

An ABC system may therefore contribute considerably towards addressing the company's current problems – but only when overhead costs are a large proportion of total costs and are not driven by direct cost activities.

2.4 Time-driven activity-based costing (TDABC)

Despite the advantages of ABC for firms experiencing problems with their conventional costing systems, adoption rates for ABC have historically been low (around 20%). Research has shown that typical reasons for the low adoption rate are as follows:

- Implementation of an ABC system is time-consuming and costly.
- Data is subjective and difficult to validate.
- Data is expensive to store and process, and reporting can be delayed due to complexities.
- Most ABC systems do not cover all the costs and activities of an organisation and therefore do not provide a complete view of profitability or profit opportunities. For example, administration costs and marketing costs may be excluded from an ABC system, even though they could be a large proportion of total costs.
- Updating the ABC system to meet changing needs and circumstances is difficult and costly.
- Whenever an ABC system ignores unused capacity, the reported costs may be misleading.

To overcome these difficulties with ABC systems, time-driven ABC (TDABC) was developed. Instead of identifying activities, drivers and cost pools for each individual activity, TDABC takes a departmental approach.

Consider the following example.



Example: TDABC

The customer service department of Lim Manufacturing performs the following activities and incurs the associated costs in a three-month period:

Activity	Time spent %	Assigned cost \$	Cost driver quantity	Cost driver rate \$
Process customer orders	70	396,900	49,000	8.10 per order
Handle customer enquiries	10	56,700	1,400	40.50 per enquiry
Perform credit check	20	113,400	2,500	45.36 per credit check
Total	<u>100</u>	<u>567,000</u>		

For the data above, the percentage of time spent is obtained from employee estimates of the average time they spend performing each activity. This is one of the cited disadvantages of ABC (see above). For example as a result, a customer enquiry is charged at \$40.50 whether it takes 10 minutes to resolve or one hour.

To overcome this, Lim Manufacturing have decided to implement TDABC. To do this only two items of data are required – the cost of the capacity supplied and the practical capacity of the resource supplied. The cost of the capacity supplied in the three-month period is \$567,000 (see above). To determine the capacity of the customer service department for the period, it is necessary to determine how much time is spent working by all employees. Lim Manufacturing determines that each employee works on average 7.5 hours per day and for 20 days each month, hence each employee will work for around 450 hours in each three-month period. To be more precise this can be converted to minutes by multiplying by 60 – 27,000 minutes. Not all this time is spent working however. Employees are entitled to 75 minutes each day for breaks, training and education. This brings the practical capacity of one employee to around 22,500 minutes in each three-month

period. As the customer service department employs 28 employees, its practical capacity in the period is 630,000 minutes (22,500 minutes × 28 employees).

It is now possible to calculate the capacity cost rate:

$$\begin{aligned}\text{Capacity cost rate} &= \frac{\text{Cost of capacity supplied}}{\text{Practical capacity of resource supplied}} \\ &= \frac{\$567,000}{630,000 \text{ minutes}} = \$0.90 \text{ per minute}\end{aligned}$$

To obtain a TDABC cost driver rate, employees need to estimate the time taken to perform each activity rather than the percentage of their time taken performing each activity. Employees at Lim Manufacturing provide the following estimates of their time:

Processing customer orders – 8 minutes
Handling customer enquiries – 44 minutes
Performing credit checks – 50 minutes

It is now possible to calculate TDABC cost driver rates for the three activities in the customer service department.

Activity	TDABC cost driver	
	Unit time Minutes	Rate (@\$0.90 per minute) \$
Process customer order	8	7.20
Handle customer enquiry	44	39.60
Perform credit check	50	45.00

Using a TDABC cost driver rate makes reporting at the end of each period more timely, because all that is required is the quantity of each activity performed for the period and the cost driver rate. In addition, it can reveal the extent and cost of unused capacity.

Customer service department end of period TDABC report

Activity	Quantity	Unit time	Total time	Unit cost \$	Total assigned cost \$
Process customer orders	49,000	8	392,000	7.20	352,800
Handle customer enquiries	1,400	44	61,600	39.60	55,440
Perform credit checks	2,500	50	125,000	45.00	112,500
Used capacity			578,600		520,740
Unused capacity (8.2%)			51,400		46,260
Total			<u>630,000</u>		<u>567,000</u>

The end of period TDABC reports reveals an under-allocation of costs for the customer service department of \$46,260. Traditional ABC period end reporting, with its reliance on percentage estimates, hides the existence and costs of unused capacity. In addition, the TDABC report can provide insights into the future. By revealing the amount and cost of unused capacity, management can make resource allocation decisions and plan for the future. In addition, the TDABC model is also easier to update as changes occur, as the time taken to perform activities need only be updated rather than the traditional ABC model which would require an entire estimate of percentages to be performed.

2.5 Advantages of time-driven activity-based costing (TDABC)

In summary, TDABC provides the following advantages over traditional ABC:

- (a) It is easier and faster to build an accurate cost model.
- (b) It integrates well with existing ERP and customer relationship management systems.
- (c) It drives costs to transactions and orders using time as the cost-accumulating feature of performing activities.
- (d) It can be run monthly to ensure timely reporting and management. It shows the extent and cost of capacity utilisation.
- (e) It allows budgeting of resource capacity on the basis of expected order quantities as well as order complexity.
- (f) It can be applied to all activities within the organisation, with the use of software and database technologies.
- (g) It enables fast and inexpensive maintenance of the TDABC system.
- (h) It supplies information to allow users to identify the factors that cause resource problems.
- (i) It can be used in any industry and with any level of complexity with regard to customers, products, channels, segments and processes.

3 Cost-volume-profit (CVP) analysis



Topic highlights

You should be familiar with CVP analysis from your previous studies, but it is a useful technique that may feature in your examination, and you should be prepared to use it if required.

Cost-volume-profit analysis (CVP analysis) is the analysis of how costs and profits change with increases or decreases in sales volume. It is based on simple marginal costing principles, which are that:

- For every unit of product sold, there is a variable cost of production and sale per unit, and this is usually a constant amount per unit. Similarly for every \$1 of items sold, the variable cost of sale is a fixed percentage amount of revenue.
- During a given time period, there is an amount of fixed costs. Fixed costs are unaffected by the volume of production and sales in the period.

3.1 CVP formulae

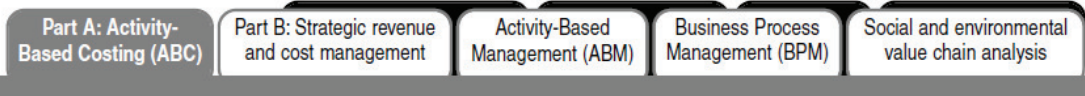


Topic highlights

This is a simple set of rules for CVP analysis. The relationship between revenues, costs, profit and sales volume can be set out in the following formulae.

Recognises that different activities drive (create) costs.

Cost per unit is more accurate, as different cost drivers are more realistic than assuming that costs are just driven by volume.



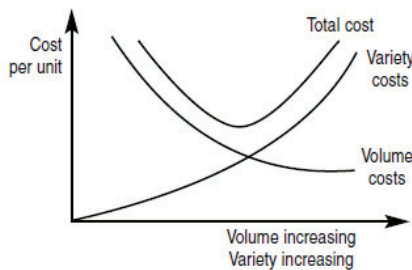
Volume versus variety

It can be easier to produce a small number of products in volume compared with producing a large variety of products in small runs.

The modern philosophy of manufacturing in variety leads to an increase in the costs of support services.

Cost control requires that costs of support activities are related to products via their causal factors.

The ABC approach is to relate the cost of support activities to cost drivers.



Volume costs are falling due to economies of scale.

Cost analysis in the modern business environment

- Short-term variable costs that vary with production volume.
- Long-term variable costs (often costs of support activities) that vary according to the range and complexity of production.

Cost drivers

Any factor which causes a change in the cost of an activity.

ABC and decision-making

ABC can assist with strategic decisions such as:

- Pricing strategy.
- Make or buy decisions.
- Promoting or discontinuing products or parts of the business.
- Developing and designing products.

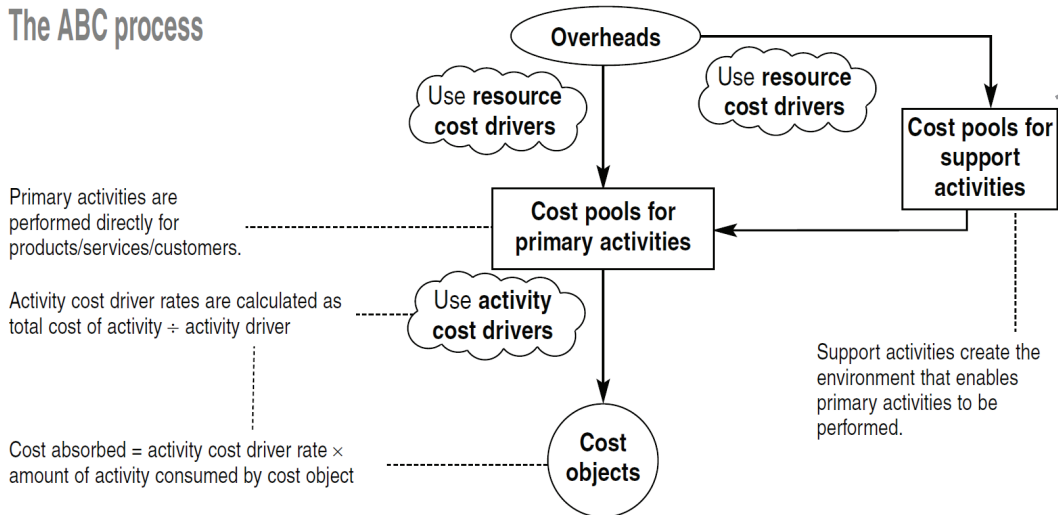
ABC is extensively used in the services sector, not just in manufacturing.

An alternative is time-driven ABC (TDABC) – resource activity is measured in terms of the total potential usable/available time – so cost of idle time can be ascertained.

Such as inspection costs, maintenance costs.

- Part A: Activity-Based Costing (ABC)
- Part B: Strategic revenue and cost management
- Activity-Based Management (ABM)
- Business Process Management (BPM)
- Social and environmental value chain analysis

The ABC process



Merits of ABC

- Absorption costing tends to allocate too great a proportion of overheads to high-volume products (which cause relatively little diversity) and too small a proportion to low-volume products (which cause greater diversity and use more support services), whereas ABC traces a more appropriate amount. This has implications for pricing.
- Ideally suited to customer profitability analysis (CPA) and can be used in service organisations.
- Helps with cost reduction.
- Takes product costing beyond traditional factory floor boundaries and considers overhead functions, such as product design and quality control.
- Can use TDABC if the total cost of idle time is needed; this gets lost with normal ABC

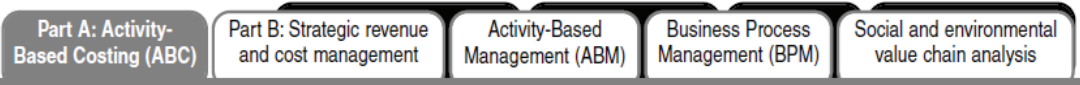
Criticisms of ABC

- More complex than absorption costing.
- Tends to burden low-volume (new) products so threatens innovation.
- Can one cost driver explain the behaviour of all the items in a cost pool?
- Arbitrary cost apportionment needed for eg rent and rates.
- Identifying cost/benefits of implementing ABC is problematic

Factors affecting of design and adoption of ABC

- Operational diversity/complexity.
- Strategic/tactical importance of cost.
- Intensity of competition.
- Unused capacity.
- Implementation of ABC can be viewed as a project. Evaluate the costs/benefits using an appropriate discount rate.

Takes all overheads into account, including non-production overheads such as customer services.



Time-driven activity-based costing (TDABC)

Kaplan and Anderson (2007) – less complex and costly system than ABC

- Step 1** – Identify all organisational resources
- Calculate total cost and capacity of each resources
 - Capacity cost rate (CCR) :

$$\frac{\text{Total resource cost (\$)}}{\text{Total available capacity (minutes) (not including training time etc)}}$$

- Step 2** – Estimate time taken for each unique activity carried or by the resource and multiply by CCR
- Each additional element of task complexity attracts an incremental cost based on additional time taken.

ABC v TDABC

- ABC allocates all costs of a resource to products
- TDABC only allocates costs of available time to products
- TDABC therefore recognise and quantifies idle time costs
- TDABC based surveys of employee activities

A simplification of ABC with a single focus on 'time
Looks at practical capacity, not theoretical capacity.
Key inputs:

- ▶ cost per time Unit of capacity
- ▶ the time units taken for an activity.