opportunities arising from employees trying to affect decisions by politicking and other potentially nonproductive influence activities. Influence costs arise when employees waste valuable time trying to influence decisions.

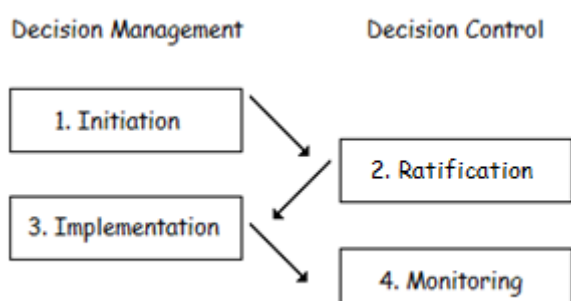
Organizational architecture: All organizations must construct three systems;

- (1) A system that measures performance.
- (2) A system that rewards and punishes performance.
- (3) A system that assigns decision rights.

These three systems make up the firm's organizational architecture. They're like the legs of a three-legged stool. All legs are needed to be in balance. Organizational architecture is performed automatically by markets but must be performed by (costly) administrative devices inside the firm. Perhaps the most important mechanism for resolving agency problems is a hierarchical structure that separates decision management from decision control.

- *Decision management:* Refers to those aspects of the decision process in which the manager either *initiates* or *implements* a decision.
- *Decision control:* Refers to aspects of the decision process whereby managers either *ratify* or *monitor* decisions.

The following steps in the decision process occur:



Example – Hire a new employee:

- (1) Initiation: The request to hire a new employee.
- (2) Ratification: The approval of the request.
- (3) Implementation: Hiring the new employee.
- (4) Monitoring: Assessing the performance of the hired employee at periodic intervals to evaluate the person who hires the employee.

Accounting data are often criticized as not being useful for decision management, but their usefulness for decision control is frequently overlooked. To the extent financial measures are used for decision control and nonfinancial measures are used for decision management, the following implications arise:

- Financial measures are not under the complete control of the people being monitored.
- Non-accounting measures are often timelier than accounting measures.
- Not every decision requires ratification or monitoring.
- Operating managers tend to be dissatisfied with financial measure for making operating decisions.

Chapter 5

Responsibility accounting: Begins with formal recognition of subunits as responsibility centers. A responsibility accounting system is part of the performance evaluation system used to measure the operating results of the responsibility center.

All departments have certain decision rights. But how do you hold this different business units from the organization responsible for the things they're doing? The decision rights assigned to a subunit categorize the unit as a cost center, a profit center, or an investment center. The particular decision rights assigned to a subunit are the key determinants of how the unit's performance is evaluated and rewarded.

Cost center: Established whenever a subunit is assigned the decision right to produce some stipulated level of output and the unit's efficiency in achieving this objective is to be measured and rewarded. The head quarter either state the output or the budget for the cost center.

<i>Decision rights</i>	<i>Performance measures</i>	<i>Typically used when</i>
Input mix (labor, materials, supplies)	Minimize total cost for a fixed output	Cost center manager can measure output, knows the cost functions, and can set the optimal quantity and appropriate rewards
	Maximize output for a fixed budget	Cost center manager can observe the quality of the cost center's output
		Cost center manager has knowledge of the optimal input mix

Profit center

<i>Decision rights</i>	<i>Performance measures</i>	<i>Typically used when</i>
Input/Product mix	Actual profits	Profit center manager has the knowledge to select the optimal product mix

Selling prices (or output quantities)	Actual compared to budgeted profits	Profit center manager has the knowledge to select the optimal price/quantity
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Investment center

<i>Decision rights</i>	<i>Performance measures</i>	<i>Typically used when</i>
Input/Product mix	Net income	Investment center manager has the knowledge to select the optimal product mix
Selling prices (or output quantities)	Actual ROI / Actual residual income (RI)	Investment center manager has the knowledge to select the optimal price/quantity
Capital invested in center	Actual compared with budgeted ROI / RI	Investment center manager has the knowledge about investment opportunities

- Net income: Revenues – Expenses.
- Return on investments: Net income on investments / Total assets invested.
 - Return on total assets (ROA)
 - Return on net assets (RONA)
- Residual income: Measures divisional performance by subtracting the opportunity cost of capital employed from division profits (after excluding any interest expense included in division profits).

Another measure for performance is the Economic Value Added (EVA):

Adjusted net income – (Weighted average cost of capital x capital invested).

Economic Value Added ≠ Residual Income; the two differ in three ways.

- (1) Different accounting procedures are often used to calculate 'adjusted accounting earnings' than are used in reporting to shareholders.
- (2) The EVA formula uses a weighted average cost of capital, which reflects the cost of equity and debt.
- (3) Many companies implementing EVA not only adopt EVA as their performance measure but also link compensation to performance measured by EVA.

Controllability principle: Holding managers responsible for only those decisions for which they have authority.

- *Controllable costs:* All costs affected by a manager's decisions.
- *Uncontrollable costs:* All costs that are not affected by the manager.

Some people argue that managers' performance should be judged solely on those items under their control but not on costs over which they have no influence. A strict application of the controllability principle has two major drawbacks.

- (1) Holding managers accountable for only those variables directly under their control does not give them an incentive to take actions that can affect the consequences of the uncontrollable event.
- (2) The controllability principle ignores the often-useful role of relative performance evaluation, in which performance is judged relative to how some comparison group performed instead of evaluating by absolute standards.

Two important points must be stressed regarding the controllability principle:

- Performance measurement schemes used mechanically and in isolation from other measures are likely to produce misleading results and induce dysfunctional behavior.

- No performance measurement and reward system work perfectly.

When goods are transferred from one profit (or investment) center to another, an internal price (*the transfer price*) is assigned to the units transferred. There are two main reasons for transfer pricing within firms:

- *International taxation*: When products are transferred overseas, the firm's corporate tax liability in both the exporting and importing country is affected.
- *Economics of transfer pricing*: Whenever responsibility centers transfer goods or services among themselves, measuring their performance requires that a 'transfer price' be established for the goods and services exchanged.
 - The choice of transfer pricing methods does not merely reallocate total company profit among business units; it also affects the firm's total profit. The method used can change the profitability of the firm as a whole because the buying/selling divisions changes its scale of operations in response to the transfer price.
 - The transfer price that maximizes firm value is quite simple to state: The optimal transfer price for a product or service is its opportunity cost.

There are at least four different methods that firms use to approximate the transfer price:

(1) *Market price method*: Given a competitive external market for the good, the product should be transferred at the external market price.

<i>Advantages</i>	<i>Disadvantages</i>
Objective.	Might not exist for specialty items.
Often leads to correct long run make/buy decisions.	Might not capture interdependencies among divisions.
Less subject to manipulation.	

(2) *Variable production cost method*: Variable cost represent the value of the resources forgone to produce one more unit.

<i>Advantages</i>	<i>Disadvantages</i>
Can approximate the opportunity cost of transferring one more unit.	Does not allow the selling division to recover its fixed costs.
Gives the buying division incentive to purchase the correct number of units if selling division has excess capacity.	Selling division has incentive to classify fixed costs as variable costs.
	Variable cost might vary with output.

(3) *Full cost method*: Full cost includes both direct materials and labor as well as a charge for overhead.

<i>Advantages</i>	<i>Disadvantages</i>
Avoids disputes over which costs are fixed and which are variable.	Selling division can export its inefficiencies to the buying division.
Simplicity.	Buying division purchase too few units.

(4) *Negotiated pricing method*: This method can result in transfer price that approximate opportunity cost because the manufacturing division will not agree to a price that is below its opportunity cost and the distribution division will not pay a price that is above the product's price elsewhere.

<i>Advantages</i>	<i>Disadvantages</i>
Both selling and buying divisions have incentives to transfer the number of units that maximize their combined profits.	Depends on the relative negotiating skills of the two divisions.
	Time-consuming.

(5) *Reorganization*; The solution if all else fails.

<i>Advantages</i>	<i>Disadvantages</i>
Eliminates costly disputes over transfer pricing.	Reduces the benefits from having two decentralized responsibility centers.

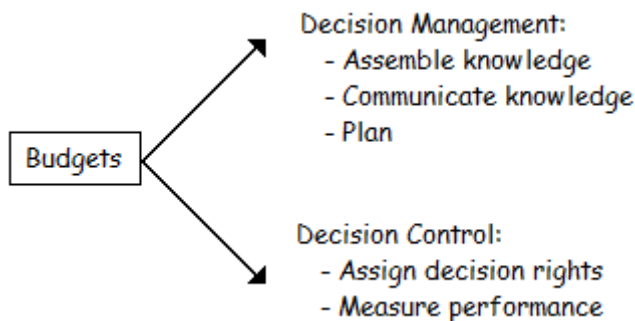
What role does the firm's internal accounting system play in resolving organizational problems?
 The internal accounting system is most useful in decision monitoring and is an important part of the separation of decision management and control. Accounting departments, being independent of operating management, are part of the firm's internal contracting system designed to reduce agency costs. Accounting reports are one measure of an agent's performance.

Is the choice of transfer pricing methods a zero-sum game?

No. Changing transfer pricing methods does more than shift income among divisions. The method used can change the profitability of the firm as a whole because the buying/selling divisions changes its scale of operations in response to the transfer price.

Chapter 6

Budgeting is used for decision making and to control conflicts of interest. Budgeting systems are part of the firm's accounting system. A *budget* is management's formal quantification of the operations of an organization for a future period.



Budgetary control can be described as involving the following:

- (1) The statement of the plans of all departments of the business for a certain period of time in the form of estimates.
- (2) The coordination of these estimates into a well-balanced program for the business as a whole.
- (3) The preparation of reports showing a comparison between the actual and the estimated performance, and the revision of the original plans when these reports show that such revision is necessary.

At the beginning of the operating year, the board of directors submits an operating budget to the general members for approval. This plan shows projected revenues / expenses. To prepare the

budget, management and the board examine each revenue and expense item for the previous year and adjust it for expected inflation and any change in operating plans.

An unfavorable budget variance occurs when actual expenses exceed budgeted expenses or when actual revenues are less than budgeted revenues. The operating statement merely identifies a budget variance. Additional analysis is required to identify its causes and any corrective action needed to solve the problem.

A variance is due to less sales or due to a manager who was less cost-conscious.

Budgeting can be a process by which knowledge is assembled:

- Vertically: From lower levels to higher levels in the organization, and vice versa.
- Horizontally: In the same level.

Many budgeting systems involve a bottom-up or top-down approach:

- *Bottom-up budgeting*: Those submitted by lower levels of the organization to higher levels and usually imply greater decision management.
- *Top-down budgeting*: The use of aggregate data (i.e. on sales trends) to forecast in this case sale for the entire firm. This budgeting improves greater decision control. Top management make the budget and pass this back down to the organization.
 - *Participative budgeting*: The person ultimately being held responsible for meeting the target makes the initial budget forecast.

In decision management, budgets serve to communicate specialized knowledge about one part of the organization to another part. In decision control, budgets are part of the performance measurement system. The budget becomes the benchmark against which to judge actual performance. If too much emphasis is placed on the budget as performance benchmark, then managers with specialized knowledge will stop disclosing unbiased forecasts of future events and will report conservative budget figures that enhance their performance measure.

Ratchet effect : Refers to basing next year's standard performance on this year's actual performance. However, performance targets are usually adjusted in only one direction, upwards. So if you meet this year's targets, next year's targets will be increased.

Favorable budget variances are more likely to lead to larger increases than unfavorable variances are to lead to decreases.

Why do firms ratchet up their budgets given the perverse incentives induced? One possible reason is that even more perverse incentives might arise if they don't. While the ratchet effect creates dysfunctional behavior, the alternatives might prove more costly.

Two different approaches are being proposed to improve the budgeting process:

- Method 1: Involves building the budget in two distinct steps.
 - Step 1: Construct budgets in operational, not financial terms.
 - Step 2: Develop a financial plan based on the operational plans developed in step 1.
- Method 2: Involves breaking the so-called 'annual performance trap'. Firms use relative performance targets of other units or firms and compare these peer-units' performance to the actual performance achieved by the unit being judged.

Different kind of budgets:

- *Long-run budgets*: Budgets that project 2, 5, and sometimes 10 years in advance. In long-term budgets, the key assumptions involve what markets to be in and what technologies to acquire. Long-run budgets contain future capital budgeting forecasts required to implement the strategy. Long-run budgets are primarily used for decision management.

- *Short-run budgets*: Budgets that project only one year at a time. In short-run budgets, the key assumption involves quantities and prices. Short-run budgets involves both decision management and decision control.
- *Rolling budgets*: Covers a fixed period. A future period is added as the current period concludes. When the current quarter is concluded, a new quarter (for example two years ahead) is added.
- *Line-item budgets*: Refers to budgets that authorize the manager to spend only up to the specified amount on each line item. Managers responsible for the line-item budgets cannot reduce spending on one item and divert the savings to items that enhance their own welfare.
 - Governments use encumbrance accounting in addition to line-item budgets. When contracts for purchases are signed or purchase order are issued, encumbrance accounting requires the dollar amounts of such goods and services to be recorder in special encumbrance accounts. When the goods and services are delivered, the encumbrance entry is reversed, and the purchase is charged to the appropriate line-item expenditure.

Strategic planning: Refers to the process whereby managers select the firm's overall objectives and the tactics to achieve them.

Budget lapsing: Unspent funds do not carry over to the next year. Budget lapsing creates incentives for managers to spend all their budget. Otherwise, not only managers lose the benefits from the unspent funds, but next year's budget may be reduced by the amount of the underspending.

Static budgets: Budgets which do not vary with volume.

Flexible budgets: Is a function of some volume measure and is adjusted for changes volume.

Should managers be held responsible for volume changes if the factors that cause volume changes are outside their control?

Managers should be held responsible for volume effects only if they have some control over it. If the manager's actions influence the effects of volume changes, then the managers should not be insulated from the volume effects.

When should a firm or department use a static budget and when should it use a flexible budget?

If the manager has some control over volume or the consequences of volume, then static budgets should be used as the benchmark to gauge performance. If the managers do not have any control over either volume or the consequences of volume, then flexible budgets should be used as the benchmark to gauge performance.

Incremental budgeting: Organizations construct next year's budget by starting with the current year's budget and adjusting each line item for expected price and volume changes. These incremental budgets are reviewed and changed at higher levels in the organization, but usually only the incremental changes are examined in detail. The core budget (i.e., last year's base budget) is taken as given.

Zero-based budgeting: Each line item in total must be justified and reviewed annually. Each line item is reset to zero annually and must be justified in total.

Chapter 7

Cost allocation: The assignment of indirect, common, or joint costs to different departments, processes, or products. Despite different organizational settings, all organizations face a similar

problem: allocating a set of costs to a *cost object*. A cost object is a product, process, department, or program that managers wish to cost.

Common costs (= indirect costs = overhead): Arises when a resource is shared by several users. They cannot be directly traced to units produced or cost objects precisely because such costs are incurred in providing benefits to several different cost objects.

Cost allocation (= cost assignment = cost apportionment = cost distribution): Describe the process of taking a given common cost and dividing it between various cost objects. Cost allocation requires the following steps.

- 1) *Define the cost objects.*
- 2) *Accumulate the common costs to be assigned to the cost objects.*
- 3) *Choose a method for allocating common costs (step 2) to the cost objects (step 1).*
An *allocation base*, a measure of activities associated with the pool of common costs being distributed to the cost objects, must be selected.

There are three (indirect) reasons that organizations allocate costs:

- 1) *External reporting (including taxes)*
External financial reports and tax accounting rules require that inventory be stated at cost, including indirect manufacturing costs. To avoid the extra bookkeeping costs of a second set of accounts that exclude the allocated costs, firms use the same accounts internally as externally. However, additional bookkeeping costs would likely be small and offset by the costs of dysfunctional decisions from using the external system for internal operating decisions.
- 2) *Cost-based reimbursements*
The producer's revenues are in part a function of reported costs. In firms whose revenues depend on reported costs, cost allocation can have a large impact on cash flows (example: electric and gas companies).
- 3) *Decision making and control*
Cost allocations are an important part of the organization's budget system (by which resources are allocated within the firm) and an important part of the organization's performance evaluation system. Cost allocations change the way decision rights are partitioned within the firm.

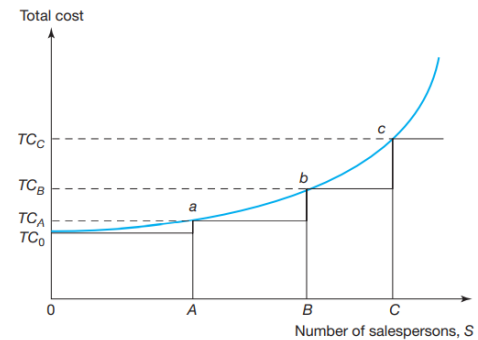
Cost allocation can affect real resource utilization and cash flows. Three (direct) organizational reasons for cost allocations:

- 1) *Cost allocations act as an internal tax system.* Like a tax system, they change behavior. Compared with no allocations, cost allocations:
 - Reduce the manager's reported profits.
 - Change the mix of factor inputs; less of the input taxed by the overhead is used, and more of the untaxed factor inputs are used.
- 2) *Factor price understates the total costs.* They 'ignore' externalities; costs or benefits imposed on other individuals without their participation in the decision and without compensation for the costs of benefits imposed on them. Externalities can be positive or negative. Cost allocation proxies for these hard-to-observe externalities.

Should human resource department costs be allocated back to the branch manager to tax the manager for the externality of degraded service in the human resource department caused by the branch manager's hiring an additional salesperson?

The allocation decision depends on the exact shape of the cost curve of the overhead department and where the firm is on the curve. It also depends on whether other inputs are allocated and the relation among inputs. There are three cases to consider:

1. $R_a = \frac{TC_A}{A} > MC_a$
2. $R_b = \frac{TC_B}{B} = MC_b$
3. $R_c = \frac{TC_C}{C} < MC_c$



The only guidance is to consider allocating whenever marginal cost is above the average cost; if marginal cost is below average cost, allocating may not be a good idea.

Marginal cost equals average cost when average cost is at a minimum (point b).

Marginal cost is above average cost when average cost is increasing (point c).

Marginal cost is below average cost when average cost is decreasing (point a).

Given these relations between average and marginal costs, the firm should consider allocating overhead when average cost is increasing, because in this case we also know that marginal cost is always above average costs. Hence, the decision to allocate or not does not require knowledge of marginal costs, but of whether the average cost is falling or rising as output expands.

3) *Insulating versus noninsulating cost allocations.*

Cost allocations affect the manager's welfare through either pecuniary or nonpecuniary rewards. If common costs are not allocated, the managers in two divisions have less incentive to invest in the specialized knowledge necessary to determine the optimum level of the common costs. If the decision rights over the common costs do not reside with the managers of the two divisions and the common costs are not allocated back to the two divisions, the division managers will always be demanding more common resources.

- *Insulating allocation:* The costs allocated to one division do not depend on the operating performance of the other division.
- *Noninsulating allocation:* The costs allocated to one division do depend on the operating performance of the other division.

To summarize:

- Common costs should be allocated for decision making and control whenever the marginal cost of a common resource, such as the human resource department, is equal to or greater than the resource's reported average cost.
- Common costs should be allocated using an allocation base that does not insulate subunits whenever interactions among the subunits are high and cooperating is important. If interaction is unimportant, an allocation base should be chosen that does not fluctuate with another subunits' performance.
- Noninsulating cost allocations can reduce the risk managers bear by diversifying that risk across other managers.

Chapter 8

One problem arising when significant amounts of fixed costs are allocated, and users have discretion over using the service being allocated involves the *death spiral*.

- The death spiral results when utilization of a common resource falls, creating excess capacity. Average (full) cost transfer pricing charges the users for the common resource. The fixed costs are borne by the remaining users who have incentive to reduce utilization, further raising the average cost and causing additional defections.
 - Notice that the death spiral can occur whenever full cost transfer pricing is used, there are significant fixed costs, and the user has some discretion over the quantity of the common resource to use.

Solutions to the death spiral:

- When excess capacity exists, users should be charged for only the variable cost of the resource. Alternatively, some of the fixed costs could be excluded for the transfer price.
- Use the *practical capacity* instead of actual utilization in calculating the overhead rate. Practical capacity represents the amount of capacity the common resource was expected to provide when it was purchased and used under normal operating circumstances. Practical capacity reduces the likelihood of the death spiral because the cost of unused capacity is not imposed on the remaining users of the common resource.

Allocating capacity costs: Depreciation

One way to solve the death spiral is to not allocate some (or all) of the fixed cost. For example, allocate only the fixed cost of the capacity actually being used. This solution creates concerns:

- In deciding whether to allocate depreciation on the common resource to its users, the firm makes a trade-off between the efficient investment in the common resource and its efficient utilization after acquisition. Charging depreciation helps control the overinvestment problem, but at the expense of underutilizing the asset after acquisition.

There three ways to allocate service department costs to the operating divisions. These three methods and their advantages and disadvantages are discussed next:

1. Direct allocation

Direct allocation ignores each service department's use of the other service departments. The service department costs are allocated directly to the operating divisions rather than to the other service departments first and then to the operating divisions.

Problems with direct allocation:

- The opportunity cost per unit of service is likely wrong. The direct allocation method excludes the service department's use of other service departments and therefore incorrectly states the opportunity cost of each service department. Therefore, each service department will overuse the other service departments.

2. Step-down allocation

The procedure begins by choosing a service department and allocating all of its costs to the remaining service departments and operating divisions. Then, a second service department is chosen, and all of its cost are allocated to the remaining service departments and operating divisions. This process continues until all service department costs are allocated. In this way, all service department costs cascade down through the service organizations and eventually are allocated to the operating divisions.

One criticism of the step-down method is that the sequence used is arbitrary and large differences can result in the cost per unit of service using different sequences. Also, the step-down method ignores the fact that although departments earlier in the sequence use service departments later in the sequence, earlier departments are not allocated these costs.

How to choose the order of the allocation?

1. Most reliable cause and effect cost driver
2. Number of other departments serviced
3. Total budget of the department

The death spiral can be a problem with the step-down allocations if the service departments contain significant amounts of fixed costs. If transfer prices are established for these service department costs, then users have incentives to use less of the high-cost service departments. As usage falls, total costs do not fall proportionately because of the fixed costs. This causes the costs allocated to the remaining users to rise further, these users will seek to replace the inside service with outside vendors that offer lower costs.

3. Reciprocal allocation

Under the reciprocal allocation method, a system of linear equations is constructed, one for each service department. Each equation contains the use of that department by all other service departments. The reciprocal allocation method is more accurate in assessing the opportunity cost of service departments than either the direct or step-down allocations, assuming all service department costs are variable. So, it's the most accurate method. We completely acknowledge all the costing relationships that we could see.

The reciprocal method produces a transfer price that can be compared with an outside price for the service. If the outside bid is less than the internal price, it should be accepted. This assumes that the inside costs of service represent all variable cost. If any of these costs contain fixed costs and there is excess capacity, then the reciprocal method does not produce opportunity cost transfer prices.

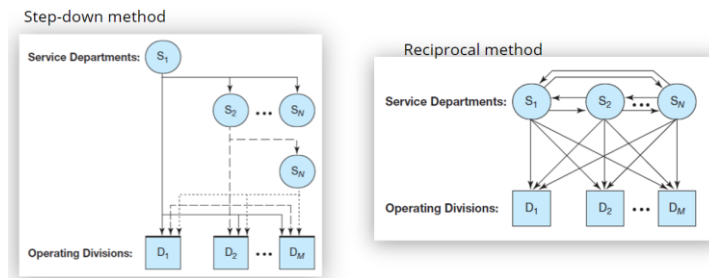
To take full advantage of the reciprocal method's ability to estimate opportunity cost transfer prices, only the variable costs in each service department should be allocated using the system of equations. The fixed costs in each service department are either not allocated or allocated based on each operating division's planned use of the service department's capacity.

Because the cost per product varies depending on which allocation method is used, the cost allocation scheme affects the decision of each department to add the product.

The transfer prices can vary a great deal even when the cost allocation methods have little effect on the total amounts allocated. The large variation in the cost-based transfer prices arises because the transfer prices in this setting are ratios.

- 1) The denominator of the ratio is the number of units in the remaining allocation base.
- 2) The numerator of the ratio is the sum of the department's direct costs and any costs allocated to the service department.

Critical assumption underlying all three allocation methods is that the utilization rates do not change with increases or decreases in scale.



Recap: There are three reasons to allocate service department costs:

- 1) By charging a positive 'price', users reduce their consumption from what it would be under a zero price (no cost allocation). Pricing the internal service helps allocate a scarce resource. At a zero price, demand usually exceeds supply. In the absence of a price mechanism to allocate department services, senior management will be confronted with requests to increase the amount of service via larger budgets and must devise nonprice priority schemes to manage the demand for service.
- 2) By allocating service department costs, senior management receives information about the total demand for the service at the allocated cost. This helps management to determine the optimum scale of the service department. For example, if the users are willing to pay a transfer price that recovers the cost of providing the service, then the service department is providing benefits to the users in excess of its costs.
- 3) By comparing the internal allocated cost with the outside external price of comparable services, senior management can assess the service department's operating efficiency. Gross inefficiencies are identified when the allocated cost per unit of service exceeds the external price.

Joint cost is incurred to produce two or more outputs from the same input. Joint products are produced from a single input.

Joint costs ≠ *Common costs*

- *Joint costs*: Are incurred in only disassembly processes.
- *Common costs*: Are incurred in both assembly and disassembly processes.
 - *Assembly process*: Many inputs are assembled into a few final outputs.
 - *Disassembly process*: A few outputs are disassembled into many final products.

Three methods for allocating joint costs:

- Physical measures (weight, volume, relative sales value, etc.)
- Relative sales value method (Selling prices are used that need to be recorded: frequent changes in sales price introduce variability into the allocated costs)
- Net realizable value method

The fundamental point to remember when analyzing situations involving joint costs is that any joint cost allocated to final products is meaningless for assessing product-line profitability.

The *net realizable value* method of allocating joint costs uses as the allocation base the difference between sales revenues and the additional costs (beyond the joint costs) required to process the product from the point at which the joint products are split off until they are sold. When analyzing situations involving joint costs, the fundamental point to remember is that *joint cost allocations can cause a death spiral*.

The advantage of NRV is that it does not distort the relative profitability of product-line costs. Products with the greatest contribution margins beyond the split-off point bear more of the joint cost. Another

advantage is that it is better for decision making. NRV allocation does not provide any additional information for decision making beyond whatever information is already contained in the NRV from further processing. That is, if a product is contributing positive cash flows beyond the split-off point, allocating joint costs using NRV is also irrelevant for product line profitability analysis. The disadvantage of NRV is that it is costly to collect selling prices and costs beyond the split-off point. It is important to emphasize that when net realizable value is calculated, the costs beyond the split-off point must include only the direct costs associated with processing the joint product further. If no further processing is performed, then the firm should save all the costs beyond the split-off point. If costs beyond split-off point contain any allocated fixed common costs, the decision to stop processing will not save the fixed common costs.

By products: Joint products that have small commercial value or are not the primary products of the joint production process.

Managers producing joint products must make two different, but interrelated decisions:

1) *Which joint products to further process (and what prices to charge for them)?*

A joint product should be further processed if its final sales price exceeds the additional processing cost plus its unprocessed sales value.

2) *Whether to process any joint inputs (and how many)?*

Continue processing joint inputs as long as the sum of the joint product's NRVs exceeds all the costs up to and including the split-off point.

Because of segment reporting it happens that there is a segment with a negative controllable segment margin. It appears this division should be dropped, should it? Not necessarily! Dropping either product adversely affects the demand for the other. The accounting segment report does not capture these interdependencies in demand.

Chapter 9

Five reasons why firms allocate cost:

- Decision management
- Decision control
- Cost-plus pricing contracts
- Financial reporting
- Taxes

Absorption cost systems: Ensure that all manufacturing costs are directly traced or allocated to the various products made. Absorption cost systems are widely used in financial reporting for calculating the book value of inventory and cost of goods manufactured.

- Nonmanufacturing accounting systems are simpler in that they do not have work-in-process and finished goods inventories. On the other hand, defining the 'product' to which costs are allocated is often more difficult.

There are different types of manufacturing processes:

- 1) *Job shop:* Customized production to a customer's specification.
- 2) *Batch manufacturing:* Standardized products manufactured in batches of given lot sizes either to meet customer orders or for inventory.
- 3) *Assembly processes:* Finished parts and subassemblies assembled into a finished product.
- 4) *Continuous flow processing lines:* Such as oil refineries and chemical processing plants.

Two types of absorption systems:

- *Job order costing*: The cost of each job is tracked separately, and job order cost systems accumulate costs by jobs.
- *Process cost systems*: Costs are assigned to the production processes and ultimately to the products flowing through the various processes.

With either system, all manufacturing costs are assigned to the products produced.

Several important features of job order costing:

- The items being produced by the job are the objects being costed.
- All direct costs of manufacturing the job are traced directly to the job.
- Each job is charged for some indirect manufacturing overhead.
- An input measure, machine hours, is used to allocate overhead costs to jobs. An input measure is the allocation base.
- The overhead rate per input measure is set at the beginning of the year, before the first jobs are started. This overhead rate is the ratio of expected factory overhead for the year divided by the expected machine hours for the year.
- Reported product costs are average rather than variable or marginal costs. Each job is assigned a portion of the overhead. Since overhead contains both variable and fixed costs, overhead distributed to jobs contains some fixed costs.

The accounting system tracks the costs charged to each job by posting them to ledger accounts (T-accounts) via the usual mechanics of double-entry bookkeeping. When a job is finished and transferred to finished goods inventory, the total job cost from the job order cost sheet is transferred out of the work-in-process T-account and into the finished goods T-accounts. Similarly, when the goods are sold, the dollars flow out of the finished goods T-account and into the cost-of-goods-sold T-account. Management must decide which inventory flow assumption to use in making the transfers between the various T-accounts (LIFO / FIFO / specific identification). This choice is important because it affects taxes, financial statements, internal decision making, and control.

Overhead rates:

Four points of overhead rates are worth noting:

- 1) The overhead rate equals annual budgeted overhead divided by budgeted volume. This measure averages out seasonal variability in monthly expenditures and volume. Each completed job can be costed, even though the total overhead and actual volume for the year are not known. A *prospective* overhead rate, set at the beginning of the year, allows jobs to be costed as they are produced.
- 2) Budgeted volume is measured using an input instead of output. Inputs are used to measure volume because most plants produce heterogeneous products. Typical volume measures are direct labor hours, direct labor dollars, direct material dollars, and machine hours.
- 3) The measure of volume chosen as the allocation base is usually the one that has the greatest association or cause-and-effect relation with overhead.
- 4) The choice of the overhead volume measure is critical; because it is the taxed input, managers will seek to reduce its use.

If the overhead rate is less than or equal to the marginal cost imposed on the firm when output expands by one more unit, allocating overhead is better than not allocating it.

Overabsorbed overhead: Actual overhead incurred – Total overhead absorbed < 0.

Underabsorbed overhead: Actual overhead incurred – Total overhead absorbed > 0.

There are three ways of disposing of the over/underabsorbed balance at year end:

- 1) Write it off to cost of goods sold.

- Overabsorbed: Cost of goods sold reduces; income rises.
 - Underabsorbed: Cost of goods sold increases; income falls.
- 2) Allocate it among work-in-process, finished goods and cost-of-goods-sold T-accounts based on the amount of overhead in these categories.
 - 3) Recalculate the cost of each job using actual overhead incurred and actual volume to compute a revised, end-of-year overhead rate.

One way to forecast the overhead rate is to use a flexible budget. The first step requires estimating budgeted annual overhead. The second step involves calculating the budgeted annual overhead rate.

1. Budgeted annual overhead = Fixed overhead + Variable overhead.
= FOH + VOH x BV.
2. Budgeted overhead rate = Budgeted annual overhead / Budgeted volume.

Budgeted volume can be determined in two ways:

- *Expected volume*: BV can be estimated as the volume expected for the coming year.
- *Normal volume*: BV can be estimated as the long-run average volume. To avoid incorrect pricing decisions, managers should be wary of altering overhead rates due to short-run fluctuations in volume. To calculate an overhead rate that does not fluctuate with volume, use normal volume as allocation base.

Senior managers might not want to use normal volume and may not want to have over/underabsorbed overhead charged to cost of goods sold. Managers responsible for managing the overhead have less incentive to control it if over/underabsorbed overhead is not charged to product costs. Overhead tends to grow over time and is difficult to control. When overhead rates vary with expected volume, managers responsible for specific overhead items often encounter pressure to reduce overhead growth. Using normal volume, managers have more discretion in managing earnings because setting normal volume is more subjective than setting expected volume.

The choice between using normal volume or expected volume for calculating overhead rates depends on whether decision management or decision control is the primary concern.

- Using normal volume enhances decision management.
- Using expected volume enhances decision control.

Temporary changes in volume are assumed to average out over the business cycle, and no asset write-offs or other accounting changes are necessary. However, to prevent dysfunctional pricing decisions, fixed asset write-offs can accompany permanent declines in volume, thereby preventing overhead rates and hence unit costs from rising.

There are three ways methods of allocating overhead costs:

1. *Plantwide overhead rate*: All of the overhead costs are first accumulated in a single overhead account or cost pool, a collection of accounts accumulated for the purpose of allocating the costs in the pool to activities, products, or processes, and then allocated to products using a single plantwide overhead rate.
2. *Multiple overhead rate*: Each component of overhead is treated as a separate cost pool.
3. *Departmental overhead rate*: Each department is treated as a separate cost pool. Separate allocation bases are developed for each department, and then overhead costs are allocated to products.

Whether managers use a single plantwide overhead rate, multiple rates or departmental rates depends on the organization, the incentive systems in place, management's demand for accurate cost data for decision making, and the incremental cost of using more complex cost systems.

- A plantwide rate is acceptable if the plant has a single homogeneous production process.

- If overhead rates contain large amounts of fixed historical costs, then neither plantwide rates nor individual department rates accurately reflect the opportunity cost of the capacity.
- If the plant is organized into production departments, separate departmental overhead rates usually are more useful for performance evaluation purposes.

It is often implicitly assumed that multiple overhead rates for different classes of overhead costs are more accurate estimates of product costs than a single plantwide overhead rate. Using multiple overhead rates requires that each overhead item be analyzed and that the volume measure most closely associated with the variation in the overhead cost item be used as the allocation base. That is, the *cost driver* for each overhead category must be identified.

If the production process does not have jobs, how are costs accumulated?

In such continuous flow production processes, all costs are averaged via an allocation process. *Process costing* is an extreme case of averaging. Since the production process is a continuous flow operation, discrete jobs do not exist. In process costing, costs are assigned to identical products that undergo a series of manufacturing processes in a continuous flow.

Process costing is inherently simpler and less costly to maintain than job order costing because one does not have to account for separate jobs. On the other hand, the information provided is far more aggregate and other less useful for decision making.

Chapter 10

Cost systems serve numerous functions, including decision making, control and external reporting. No single system can satisfy all the requirements of each function, so trade-offs must be made. Costing systems are constantly being revised and updated as technology and firms' organizational architecture change.

Absorption cost systems are designed to absorb all manufacturing costs into product cost. Some complaints about these systems arise from their full absorption character. In particular, it is claimed that absorption cost systems create incentives to overproduce.

- Overproduction: The firm produces more units because it causes profit to rise. The reason that profit rises; fixed costs are spread out over more units (even these units are inventory).
- Variable cost per unit remains constant as production is increased. If marginal cost (and hence variable cost) per unit rises as production increased, then average unit costs can actually increase. An increasing marginal cost reduces the incentives of managers to overproduce with absorption costing.
 - $\text{Fixed costs absorbed to units sold} = (\text{Fixed costs} / \text{Units produced}) \times \text{Units sold}.$

There are several ways to mitigate the incentive to overproduce:

- 1) Charge inventory holding costs against profits. That is, inventory values are increased by the cost of capital plus warehousing costs.
- 2) A strict senior management policy against building inventories. Compensation plans can contain a clause that bonuses tied to net income will not be paid if inventories exceed a certain amount.
- 3) Compensation can be based on stock prices instead of on accounting earnings, which removes the incentive for managers to overproduce.

- 4) Use just-in-time production systems to reduce the inventory levels. In a just-in-time system, manufacturing does not begin until the part of final product is ordered by a customer.

Variable costing (= *direct costing*) is claimed to eliminate the incentive to build inventories. The difference between absorption costing and variable costing is in the treatment of fixed costs:

- Absorption costing: Fixed manufacturing costs are included as part of product costs.
- Variable costing: Fixed manufacturing costs are written off as period expenses (and not included in product costs).

The purported advantages of variable costing are that it eliminates distortions to income and product costs when volume changes, and it reduces the dysfunctional incentives to overproduce.

- When production and sales are equal, absorption costing and variable costing give identical profit amounts (assuming no beginning inventories). When production and sales are equal, both costing methods write off all fixed costs to income.
- Absorption cost net income is higher in year 2 than in year 1 because some of the fixed costs in year 2 end up in inventory. In contrast, variable cost net income is constant over the two years.

Proponents claim that variable costing eliminates the incentives of managers to show higher profits by overproducing. However, this claim is not entirely accurate. It depends on how the budget variance is treated:

- When the budget variance is treated as fixed costs, there is no extra profit.
- When the budget variance is treated as variable cost, there is an extra profit.

If each component of overhead is separately classified as fixed or variable, then at the end of the year management has no discretion to classify the over or under absorbed overhead as either fixed or variable.

The principal benefit of variable costing is it eliminates (or reduces) the incentive to overproduce as a way to boost reported earnings. But there are potential problems with variable costing:

- *How does one determine which costs are fixed and which costs are variable at the end of the year?* By classifying all of the excess overhead costs as variable, managers using variable costing can inventory some of these extra costs by overproducing. Therefore, even under variable costing, building inventories can result in higher reported profits whenever actual overhead exceeds the flexible budget amount.
- Another problem with variable costing is that it produces misleading unit cost figures. The opportunity cost of manufacturing a given product includes the direct costs and the forgone opportunities of using the plant and equipment in other ways. If variable costing is used, unit cost figures do not contain any amount for the opportunity cost of the production capacity.

Both full and variable costing rely on historical costs. If the firm expands or contracts into areas of its cost curve where it has not been before, there is no historical information regarding the level of costs in these unexplored regions.

Not only are unit costs not actual costs; they are not marginal costs. Although stated in terms of dollars per unit, unit costs do not tell us the cost of producing one more unit.

Chapter 11

One problem with some cost accounting systems is that they track historical costs instead of tracking the physical activities that consume resources and generate costs.

Many costs in a plant are driven not so much by the number of units produced as by the number of transactions, such as machine setups, purchase orders, or shipments. Allocating these transaction-based costs using unit volume causes products with large production volumes to be assigned too large a share of these costs.

When managers and accountants speak of inaccurate product costs, they mean that overhead costs are not being tracked to the activities causing the costs. Rather, these costs are being combined with other cost pools and these overly aggregated pools are then being allocated to products using allocation bases that do not capture the cause-and-effect relation driving the particular costs in the overly aggregated cost pool.

Traditional absorption systems can be modified to provide more accurate product costs. The important point is that managers seeking to control costs must manage the cost drivers. Controlling costs requires identifying and managing the key factors that generate costs, not massaging the cost number or cost allocation procedures.

Complex products are usually undercosted by absorption cost systems because the factors that cause one product to be more complex than another are not used to allocate overhead. Unless the more complex products use proportionately more direct labor than less complex products, then too little overhead is allocated to the more complex products.

Activity-based cost (ABC) system

An ABC system is one such modification. ABC systems are intended to provide more accurate product costs and to give managers the data to manage the cost drivers. It recognizes that overhead costs vary not only with volume but also with the range of items manufactured – that is, the diversity and complexity.

Installing an ABC system begins with an analysis of the types of transactions that generate costs in each factory support department. Cost analysts examine each factory department to understand what drives the costs in that support department. Once the cost driver is determined, it can be classified into one of the four mutually exclusive categories:

- 1) *Unit-level costs*: Arise from activities that are performed at least once for each unit of product.
- 2) *Batch-level costs (BC)*: Arise from activities performed once for each batch (B) or lot of products. It depends on the number of batches rather than the number of units in each batch.
- 3) *Product-level costs (PL)*: Arise from activities to support the production of the product type or model. It depends on the existence of the product line (L) and do not vary with the number of units or number of batches produced.
- 4) *Capacity-sustaining costs (OC)*: Arise from all remaining activities required for the overall productive capacity of the factory. It depends on all the products produced and do not depend on the number of units, batched, or product lines produced.

When each cost is segregated into one these four categories, the factory is broken up into distinct sets of activities, or identifiable operations that consume resources. Costs are accumulated by activity centers. Cost drivers should accurately reflect the underlying factors that cause a particular overhead activity's costs to vary.

The formula for the ABC system:

$$TC = (VC \times Q) + (BC \times B) + (PC \times L) + OC$$

Assumptions that potentially reduce its accuracy:

- Every batch is assumed to cost \$BC regardless of the number of units in the batch, the types of products in the batch, and what was produced before the current batch.
- Each product line is assumed to cost \$PC regardless of the complexity of the lines.

Difference between absorption costing and ABC costing:

- *Absorption costing*: Traditional unit-based costing overcosts the high-volume models and undercosts the low-volume models.
- *ABC costing*: Unit-level allocation bases overcost the less complex products and undercosts the more complex, more resource-consuming products.

Activity-based costing systems claim to offer several advantages:

- ABC increases the percentage of product costs directly traced to individual products.
- ABC provides an understanding of how costs are consumed by individual products, the activities required to produce them, the direct and indirect costs in the various activity centers, and how indirect costs are generated by cost drivers.
- ABC focus costs control at the activity level and the product design level. Managers focus attention on controlling costs in the activity center and reducing the content of the cost driver in the products.

ABC systems are directed primarily at decision management, not decision control. Once the cost system has been converted to ABC, managers presumably have more accurate product cost information to make pricing decisions and to improve operating efficiencies. *Activity-based management* (ABM) is a process whereby business activities are identified and evaluated for potential streamlining or elimination.

Benefits and Costs of ABC:

Most proponents argue that activity-based costing provides more accurate product cost data for decision making. A central tenet of activity-based costing is that more accurate product costs are always preferable to less accurate product costs and that accuracy generally increases with the number of cost drivers. Increasing the number of cost drivers means giving more discretion over the cost system to the managers whose performance is being measured by these systems.

The cost if ABC systems include both the direct costs of collecting and reporting data on the activity levels and the costs incurred from the loss of control arising from less effective monitoring of managers because these managers have more discretion in choosing the cost drivers.

ABC measures costs, not benefits

Although ABC systems capture how different products consume resources, they are unable to capture the joint benefits of having multiple products. Multiple products can yield joint benefits from the demand or supply side. ABC ignores these benefits by focusing on allocating costs. An even if these joint benefits are identified, they cannot be allocated meaningfully.

Acceptance of ABC

Several problems exist in implementing ABC:

- The high cost to maintain the ABC model has caused many firms to update the information infrequently, leading to out-of-date activity cost driver rates and inaccurate estimates of product and customer costs.

- A second problem involves the complexity of many ABC systems. To generate accurate ABC cost estimates, more cost drivers are added to capture the underlying complexity of the various processes performed by the firm.
- The third problem encountered in ABC is the increased ability of employees and managers to game the numbers. ABC requires people to estimate how they spend their time and identify specific cost drivers. These are inherently subjective estimates that are difficult to verify objectively and can lead to inaccurate estimates of activity-based costs.

Few calls for activity-based costing are based on decision control reasons:

- 1) Proponents of activity-based costing are operating managers who want better information for decision making.
- 2) Most ABC systems are stand-alone off-line systems. Firms are reluctant to change accounting systems, which are primarily for decision control.
- 3) Most of the resistance to ABC comes from corporate management and the accounting staff. ABC systems tend to sacrifice decision control for decision management, thereby reducing the usefulness of accounting numbers for decision control.

Chapter 12

Standard costs are benchmarks: They represent the expected or desired future cost of a product, process, or subcomponent. Once standards are set, managers can gauge performance by comparing actual operating results against the standards. The amount by which actual and standard cost differ is the standard cost *variance*.

Standard cost is the expected cost that is reasonably required to achieve a given objective under specified conditions. They arise from the budgeting process.

Standard costs and variance are used for several reasons:

- To provide a basis for performance evaluation system.
- To provide info to other managers in the firm regarding the normal or expected (opportunity) costs of producing a repetitive activity, part, or product.
- To provide info to senior managers regarding whether the system is in control or not.
- For product pricing.

Setting and revising standards:

- *Standard material cost:* standard quantity x standard price.
 - Standard costs are estimated in manufacturing by taking the list of all the materials required for the product and forecast how much of each material is required for the product and the expected price for each material.
- *Standard labor cost:* expected labor x expected wages.
 - Routing sheets contain information about how much labor times is required in each department to produce each product.

One reason for biasing the standard cost downward is to exert more pressure on managers to eliminate waste and other operating inefficiencies. One reason for biasing the standard cost upward is in order to prevent setting selling prices too low.

The choice of tight versus loose standards often involves trading off decision control (tight standards) for decision management (loose standards). Decision management requires assembling the specialized knowledge that often resides only with the person or unit of the firm that later will be judged by the standard (decision control).

Most firms are very reluctant to change standards during the year. Once a standard is set at the beginning of the year, it is rarely revised during the year. The only exception to this practice occurs when there is a large, unexpected change in a standard. If standards are revised frequently during the year, operating managers have less incentive to control costs.

Target costing:

Is a top-down approach conducted during a new product planning. It starts with the long-run price (often estimated by the marketing department) required to achieve a desired market share. From this price, the required return on investment is subtracted to derive a total target product cost.

$$\text{Target cost} = \text{Target price} - \text{Target profit.}$$

This total target is then broken down into subcomponent costs, including selling and distribution costs. These subcomponent costs become the targets or standards to be achieved if the firm is to meet its goals from market penetration and return on capital. Target costing focuses management's attention on cost control during the critical design stage when most costs are controllable.

Three sets of standard cost variances:

- 1) Direct labor variances
- 2) Direct material variances
- 3) Overhead variances

Direct labor variance → Actual cost of labor – Standard cost of labor.

$$= (W_a H_a) - (W_s H_s)$$

$$= (W_a - W_s) \times H_a + (H_a - H_s) \times W_s$$

$$= \text{Wage variance} + \text{Efficiency variance.}$$

An accounting variance can indicate that either the operating unit deviated from the prescribed standard or that faulty assumptions were used to develop the standard. In the first case, supervisors of the direct labor did not operate at the levels assumed in the standards. In the second case, the standards were set at a level that could not be attained.

The extent to which wage and efficiency variances are used to measure performance and the weight they receive in a manager's performance evaluation depend on three things:

- 1) The reliability of the underlying standards.
- 2) The inherent variability of the wages and hours due to random fluctuations.
- 3) How much of the variance is potentially controllable by the manager?

Direct materials variance → Actual cost of material – Standard cost of material.

$$= (P_a Q_a) - (P_s Q_s)$$

$$= (P_a - P_s) \times Q_a + (Q_a - Q_s) \times P_s$$

$$= \text{Price variance} + \text{Quantity variance.}$$

Actually, there are three forms of quantity:

- Q_a = the actual quantity used in production.
- Q_s = the standard quantity used in production.
- Q_b = the actual quantity bought.

Direct materials variance (materials purchased and used later):

- Price variance + Quantity variance + Raw materials inventory
 - Price variance: $(P_a - P_s) \times Q_b$
 - Quantity variance: $(Q_a - Q_s) \times P_s$
 - Raw materials inventory: $(Q_b - Q_a) \times P_s$

Standard cost systems provide a mechanism inside the firm to reduce certain risks managers bear because their compensation is linked to accounting-based performance measures. Standard costs remove some uncontrollable factors from the performance measures of downstream users. Standard cost variances create subtle incentive effects:

- *The incentive to build inventories*: One way to generate favorable price variances is to purchase raw materials in lots larger than necessary for immediate production and hold these inventories until they are needed.
- *Externalities*: Purchasing managers can impose externalities on production by requesting materials be purchased on short lead times and in small lot sizes to reduce the quantity of materials in storage.
- *Discouraging cooperation*: Evaluating individuals within an organization based on variances can discourage cooperative effort.
- *Mutual monitoring*: Mutual monitoring means that managers or employees at the same level monitor each other.
- *Satisficing*: If the manager works sufficiently hard to achieve the standard, a bonus is often paid to the manager. The problem with this type of reward system is that managers have incentives to achieve the standard, but they have no incentive to go further.

Three options for disposing of the labor and materials variances:

- 1) Writing off to the cost of goods sold or income.
- 2) Allocating it among work in process, finished goods, and cost of sales.
- 3) Recalculating the cost of each job.

Why are variances usually written off to cost of goods sold? There are two reasons:

- 1) Prorating the variances creates incentives for managers to manipulate reported income.
- 2) Prorating the variances back to inventories will change the product costs incurred by the manager responsible for selling these inventories. The first reaction will be to change prices, an action he or she should not take. Of course, marginal costs can and do change, and standards must be updated to correctly reflect any changes.

Standard cost systems are expensive in terms of the opportunity cost of a manager's time to investigate cost variances and to oversee the development and maintenance of the standards. The benefit of standard costs comes from the development of specialized knowledge created by the manager in his or her investigations.

To maximize firms' profits, bottleneck should be scheduled to maximize the contribution margin per unit of scarce resource. Keeping non-bottlenecks operating at capacity does not increase throughput of the bottleneck and can actually decrease it if the excess inventory waiting to be processed clogs up the smooth flow of the high-contribution-margin units at the bottleneck.

Overview of skills

- Make and assess calculations on the basis of ‘opportunity costs’
- Describe, explain, and critically reflect on the association between management accounting, organizational economics and business administration
- Distinguish between various categories of control
- Describe, design and evaluate modern forms of performance management (e.g., balanced scorecards)
- Describe and explain the how and why of cost allocation
- Apply responsibility accounting, budgeting and transfer pricing to real-life cases and to reflect on such applications

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