Break Even

Break Even Explained

Contents

## Articles

References

Article Licenses

Break-even (economics)

This article is about Break-even (economics). For other uses, see Break-even (disambiguation).

The break-even level or break-even point (BEP) represents the sales amount—in either unit or revenue terms—that is required to cover total costs (both fixed and variable). Total profit at the break-even point is zero. Break-even is only possible if a firm's prices are higher than its variable costs per unit. If so, then each unit of the product sold will generate some "contribution" toward covering fixed costs.[1]

In economics and business, specifically cost accounting, the **break-even point** (BEP) is the point at which total cost and total revenue are equal: there is no net loss or gain, and one has "broken even." A profit or a loss has not been made, although opportunity costs have been "paid," and capital has received the risk-adjusted, expected return. In short, all costs that needs to be paid are paid by the firm but the profit is equal to 0.[2]

The Break-Even Point

For example, if a business sells fewer than 200 tables each month, it will make a loss; if it sells more, it will make a profit. With this information, the business managers will then need to see if they expect to be able to make and sell 200 tables per month.

If they think they cannot sell that many, to ensure viability they could:

1. Try to reduce the fixed costs (by renegotiating rent for example, or keeping better control of telephone bills or other costs)
2. Try to reduce variable costs (the price it pays for the tables by finding a new supplier)
3. Increase the selling price of their tables.

Any of these would reduce the break-even point. In other words, the business would not need to sell so many tables to make sure it could pay its fixed costs.

Purpose

The main purpose of **break-even analysis** is to determine the minimum output that must be exceeded in order to make profit. It also is a rough indicator of the earnings impact of a marketing activity.

The break-even point is one of the simplest yet least used analytical tools in management. It helps to provide a dynamic view of the relationships between sales, costs, and profits. For example, expressing **break-even sales** as a percentage of actual sales can give managers a chance to understand when to expect to break even (by linking the percent to when in the week/month this percent of sales might occur).

The break-even point is a special case of Target Income Sales, where Target Income is 0 (breaking even). This is very important for financial analysis.
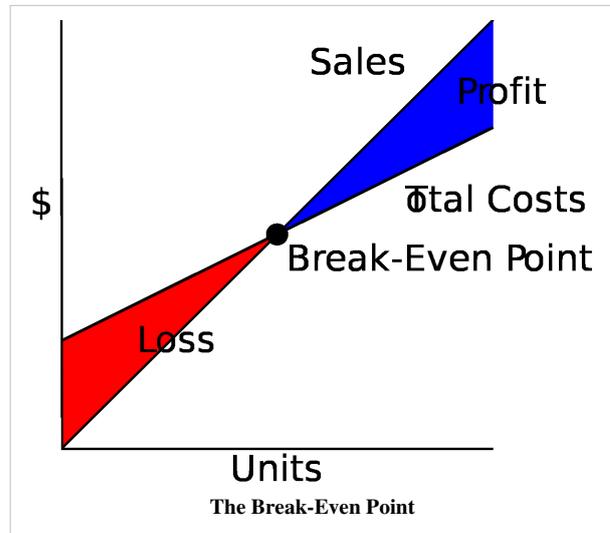
Construction

In the linear Cost-Volume-Profit Analysis model (where marginal costs and marginal revenues are constant, among other assumptions), the **break-even point (BEP)** (in terms of Unit Sales (X)) can be directly computed in terms of Total Revenue (TR) and Total Costs (TC) as:

$$\mathrm{TR} = \mathrm{TC}$$
$$\mathrm{P} \times \mathrm{X} = \mathrm{TFC} + \mathrm{V} \times \mathrm{X}$$
$$\mathrm{P} \times \mathrm{X} - \mathrm{V} \times \mathrm{X} = \mathrm{TFC}$$
$$(\mathrm{P} - \mathrm{V}) \times \mathrm{X} = \mathrm{TFC}$$
$$\mathrm{X} = \frac{\mathrm{TFC}}{\mathrm{P} - \mathrm{V}}$$

where:

- **TFC** is **Total Fixed Costs**,
- **P** is **Unit Sale Price**, and
- **V** is **Unit Variable Cost**.

The quantity, $(\mathrm{P} - \mathrm{V})$, is of interest in its own right, and is called the Unit Contribution Margin (C): it is the marginal profit per unit, or alternatively the portion of each sale that contributes to Fixed Costs. Thus the break-even point can be more simply computed as the point where Total Contribution = Total Fixed Cost:

The Break-Even Point can alternatively be computed as the point where Contribution equals Fixed Costs.
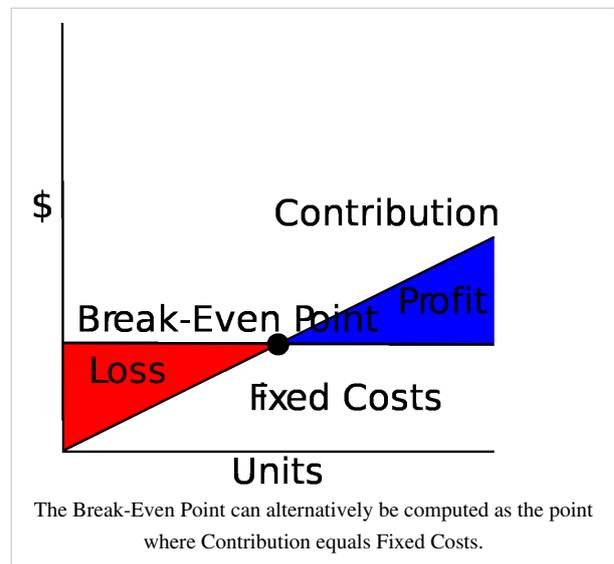
$$\mathrm{Total\ Contribution} = \mathrm{Total\ Fixed\ Costs}$$
$$\mathrm{Unit\ Contribution} \times \mathrm{Number\ of\ Units} = \mathrm{Total\ Fixed\ Costs}$$
$$\mathrm{Number\ of\ Units} = \frac{\mathrm{Total\ Fixed\ Costs}}{\mathrm{Unit\ Contribution}}$$

To calculate the break-even point in terms of revenue (a.k.a. currency units, a.k.a. sales proceeds) instead of Unit Sales (X), the above calculation can be multiplied by Price, or, equivalently, the Contribution Margin Ratio (Unit Contribution Margin over Price) can be calculated: $\mathrm{Break\text{-}even(in\ Sales)} = \frac{\mathrm{Fixed\ Costs}}{\mathrm{C/P}}$.

R=C, Where R is revenue generated, C is cost incurred i.e. Fixed costs + Variable Costs or Q * P (Price per unit) = TFC + Q * VC (Price per unit), Q * P - Q * VC = TFC, Q * (P - VC) = TFC, or, Break Even Analysis Q = TFC/c/s ratio=Break Even

Margin of safety

Margin of safety represents the strength of the business. It enables a business to know what is the exact amount it has gained or lost and whether they are over or below the break-even point.[3] In break-even analysis, margin of safety is the extent by which actual or projected sales exceed the break-even sales.[4]

Margin of safety = (current output - breakeven output)

Margin of safety% = (current output - breakeven output)/current output × 100

When dealing with budgets you would instead replace "Current output" with "Budgeted output." If P/V ratio is given then profit/PV ratio.

Break-even analysis

By inserting different prices into the formula, you will obtain a number of break-even points, one for each possible price charged. If the firm changes the selling price for its product, from $2 to $2.30, in the example above, then it would have to sell only 1000/(2.3 - 0.6)= 589 units to break even, rather than 715.
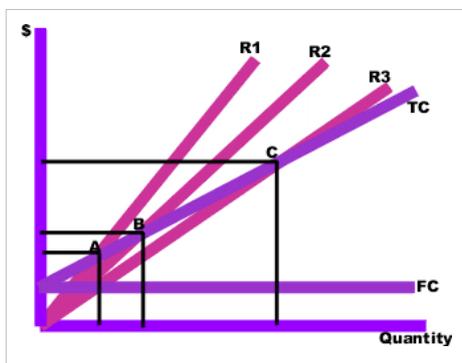
To make the results clearer, they can be graphed. To do this, you draw the total cost curve (TC in the diagram) which shows the total cost associated with each possible level of output, the fixed cost curve (FC) which shows the costs that do not vary with output level, and finally the various total revenue lines (R1, R2, and R3) which show the total amount of revenue received at each output level, given the price you will be charging.

The break-even points (A,B,C) are the points of intersection between the total cost curve (TC) and a total revenue curve (R1, R2, or R3). The break-even quantity at each selling price can be read off the horizontal axis and the break-even price at each selling price can be read off the vertical axis. The total cost, total revenue, and fixed cost curves can each be constructed with simple formula. For example, the total revenue curve is simply the product of selling price times quantity for each output quantity. The data used in these formula come either from accounting records or from various estimation techniques such as regression analysis.

Limitations

- Break-even analysis is only a supply-side (i.e., costs only) analysis, as it tells you nothing about what sales are actually likely to be for the product at these various prices.
- It assumes that fixed costs (FC) are constant. Although this is true in the short run, an increase in the scale of production is likely to cause fixed costs to rise.
- It assumes average variable costs are constant per unit of output, at least in the range of likely quantities of sales. (i.e., linearity).
- It assumes that the quantity of goods produced is equal to the quantity of goods sold (i.e., there is no change in the quantity of goods held in inventory at the beginning of the period and the quantity of goods held in inventory at the end of the period).
- In multi-product companies, it assumes that the relative proportions of each product sold and produced are constant (i.e., the sales mix is constant).

Notes

There is a myth that Black Friday is the annual break-even point in American retail sales, but in fact retailers generally break-even, and indeed profit, nearly every quarter.

References

[1] Farris, Paul W.; Neil T. Bendle; Phillip E. Pfeifer; David J. Reibstein (2010). *Marketing Metrics: The Definitive Guide to Measuring Marketing Performance.* Upper Saddle River, New Jersey: Pearson Education, Inc. ISBN 0-13-705829-2. The Marketing Accountability Standards Board (MASB) endorses the definitions, purposes, and constructs of classes of measures that appear in *Marketing Metrics* as part of its ongoing Common Language: Marketing Activities and Metrics Project (http://www.themasb.org/common-language/).

[2] Tapang, Bienvenido, and Lorelei Mendoza. *Introductory Economics.* University of the Philippines, Baguio.

[3] *The Margin of Safety in MAAW,* Chapter 11 (http://maaw.info/Chapter11.htm#The Margin of Safety).

[4] Margin of Safety Definition | Formula | Calculation | Example (http://accountingexplained.com/managerial/cvp-analysis/margin-of-safety)

External links

- Example of Break Even Point (http://people.revoledu.com/kardi/tutorial/Excel/BreakEvenPoint.html) using Microsoft Excel
- Videos and Tutorials about Break Even Analysis (http://hayajneh.org/g/2010/06/break-even-analysis/)
- Break Even, any profitability ratio search in what-if? model with MS Excel (http://gmroi.eu/en)
- MASB Official Website (http://www.themasb.org/)

Further reading

1. Dayananda, D.; Irons, R.; Harrison, S.; Herbohn, J.; and P. Rowland, 2002, *Capital Budgeting: Financial Appraisal of Investment Projects.* Cambridge University Press. pp. 150.

Contribution margin

Contribution margin, or **dollar contribution per unit**, is the selling price per unit minus the variable cost per unit. "Contribution" represents the portion of sales revenue that is not consumed by variable costs and so contributes to the coverage of fixed costs. This concept is one of the key building blocks of break-even analysis.[1]

In cost-volume-profit analysis, a form of management accounting, contribution margin—the marginal profit per unit sale—is a useful quantity in carrying out various calculations, and can be used as a measure of operating leverage. Typically, low contribution margins are prevalent in the labor-intensive tertiary sector while high contribution margins are prevalent in the capital-intensive industrial sector.

Decomposing Sales as Contribution plus Variable Costs. In the Cost-Volume-Profit Analysis model, costs are linear in volume.

Purpose

Contribution arises in Cost-Volume-Profit Analysis, where it simplifies calculation of net income and, especially, break-even analysis.

Given the contribution margin, a manager can easily compute breakeven and target income sales, and make better decisions about whether to add or subtract a product line, about how to price a product or service, and about how to structure sales commissions or bonuses.

Contribution margin analysis is a measure of operating leverage; it measures how growth in sales translates to growth in profits.

The contribution margin is computed by using a contribution income statement, a management accounting version of the income statement that has been reformatted to group together a business's fixed and variable costs.

Contribution is different from gross margin in that a contribution calculation seeks to separate out variable costs (included in the contribution calculation) from fixed costs (not included in the contribution calculation) on the basis of economic analysis of the nature of the expense, whereas gross margin is determined using accounting standards. Calculating the contribution margin is an excellent tool for managers to help determine whether to keep or drop certain aspects of the business. For example, a production line with positive contribution margin should be kept even it causes negative total profit, when the contribution margin offsets part of the fixed cost. However, it should be dropped if contribution margin is negative because the company would suffer from every unit it produces.[2]

The contribution margin analysis is also applicable when the tax authority performs tax investigations, by identifying target interviewees who have unusually high contribution margin ratios compared to other companies in the same industry.[3]

Contribution margin is also one of the factors to judge whether a company has monopoly power in competition law, such as use of the Lerner Index test.[4]
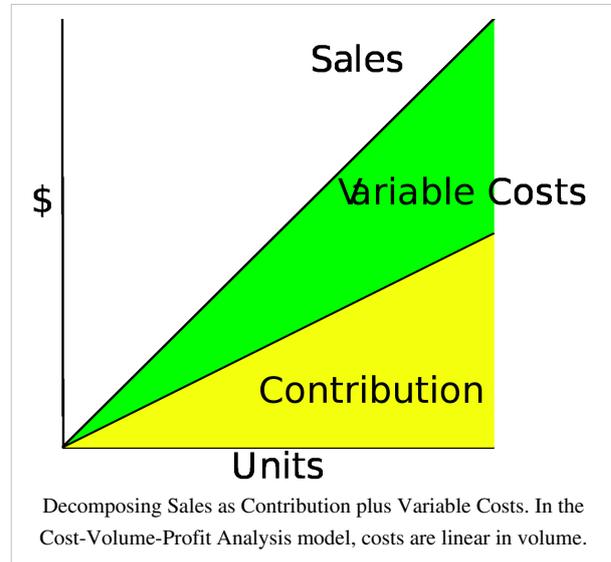
Construction

The **Unit Contribution Margin** (C) is Unit Revenue (Price, P) minus Unit Variable Cost (V):

$$c = p - v$$

The **Contribution Margin Ratio** is the percentage of Contribution over Total Revenue, which can be calculated from the unit contribution over unit price or total contribution over Total Revenue:

$$\frac{C}{P} = \frac{P - V}{P} = \frac{\text{Unit Contribution Margin}}{\text{Price}} = \frac{\text{Total Contribution Margin}}{\text{Total Revenue}}$$

For example, if the price is $10 and the unit variable cost is $2, then the unit contribution margin is $8, and the contribution margin ratio is $8/$10 = 80%.

Contribution margin can be thought of as the fraction of sales that contributes to the offset of fixed costs. Alternatively, unit contribution margin is the amount each unit sale adds to profit: it is the slope of the profit line.

Cost-Volume-Profit Analysis (CVP): assuming the linear CVP model, the computation of Profit and Loss (Net Income) reduces as follows:

Profit and Loss as **Contribution** minus **Fixed Costs**.
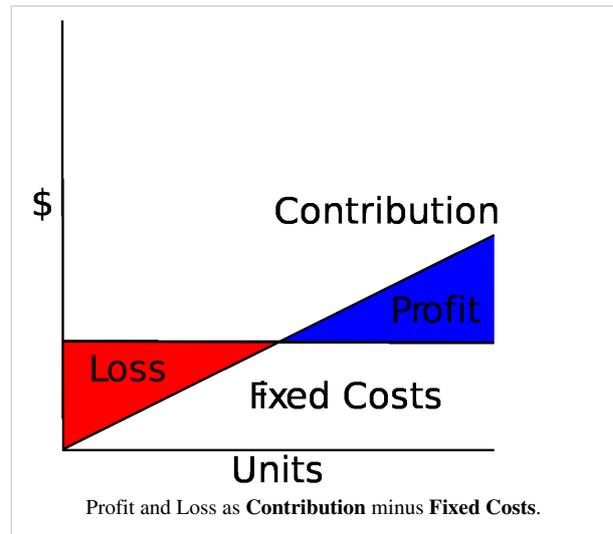
$$\begin{aligned} PL &= TR - TC \\ &= (C + V) \times X - (TFC + V \times X) \\ &= C \times X - TFC \end{aligned}$$

where TC = TFC + TVC is Total Cost = Total Fixed Cost + Total Variable Cost and X is Number of Units. Thus Profit is Unit Contribution times Number of Units, minus the Total Fixed Costs.

The above formula is derived as follows:

From the perspective of the matching principle, one breaks down the revenue from a given sale into a part to cover the Unit Variable Cost, and a part to offset against the Total Fixed Costs. Breaking down Total Costs as:

$$TC = TFC + V \times X$$

one breaks down Total Revenue as:

$$\begin{aligned} TR &= P \times X \\ &= \big((P - V) + V \big) \times X \\ &= (C + V) \times X \\ &= C \times X + V \times X \end{aligned}$$

Thus the Total Variable Costs $TVC = V \times X$ offset, and the Net Income (Profit and Loss) is Total Contribution Margin minus Total Fixed Costs:

$$\begin{aligned} PL &= TR - TC \\ &= (C + V) \times X - (TFC + V \times X) \\ &= C \times X - TFC \\ &= TCM - TFC \end{aligned}$$

Examples

Beta Sales Company Contribution Format Income Statement For Year Ended December 31, 201X

Sales	$ 462,452
Less Variable Costs:	
Cost of Goods Sold	$ 230,934
Sales Commissions	$ 58,852
Delivery Charges	$ 13,984
Total Variable Costs	$ 303,770
Contribution Margin (34%)	$ 158,682
Less Fixed Costs:	
Advertising	$ 1,850
Depreciation	$ 13,250
Insurance	$ 5,400
Payroll Taxes	$ 8,200
Rent	$ 9,600
Utilities	$ 17,801
Wages	$ 40,000
Total Fixed Costs	$ 96,101
Net Operating Income	$ 62,581

The Beta Company's contribution margin for the year was 34 percent. This means that, for every dollar of sales, after the costs that were directly related to the sales were subtracted, 34 cents remained to contribute toward paying for the indirect (fixed) costs and later for profit.

Contribution format income statements can be drawn up with data from more than one year's income statements, when a person is interested in tracking contribution margins over time. Perhaps even more usefully, they can be drawn up for each product line or service. Here's an example, showing a breakdown of Beta's three main product lines.

	Line A	Line B	Line C
Sales	$120,400	$202,050	$140,002
Less Variable Costs:			
Cost of Goods Sold	$70,030	$100,900	$60,004
Sales Commissions	$18,802	$40,050	$0
Delivery Charges	$ 900	$ 8,084	$ 5,000
Total Variable Costs	$ 89,732	$ 149,034	$ 65,004
Contribution Margin	$ 30,668	$ 53,016	$ 74,998
percentage	25%	26%	54%

Although this shows only the top half of the contribution format income statement, it's immediately apparent that Product Line C is Beta's most profitable one, even though Beta gets more sales revenue from Line B (which is also an example of what is called Partial Contribution Margin - an income statement that references only variable costs). It appears that Beta would do well by emphasizing Line C in its product mix. Moreover, the statement indicates that perhaps prices for line A and line B products are too low. This is information that can't be gleaned from the regular

income statements that an accountant routinely draws up each period.

Contribution margin as a measure of efficiency in the operating room

The following discussion focuses on *Contribution Margin (mean) per* operating room *hour* in the operating room and how it relates to operating room efficiency.

FIGURE: **Metric Measure for OR Efficiency**[5]

Metric Measures	0	1	2
Excess Staffing Costs	>10%	5-10%	<5%
Start-time tardiness (mean tardiness for elective cases/day)	>60 min	45-60 min	<45 min
Case cancellation rate	>10%	5-10%	<5%
Post Anesthesia Care Unit (PACU) admission delays (% workdays with at least one delay in PACU admission)	>20%	10-20%	<10%
Contribution Margin (mean) per operating room hour	<$1,000/hr	$1−2,000/hr	>$2,000/hr
Operating Room Turnover Time (mean setup and cleanup turnover times for all cases)	>40 min	25-40 min	<25 min
Prediction Bias (bias in case duration estimates per 8 hours of operating room time)	>15 min	5-15 min	<5 min
Prolonged turnovers (%turnovers > 60 min)	>25%	10-25%	<10%

A surgical suite can schedule itself efficiently but fail to have a positive contribution margin if many surgeons are slow, use too many instruments or expensive implants, etc. These are all measured by the *contribution margin per OR hr*. The contribution margin per hour of OR time is the hospital revenue generated by a surgical case, less all the hospitalization variable labor and supply costs. Variable costs, such as implants, vary directly with the volume of cases performed.

This is because fee-for-service hospitals have a positive contribution margin for almost all elective cases mostly due to a large percentage of OR costs being fixed. For USA hospitals not on a fixed annual budget, contribution margin per OR hour averages one to two thousand USD per OR hour.

References

[1] Farris, Paul W.; Neil T. Bendle; Phillip E. Pfeifer; David J. Reibstein (2010). *Marketing Metrics: The Definitive Guide to Measuring Marketing Performance.* Upper Saddle River, New Jersey: Pearson Education, Inc. ISBN 0-13-705829-2. The Marketing Accountability Standards Board (MASB) endorses the definitions, purposes, and constructs of classes of measures that appear in *Marketing Metrics* as part of its ongoing Common Language: Marketing Activities and Metrics Project (http://www.themasb.org/common-language/).

[2] Hansen,Don R., and Maryanne M. Mowen, *Managerial Accounting* p.529, at http://www.usdoj.gov/atr/public/speeches/future.txt

[3] Tat Chee Tsui. "Interstate Comparison—Use of Contribution Margin in Determination of Price Fixing." *Pace International Law Review* (Apr 2011), at: http://works.bepress.com/tatchee_tsui/2

[4] Motta, M. *Competition Policy: Theory and Practice* (Cambridge 2004), P.110.

[5] Macario, A. "Are Your Hospital Operating Rooms "Efficient"?" *Anesthesiology* 2006; 105:237-40.

Other sources

- Cost-Volume-Profit Analysis (http://maaw.info/CostVolumeProfitMain.htm); Chapter 11 (http://maaw.info/Chapter11.htm) at MAAW
- Cost-Volume-Profit Analysis (http://www.cliffsnotes.com/WileyCDA/CliffsReviewTopic/Cost-Volume-Profit-Analysis.topicArticleId-21248,articleId-21229.html) at CliffNotes
- Cost-Volume-Profit Analysis (http://www.answers.com/topic/cost-volume-profit-cvp-analysis?cat=biz-fin) at Answers.com

External links

- MASB Official Website (http://www.themasb.org/)

Variable cost

Variable costs are costs that change in proportion to the good or service that a business produces.[1] Variable costs are also the sum of marginal costs over all units produced. They can also be considered normal costs. Fixed costs and variable costs make up the two components of total cost. **Direct costs**, however, are costs that can easily be associated with a particular cost object.[2] However, not all variable costs are direct costs. For example, variable manufacturing overhead costs are variable costs that are indirect costs, not direct costs. Variable costs are sometimes called unit-level costs as they vary with the number of units produced.

Direct labor and overhead are often called **conversion cost**,[3] while direct material and direct labor are often referred to as **prime cost**.

Decomposing Total Costs as Fixed Costs plus **Variable Costs**.

In marketing, it is necessary to know how costs divide between variable and fixed. This distinction is crucial in forecasting the earnings generated by various changes in unit sales and thus the financial impact of proposed marketing campaigns. In a survey of nearly 200 senior marketing managers, 60 percent responded that they found the "variable and fixed costs" metric very useful.[4]

Explanation

Example 1

Assume a business produces clothing. A variable cost of this product would be the direct material, i.e., cloth, and the direct labor. If it takes one laborer 6 yards of cloth and 8 hours to make a shirt, then the cost of labor and cloth increases if two shirts are produced.
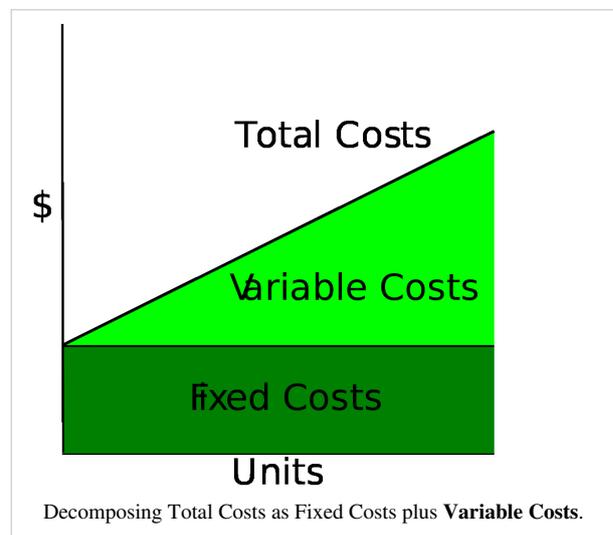
	1 shirt	2 shirts	3 shirts
Cloth (Direct Materials)	6yds	12yds	18yds
Labor (Direct Labor)	8hrs	16hrs	24hrs

The amount of materials and labor that goes into each shirt increases in direct proportion to the number of shirts produced. In this sense, the cost "varies" as production varies.

Example 2

For example, a firm pays for raw materials. When activity is decreased, less raw material is used, and so the spending for raw materials falls. When activity is increased, more raw material is used, and spending therefore rises. Note that the changes in expenses happen with little or no need for managerial intervention. These costs are variable costs.

A company will pay for line rental and maintenance fees each period regardless of how much power gets used. And some electrical equipment (air conditioning or lighting) may be kept running even in periods of low activity. These expenses can be regarded as fixed. But beyond this, the company will use electricity to run plant and machinery as required. The busier the company, the more the plant will be run, and so the more electricity gets used. This extra spending can therefore be regarded as variable.

In retail the cost of goods is almost entirely a variable cost; this is not true of manufacturing where many fixed costs, such as depreciation, are included in the cost of goods.

Although taxation usually varies with profit, which in turn varies with sales volume, it is not normally considered a variable cost.

For some employees, salary is paid on monthly rates, independent of how many hours the employees work. This is a fixed cost. On the other hand, the hours of hourly employees can often be varied, so this type of labour cost is a variable cost. The cost of material is a variable cost.

Notes

[1] Garrison, Noreen, Brewer. Ch 2 - Managerial Accounting and Costs Concepts, pp 48
[2] Garrison, Noreen, Brewer. Ch 2 - Managerial Accounting and Costs Concepts, pp 51
[3] Garrison, Noreen, Brewer. Ch 2 - Managerial Accounting and Costs Concepts, pp 39
[4] Farris, Paul W.; Neil T. Bendle; Phillip E. Pfeifer; David J. Reibstein (2010). *Marketing Metrics: The Definitive Guide to Measuring Marketing Performance.* Upper Saddle River, New Jersey: Pearson Education, Inc. ISBN 0-13-705829-2. Content used from this source has been licensed under CC-By-SA and GFDL and may be reproduced verbatim. The Marketing Accountability Standards Board (MASB) endorses the definitions, purposes, and constructs of classes of measures that appear in *Marketing Metrics* as part of its ongoing Common Language: Marketing Activities and Metrics Project (http://www.themasb.org/common-language-project/).

References

• Garrison, Ray H; Eric W. Noreen; Peter C. Brewer (2009). *Managerial Accounting* (http://www.mhhe.com/garrison13e) (13e ed.). McGraw-Hill Irwin. ISBN 978-0-07-337961-6.

Cost of goods sold

Accounting
• **Historical cost accounting**
• **Constant purchasing power accounting**
• **Management accounting**
• **Tax accounting**
Business portal
• v
• t
• e [1]

Cost of goods sold or COGS refer to the carrying value of goods sold during a particular period.

Costs are associated with particular goods using one of several formulas, including specific identification, first-in first-out (FIFO), or average cost. Costs include all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. Costs of goods made by the business include material, labor, and allocated overhead. The costs of those goods not yet sold are deferred as costs of inventory until the inventory is sold or written down in value.

Overview

Many businesses sell goods that they have bought or produced. When the goods are bought or produced, the costs associated with such goods are capitalized as part of inventory (or stock) of goods.[2] These costs are treated as an expense in the period the business recognizes income from sale of the goods.[3]

Determining costs requires keeping records of goods or materials purchased and any discounts on such purchase. In addition, if the goods are modified,[4] the business must determine the costs incurred in modifying the goods. Such modification costs include labor, supplies or additional material, supervision, quality control and use of equipment. Principles for determining costs may be easily stated, but application in practice is often difficult due to a variety of considerations in the allocation of costs.[5]

Cost of goods sold may also reflect adjustments. Among the potential adjustments are decline in value of the goods (i.e., lower market value than cost), obsolescence, damage, etc.

When multiple goods are bought or made, it may be necessary to identify which costs relate to which particular goods sold. This may be done using an identification convention, such as specific identification of the goods, first-in-first-out (FIFO), or average cost. Alternative systems may be used in some countries, such as last-in-first-out (LIFO), gross profit method, retail method, or combinations of these.

Cost of goods sold may be the same or different for accounting and tax purposes, depending on the rules of the particular jurisdiction. Certain expenses are included in COGS. Expenses that are included in COGS cannot be deducted again as a business expense. COGS expenses include:

- The cost of products or raw materials, including freight or shipping charges;
- The cost of storing products the business sells;

- Direct labor costs for workers who produce the products; and
- Factory overhead expenses.

Importance of inventories

Inventories have a significant effect on profits. A business that makes or buys goods to sell must keep track of inventories of goods under all accounting and income tax rules. An example illustrates why. Fred buys auto parts and resells them. In 2008, Fred buys $100 worth of parts. He sells parts for $80 that he bought for $30, and has $70 worth of parts left. In 2009, he sells the remainder of the parts for $180. If he keeps track of inventory, his profit in 2008 is $50, and his profit in 2009 is $110, or $160 in total. If he deducted all the costs in 2008, he would have a loss of $20 in 2008 and a profit of $180 in 2009. The total is the same, but the timing is much different. Most countries' accounting and income tax rules (if the country has an income tax) require the use of inventories for all businesses that regularly sell goods they have made or bought.

Cost of goods for resale

Cost of goods purchased for resale includes purchase price as well as all other costs of acquisitions,[6] excluding any discounts.

Additional costs may include freight paid to acquire the goods, customs duties, sales or use taxes not recoverable paid on materials used, and fees paid for acquisition. For financial reporting purposes such period costs as purchasing department, warehouse, and other operating expenses are usually not treated as part of inventory or cost of goods sold. For U.S. income tax purposes, some of these period costs must be capitalized as part of inventory.[7] Costs of selling, packing, and shipping goods to customers are treated as operating expenses related to the sale. Both International and U.S. accounting standards require that certain abnormal costs, such as those associated with idle capacity, must be treated as expenses rather than part of inventory.

Discounts that must be deducted from the costs of purchased inventory are the following:

- Trade discounts (reduction in the price of goods that a manufacturer or wholesaler provides to a retailer) - includes a discount that is always allowed, regardless of the time of payment.
- Manufacturer's rebates—is based on the dealer's purchases during the year.
- Cash discounts (a reduction in the invoice price that the seller provides if the dealer pays immediately or within a specified time)—it may reduce COGS, or it may be treated separately as gross income.[8]

Value added tax is generally not treated as part of cost of goods sold if it may be used as an input credit or otherwise recoverable from the taxing authority.[9]

Cost of goods made by the business

The cost of goods produced in the business should include all costs of production.[10] The key components of cost generally include:

- Parts, raw materials and supplies used,
- Labor, including associated costs such as payroll taxes and benefits, and
- Overhead of the business allocable to production.

Most businesses make more than one of a particular item. Thus, costs are incurred for multiple items rather than a particular item sold. Determining how much of each of these components to allocate to particular goods requires either tracking the particular costs or making some allocations of costs. Parts and raw materials are often tracked to particular sets (*e.g.*, batches or production runs) of goods, then allocated to each item.

Labor costs include direct labor and indirect labor. Direct labor costs are the wages paid to those employees who spend all their time working directly on the product being manufactured. Indirect labor costs are the wages paid to

other factory employees involved in production. Costs of payroll taxes and fringe benefits are generally included in labor costs, but may be treated as overhead costs. Labor costs may be allocated to an item or set of items based on timekeeping records.

Costs of materials include direct raw materials, as well as supplies and indirect materials. Where non-incidental amounts of supplies are maintained, the taxpayer must keep inventories of the supplies for income tax purposes, charging them to expense or cost of goods sold as used rather than as purchased.

Materials and labor may be allocated based on past experience, or *standard* costs. Where materials or labor costs for a period exceed the expected amount of standard costs, a *variance*. Such variances are then allocated among cost of goods sold and remaining inventory at the end of the period.

Determining overhead costs often involves making assumptions about what costs should be associated with production activities and what costs should be associated with other activities. Traditional cost accounting methods attempt to make these assumptions based on past experience and management judgment as to factual relationships. Activity based costing attempts to allocate costs based on those factors that drive the business to incur the costs.

Overhead costs are often allocated to sets of produced goods based on the ratio of labor hours or costs or the ratio of materials used for producing the set of goods. Overhead costs may be referred to as factory overhead or factory burden for those costs incurred at the plant level or *overall burden* for those costs incurred at the organization level. Where labor hours are used, a *burden rate* or overhead cost per hour of labor may be added along with labor costs. Other methods may be used to associate overhead costs with particular goods produced. Overhead rates may be standard rates, in which case there may be variances, or may be adjusted for each set of goods produced.

Variable production overheads are allocated to units produced based on actual use of production facilities. Fixed production overheads are often allocated based on normal capacities or expected production.[11] More or fewer goods may be produced than expected when developing cost assumptions (like burden rates). These differences in production levels often result in too much or too little cost being assigned to the goods produced. This also gives rise to variances.

Identification conventions

In some cases, the cost of goods sold may be identified with the item sold. Ordinarily, however, the identity of goods is lost between the time of purchase or manufacture and the time of sale.[12] Determining which goods have been sold, and the cost of those goods, requires either identifying the goods or using a convention to assume which goods were sold. This may be referred to as a cost flow assumption or inventory identification assumption or convention.[13] The following methods are available in many jurisdictions for associating costs with goods sold and goods still on hand:

- Specific identification. Under this method, particular items are identified, and costs are tracked with respect to each item.[14] This may require considerable recordkeeping. This method cannot be used where the goods or items are indistinguishable or fungible.
- Average cost. The average cost method relies on average unit cost to calculate cost of units sold and ending inventory. Several variations on the calculation may be used, including weighted average and moving average.
- First-In First-Out (FIFO) assumes that the items purchased or produced first are sold first. Costs of inventory per unit or item are determined at the time made or acquired. The oldest cost (*i.e.*, the first in) is then matched against revenue and assigned to cost of goods sold.
- Last-In First-Out (LIFO) is the reverse of FIFO. Some systems permit determining the costs of goods at the time acquired or made, but assigning costs to goods sold under the assumption that the goods made or acquired last are sold first. Costs of specific goods acquired or made are added to a pool of costs for the type of goods. Under this system, the business may maintain costs under FIFO but track an offset in the form of a LIFO reserve. Such reserve (an asset or contra-asset) represents the difference in cost of inventory under the FIFO and LIFO assumptions. Such amount may be different for financial reporting and tax purposes in the United States.

- Dollar Value LIFO. Under this variation of LIFO, increases or decreases in the LIFO reserve are determined based on dollar values rather than quantities.
- Retail inventory method. Resellers of goods may use this method to simplify recordkeeping. The calculated cost of goods on hand at the end of a period is the ratio of cost of goods acquired to the retail value of the goods times the retail value of goods on hand. Cost of goods acquired includes beginning inventory as previously valued plus purchases. Cost of goods sold is then beginning inventory plus purchases less the calculated cost of goods on hand at the end of the period.

Example

Jane owns a business that resells machines. At the start of 2009, she has no machines or parts on hand. She buys machines A and B for 10 each, and later buys machines C and D for 12 each. All the machines are the same, but they have serial numbers. Jane sells machines A and C for 20 each. Her cost of goods sold depends on her inventory method. Under specific identification, the cost of goods sold is 10 + 12, the particular costs of machines A and C. If she uses FIFO, her costs are 20 (10+10). If she uses average cost, her costs are 22 ((10+10+12+12)/4 x 2). If she uses LIFO, her costs are 24 (12+12). Thus, her profit for accounting and tax purposes may be 20, 18, or 16, depending on her inventory method. After the sales, her inventory values are either 20, 22 or 24.

After year end, Jane decides she can make more money by improving machines B and D. She buys and uses 10 of parts and supplies, and it takes 6 hours at 2 per hour to make the improvements to each machine. Jane has overhead, including rent and electricity. She calculates that the overhead adds 0.5 per hour to her costs. Thus, Jane has spent 20 to improve each machine (10/2 + 12 + (6 x 0.5)). She sells machine D for 45. Her cost for that machine depends on her inventory method. If she used FIFO, the cost of machine D is 12 plus 20 she spent improving it, for a profit of 13. Remember, she used up the two 10 cost items already under FIFO. If she uses average cost, it is 11 plus 20, for a profit of 14. If she used LIFO, the cost would be 10 plus 20 for a profit of 15.

In year 3, Jane sells the last machine for 38 and quits the business. She recovers the last of her costs. Her total profits for the three years are the same under all inventory methods. Only the timing of income and the balance of inventory differ. Here is a comparison under FIFO, Average Cost, and LIFO:

Year	Sales	Cost of Goods Sold			------ Profit ------		
		FIFO	Avg.	LIFO	FIFO	Avg.	LIFO
1	40	20	22	24	20	18	16
2	45	32	31	30	13	14	15
3	38	32	31	30	6	7	8
Total	123	84	84	84	39	39	39

Write-downs and allowances

The value of goods held for sale by a business may decline due to a number of factors. The goods may prove to be defective or below normal quality standards (subnormal). The goods may become obsolete. The market value of the goods may simply decline due to economic factors.

Where the market value of goods has declined for whatever reasons, the business may choose to value its inventory at the lower of cost or market value, also known as *net realizable value*.[15] This may be recorded by accruing an expense (*i.e.*, creating an inventory reserve) for declines due to obsolescence, etc. Current period net income as well as net inventory value at the end of the period is reduced for the decline in value.

Any property held by a business may decline in value or be damaged by unusual events, such as a fire. The loss of value where the goods are destroyed is accounted for as a loss, and the inventory is fully written off. Generally, such

loss is recognized for both financial reporting and tax purposes. However, book and tax amounts may differ under some systems.

Alternative views

Alternatives to traditional cost accounting have been proposed by various management theorists. These include:

- Throughput Accounting, under the Theory of Constraints, under which only Totally variable costs are included in cost of goods sold and inventory is treated as investment.
- Lean accounting, in which most traditional costing methods are ignored in favor of measuring weekly "value streams".
- Resource consumption accounting, which discards most current accounting concepts in favor of proportional costing based on simulations.

None of these views conform to U.S. Generally Accepted Accounting Principles or International Accounting Standards, nor are any accepted for most income or other tax reporting purposes.

Further reading

- Fox, Stephen C, *Income Tax in the USA* chapter 23, 2013 edition ISBN 978-0-9851-8233-5, ASIN B00BCSNOGG.
- Horngren, Charles T., *et al.*: *Cost Accounting: A Managerial Emphasis* ISBN 978-0-1329-6064-9 ASIN B00B6F3AWI.
- Kieso, Donald E; Weygandt, Jerry J.; and Warfield, Terry D.: *Intermediate Accounting*, Chapters 8 and 9. ISBN 978-0-4705-8723-2 ASIN B006PKWD8G.
- Kinney, Michael R.: *Cost Accounting: Foundations and Evolutions*. ISBN 978-1-1119-7172-4.
- Lanen, William, *et al.*: "Fundamentals of Cost Accounting. *ISBN 978-0-0735-2711-6 ASIN B005MR88U0.*
- Walter, Larry: *Principles of Accounting*, Chapter 8, Inventory [16].

Formal guidance

- International Accounting Standards IAS 2 [17], Inventories.
- U.S. Internal Revenue Service Publication 334 [18], *Tax Guide for Small Business*, pages 27–29.
- U.S. Financial Accounting Standards Board ASC 330 [19].

References

[1] http://en.wikipedia.org/w/index.php?title=Template:Accounting&action=edit

[2] U.S. Financial Accounting Standards Board (FASB) Accounting Standards Codification ASC 330-10-30-1 (http://asc.fasb.org/section& trid=2127012&analyticsAssetName=subtopic_page_subsection&nav_type=subtopic_page#d3e3594-108311); International Accounting Standards IAS 2 (http://eifrs.iasb.org/eifrs/bnstandards/en/ias2.pdf), paragraph 10.

[3] IAS 2, paragraph 34.

[4] This includes manufacturing from parts or raw materials.

[5] ASC 330-10-30-2.

[6] ASC 330-10-30-1; IAS 2, paragraph 11.

[7] 26 USC 263A (http://www.law.cornell.edu/uscode/html/uscode26/usc_sec_26_00000263---A000-.html), 26 CFR 1.263A-3(c) (http:// ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div8&view=text&node=26:3.0.1.1.1.0.5.157&idno=26).

[8] Presti & Naegele Newsletter (http://www.prestinaegele.com/faq-what-is-cost-of-goods-sold) FAQ: What is "cost of goods sold"?

[9] IAS 2, paragraph 11.

[10] ASC 330-10-30-1; IAS 2, paragraphs 12-14; 26 USC 263A(a)(2). (http://www.law.cornell.edu/uscode/html/uscode26/ usc_sec_26_00000263---A000-.html).

[11] ASC 330-10-30-3; IAS 2 paragraph 13.

[12] ASC 330-10-30-10.

[13] ASC 330-10-30-9.

[14] IAS 2, paragraph 24.

[15] ASC 330-10-35; IAS 2, paragraphs 28-33.

[16] http://www.principlesofaccounting.com/chapter%208.htm

[17] http://eifrs.iasb.org/eifrs/bnstandards/en/ias2.pdf

[18] http://www.irs.gov/pub/irs-pdf/p334.pdf

[19] http://asc.fasb.org/section&
trid=2127012%26analyticsAssetName=subtopic_page_subsection%26nav_type=subtopic_page#d3e3643-108311

Economics

This article is about the social science. For other uses, see Economics (disambiguation).

For a topical guide to this subject, see Outline of economics.

Economics

World GDP (PPP) per capita by country (2012)

- Index
- Outline
- Category

- History
- Types
- Classification
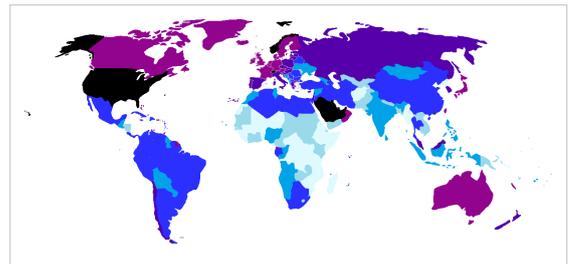
- History of economics
- Economic history (academic study)
- Schools of economics

- Microeconomics
- Macroeconomics
- Heterodox economics
- Methodology
- JEL classification codes

- Theory
- Techniques

- Econometrics
- Economic growth
- Economic system
- Experimental
- Mathematical
- Game theory
- National accounting

By application

- Agricultural
- Behavioral
- Business
- Computational
- Cultural
- Demographic
- Development
- Ecological

- Education
- Environmental
- Evolutionary
- Expeditionary
- Geography
- Health
- Industrial organization
- Information
- International
- Labour
- Law
- Managerial
- Monetary / Financial
- Natural resource
- Personnel
- Public / Welfare economics
- Regional
- Rural
- Urban
- Welfare

Lists

- Economists
- Publications (journals)
- Business and economics portal
- v
- t
- e [1]

Economics is the social science that studied economic activity to gain an understanding of the processes that govern the production, distribution and consumption of goods and services in an exchange economy.

The term *economics* comes from the Ancient Greek οἰκονομία (*oikonomia*, "management of a household, administration") from οἶκος (*oikos*, "house") and νόμος (*nomos*, "custom" or "law"), hence "rules of the house(hold for good management)". 'Political economy' was the earlier name for the subject, but economists in the late 19th century suggested "economics" as a shorter term for "economic science" to establish itself as a separate discipline outside of political science and other social sciences.[2]

Economics focuses on the behavior and interactions of economic agents and how economies work. Consistent with this focus, primary textbooks often distinguish between microeconomics and macroeconomics. Microeconomics examines the behavior of basic elements in the economy, including individual agents and markets, their interactions, and the outcomes of interactions. Individual agents may include, for example, households, firms, buyers, and sellers. Macroeconomics analyzes the entire economy (meaning aggregated production, consumption, savings, and investment) and issues affecting it, including unemployment of resources (labor, capital, and land), inflation, economic growth, and the public policies that address these issues (monetary, fiscal, and other policies).

Other broad distinctions within economics include those between positive economics, describing "what is," and normative economics, advocating "what ought to be"; between economic theory and applied economics; between rational and behavioral economics; and between mainstream economics (more "orthodox" and dealing with the "rationality-individualism-equilibrium nexus") and heterodox economics (more "radical" and dealing with the "institutions-history-social structure nexus").[3][4]

Besides the traditional concern in production, distribution, and consumption in an economy, economic analysis may be applied throughout society, as *in* business, finance, health care, and government. Economic analyses may also be applied *to* such diverse subjects as crime,[5] education,[6] the family, law, politics, religion,[7] social institutions, war,[8] and science;[9] by considering the economic aspects of these subjects. Education, for example, requires time, effort, and expenses, plus the foregone income and experience, yet these losses can be weighted against future benefits education may bring to the agent or the economy. At the turn of the 21st century, the expanding domain of economics in the social sciences has been described as economic imperialism.[10]

A world map of GDP growth (annualized), from 1990 to 2007.
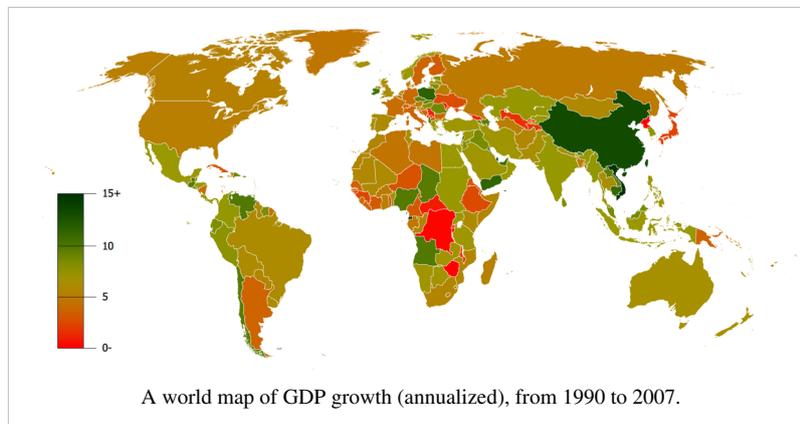
Definitions

There are a variety of modern definitions of economics. Some of the differences may reflect evolving views of the subject or different views among economists.[11] Scottish philosopher Adam Smith (1776) defined what was then called political economy as "an inquiry into the nature and causes of the wealth of nations", in particular as:

A map of world economies by size of GDP (nominal) in $US, *CIA World Factbook*, 2011.

> a branch of the science of a statesman or legislator [with the twofold objectives of providing] a plentiful revenue or subsistence for the people ... [and] to supply the state or commonwealth with a revenue for the publick services.[12]

J.-B. Say (1803), distinguishing the subject from its public-policy uses, defines it as the science *of* production, distribution, and consumption of wealth.[13] On the satirical side, Thomas Carlyle (1849) coined "the dismal science" as an epithet for classical economics, in this context, commonly linked to the pessimistic analysis of Malthus (1798).[14] John Stuart Mill (1844) defines the subject in a social context as:

> The science which traces the laws of such of the phenomena of society as arise from the combined operations of mankind for the production of wealth, in so far as those phenomena are not modified by the pursuit of any other object.[15]

Alfred Marshall provides a still widely cited definition in his textbook *Principles of Economics* (1890) that extends analysis beyond wealth and from the societal to the microeconomic level:

> Economics is a study of man in the ordinary business of life. It enquires how he gets his income and how he uses it. Thus, it is on the one side, the study of wealth and on the other and more important side, a part of the
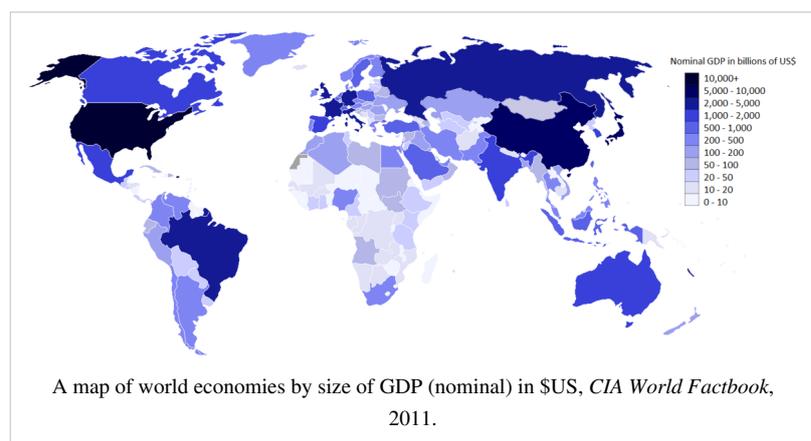
study of man.[16]

Lionel Robbins (1932) developed implications of what has been termed "[p]erhaps the most commonly accepted current definition of the subject":[17]

> Economics is a science which studies human behaviour as a relationship between ends and scarce means which have alternative uses.[18]

Robbins describes the definition as not *classificatory* in "pick[ing] out certain *kinds* of behaviour" but rather *analytical* in "focus[ing] attention on a particular *aspect* of behaviour, the form imposed by the influence of scarcity."[19] He affirmed that previous economist have usually centered their studies on the analysis of wealth: how wealth is created (production), distributed, and consumed; and how wealth can grow.[20] But he said that economics can be used to study other things, such as war, that are outside its usual focus. This is because war has as the goal winning it (as a sought after **end**), generates both cost and benefits; and, **resources** (human life and other costs) are used to attain the goal. If the war is not winnable or if the expected costs outweigh the benefits, the deciding **actors** (assuming they are rational) may never go to war (a **decision**) but rather explore other alternatives. We cannot define economics as the science that study wealth, war, crime, education, and any other field economic analysis can be applied to; but, as the science that study a particular common aspect of each of those subjects (they all use scarce resources to attain a sought after end).

Some subsequent comments criticized the definition as overly broad in failing to limit its subject matter to analysis of markets. From the 1960s, however, such comments abated as the economic theory of maximizing behavior and rational-choice modeling expanded the domain of the subject to areas previously treated in other fields.[21] There are other criticisms as well, such as in scarcity not accounting for the macroeconomics of high unemployment.[22]

Gary Becker, a contributor to the expansion of economics into new areas, describes the approach he favors as "combin[ing the] assumptions of maximizing behavior, stable preferences, and market equilibrium, used relentlessly and unflinchingly."[23] One commentary characterizes the remark as making economics an approach rather than a subject matter but with great specificity as to the "choice process and the type of social interaction that [such] analysis involves." The same source reviews a range of definitions included in principles of economics textbooks and concludes that the lack of agreement need not affect the subject-matter that the texts treat. Among economists more generally, it argues that a particular definition presented may reflect the direction toward which the author believes economics is evolving, or should evolve.[24]

Microeconomics

Main article: Microeconomics

Markets

Main article: Markets

Microeconomics examines how entities, forming a market structure, interact within a market to create a market system. These entities include private and public players with various classifications, typically operating under scarcity of tradeable units and government regulation. The item traded may be a tangible product such as apples or a service such as repair services, legal counsel, or entertainment.

Economists study trade, production and consumption decisions, such as those that occur in a traditional marketplace.

In theory, in a free market the aggregates (sum of) of *quantity demanded* by buyers and *quantity supplied* by sellers will be equal and reach economic equilibrium over time in reaction to price changes; in practice, various issues may prevent equilibrium, and any equilibrium reached may not necessarily be morally equitable. For example, if the supply of healthcare services is limited by external factors, the equilibrium price may be unaffordable for many who desire it but cannot pay for it.

Various market structures exist. In perfectly competitive markets, no participants are large enough to have the market power to set the price of a homogeneous product. In other words, every participant is a "price taker" as no participant influences the price of a product. In the real world, markets often experience imperfect competition.

In Virtual Markets, buyer and seller are not present and trade via intermediates and electronic information. Pictured: São Paulo Stock Exchange, Brazil.

Forms include monopoly (in which there is only one seller of a good), duopoly (in which there are only two sellers of a good), oligopoly (in which there are few sellers of a good), monopolistic competition (in which there are many sellers producing highly differentiated goods), monopsony (in which there is only one buyer of a good), and oligopsony (in which there are few buyers of a good). Unlike perfect competition, imperfect competition invariably means market power is unequally distributed. Firms under imperfect competition have the potential to be "price makers", which means that, by holding a disproportionately high share of market power, they can influence the prices of their products.

Microeconomics studies individual markets by simplifying the economic system by assuming that activity in the market being analysed does not affect other markets. This method of analysis is known as partial-equilibrium analysis (supply and demand). This method aggregates (the sum of all activity) in only one market. General-equilibrium theory studies various markets and their behaviour. It aggregates (the sum of all activity) across *all* markets. This method studies both changes in markets and their interactions leading towards equilibrium.[25]

Production, cost, and efficiency

Main articles: Production theory basics, Opportunity cost, Economic efficiency and Production–possibility frontier

In microeconomics, production is the conversion of inputs into outputs. It is an economic process that uses inputs to create a commodity or a service for exchange or direct use. Production is a flow and thus a rate of output per period of time. Distinctions include such production alternatives as for consumption (food, haircuts, etc.) vs. investment goods (new tractors, buildings, roads, etc.), public goods (national defense, smallpox vaccinations, etc.) or private goods (new computers, bananas, etc.), and "guns" vs. "butter".

Opportunity cost refers to the economic cost of production: the value of the next best opportunity foregone. Choices must be made between desirable yet mutually exclusive actions. It has been described as expressing "the basic relationship between scarcity and choice.".[26] The opportunity cost of an activity is an element in ensuring that scarce resources are used efficiently, such that the cost is weighed against the value of that activity in deciding on more or less of it. Opportunity costs are not restricted to monetary or financial costs but could be measured by the real cost of output forgone, leisure, or anything else that provides the alternative benefit (utility).[27]

Inputs used in the production process include such primary factors of production as labour services, capital (durable produced goods used in production, such as an existing factory), and land (including natural resources). Other inputs may include intermediate goods used in production of final goods, such as the steel in a new car.

Economic efficiency describes how well a system generates desired output with a given set of inputs and available technology. Efficiency is improved if more output is generated without changing inputs, or in other words, the amount of "waste" is reduced. A widely accepted general standard is Pareto efficiency, which is reached when no further change can make someone better off without making someone else worse off.

The production–possibility frontier (PPF) is an expository figure for representing scarcity, cost, and efficiency. In the simplest case an economy can produce just two goods (say "guns" and "butter"). The PPF is a table or graph (as at the right) showing the different quantity combinations of the two goods producible with a given technology and total factor inputs, which limit feasible total output. Each point on the curve shows potential total output for the economy, which is the maximum feasible output of one good, given a feasible output quantity of the other good.

Scarcity is represented in the figure by people being willing but unable in the aggregate to consume *beyond the PPF* (such as at *X*) and by the negative slope of the curve.[28] If production of one good *increases* along the curve,

An example production–possibility frontier with illustrative points marked.

production of the other good *decreases*, an inverse relationship. This is because increasing output of one good requires transferring inputs to it from production of the other good, decreasing the latter.
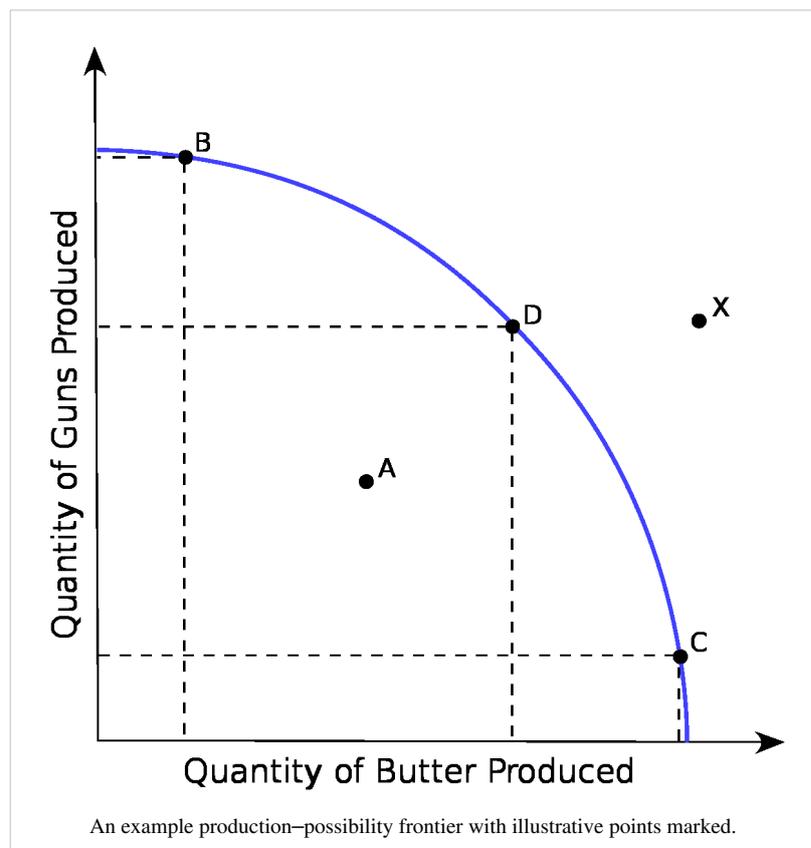
The slope of the curve at a point on it gives the trade-off between the two goods. It measures what an additional unit of one good costs in units forgone of the other good, an example of a *real opportunity cost*. Thus, if one more Gun costs 100 units of butter, the opportunity cost of one Gun is 100 Butter. *Along the PPF*, scarcity implies that choosing *more* of one good in the aggregate entails doing with *less* of the other good. Still, in a market economy, movement along the curve may indicate that the choice of the increased output is anticipated to be worth the cost to the agents.

By construction, each point on the curve shows *productive efficiency* in maximizing output for given total inputs. A point *inside* the curve (as at *A*), is feasible but represents *production inefficiency* (wasteful use of inputs), in that output of *one or both goods* could increase by moving in a northeast direction to a point on the curve. Examples cited of such inefficiency include high unemployment during a business-cycle recession or economic organization of a country that discourages full use of resources. Being on the curve might still not fully satisfy allocative efficiency (also called Pareto efficiency) if it does not produce a mix of goods that consumers prefer over other points.

Much applied economics in public policy is concerned with determining how the efficiency of an economy can be improved. Recognizing the reality of scarcity and then figuring out how to organize society for the most efficient use of resources has been described as the "essence of economics", where the subject "makes its unique contribution."

Specialization

Main articles: Division of labour, Comparative advantage and Gains from trade

Specialization is considered key to economic efficiency based on theoretical and empirical considerations. Different individuals or nations may have different real opportunity costs of production, say from differences in stocks of human capital per worker or capital/labour ratios. According to theory, this may give a comparative advantage in production of goods that make more intensive use of the relatively more abundant, thus *relatively* cheaper, input.

A map showing the main trade routes for goods within late medieval Europe.
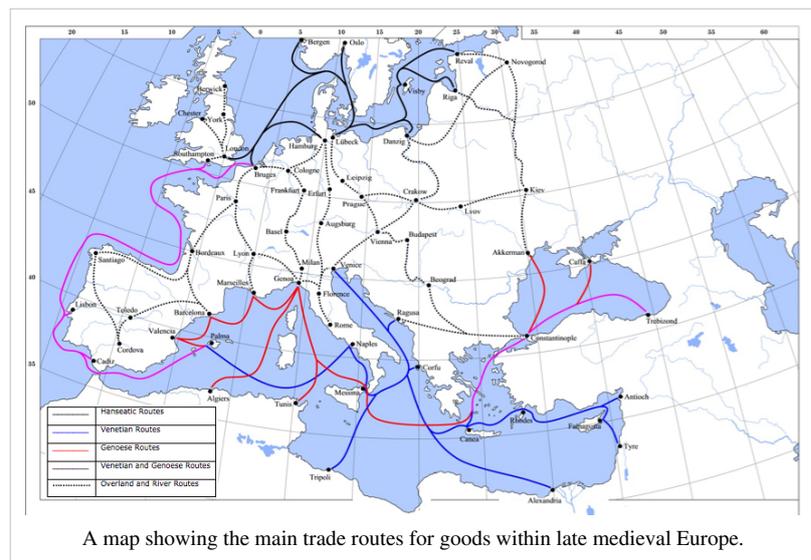
Even if one region has an absolute advantage as to the ratio of its outputs to inputs in every type of output, it may still specialize in the output in which it has a comparative advantage and thereby gain from trading with a region that lacks any absolute advantage but has a comparative advantage in producing something else.

It has been observed that a high volume of trade occurs among regions even with access to a similar technology and mix of factor inputs, including high-income countries. This has led to investigation of economies of scale and agglomeration to explain specialization in similar but differentiated product lines, to the overall benefit of respective trading parties or regions.[29]

The general theory of specialization applies to trade among individuals, farms, manufacturers, service providers, and economies. Among each of these production systems, there may be a corresponding *division of labour* with different work groups specializing, or correspondingly different types of capital equipment and differentiated land uses.[30]

An example that combines features above is a country that specializes in the production of high-tech knowledge products, as developed countries do, and trades with developing nations for goods produced in factories where

labour is relatively cheap and plentiful, resulting in different in opportunity costs of production. More total output and utility thereby results from specializing in production and trading than if each country produced its own high-tech and low-tech products.

Theory and observation set out the conditions such that market prices of outputs and productive inputs select an allocation of factor inputs by comparative advantage, so that (relatively) low-cost inputs go to producing low-cost outputs. In the process, aggregate output may increase as a by-product or by design.[31] Such specialization of production creates opportunities for *gains from trade* whereby resource owners benefit from trade in the sale of one type of output for other, more highly valued goods. A measure of gains from trade is the *increased income levels* that trade may facilitate.[32]

Supply and demand

Main article: Supply and demand

Prices and quantities have been described as the most directly observable attributes of goods produced and exchanged in a market economy.[33] The theory of supply and demand is an organizing principle for explaining how prices coordinate the amounts produced and consumed. In microeconomics, it applies to price and output determination for a market with perfect competition, which includes the condition of no buyers or sellers large enough to have price-setting power.

For a given market of a commodity, *demand* is the relation of the quantity that all buyers would be prepared to purchase at each unit price of the good. Demand is often represented by a table or a graph showing price and quantity demanded (as in the figure). Demand theory describes individual consumers as rationally choosing the most preferred quantity of each good, given income, prices, tastes, etc. A term for

The supply and demand model describes how prices vary as a result of a balance between product availability and demand. The graph depicts an increase (that is, right-shift) in demand from D_1 to D_2 along with the consequent increase in price and quantity required to reach a new equilibrium point on the supply curve (S).

this is "constrained utility maximization" (with income and wealth as the constraints on demand). Here, utility refers to the hypothesized relation of each individual consumer for ranking different commodity bundles as more or less preferred.

The law of demand states that, in general, price and quantity demanded in a given market are inversely related. That is, the higher the price of a product, the less of it people would be prepared to buy of it (other things unchanged). As the price of a commodity falls, consumers move toward it from relatively more expensive goods (the substitution effect). In addition, purchasing power from the price decline increases ability to buy (the income effect). Other factors can change demand; for example an increase in income will shift the demand curve for a normal good
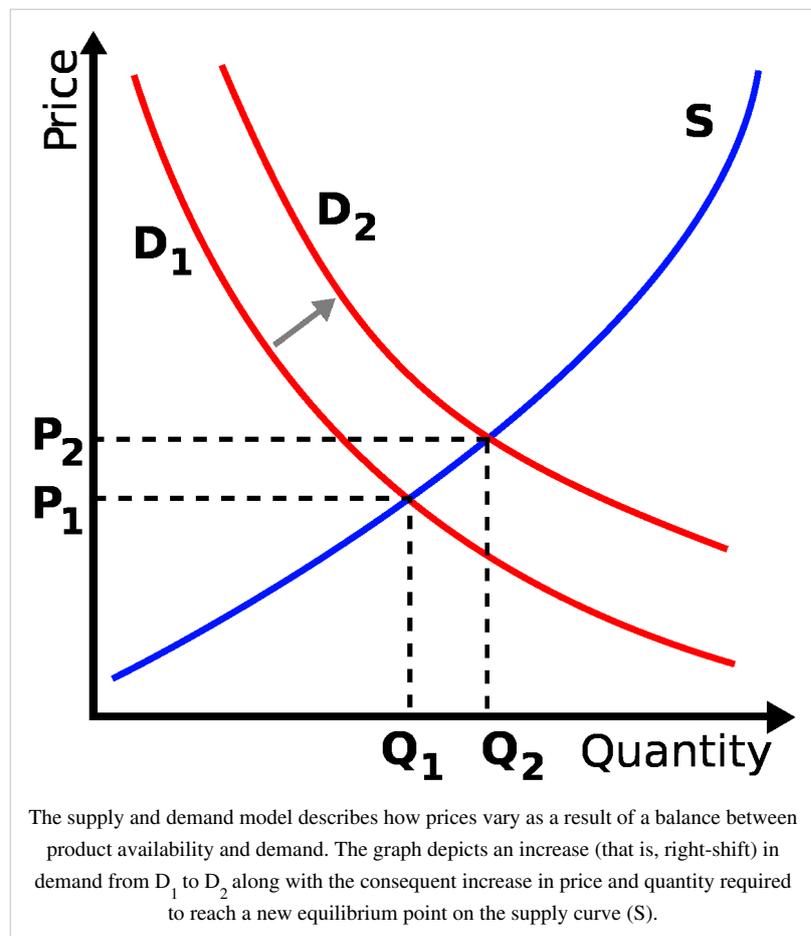
outward relative to the origin, as in the figure. All determinants are predominantly taken as constant factors of demand and supply.

Supply is the relation between the price of a good and the quantity available for sale at that price. It may be represented as a table or graph relating price and quantity supplied. Producers, for example business firms, are hypothesized to be *profit-maximizers*, meaning that they attempt to produce and supply the amount of goods that will bring them the highest profit. Supply is typically represented as a directly proportional relation between price and quantity supplied (other things unchanged).

That is, the higher the price at which the good can be sold, the more of it producers will supply, as in the figure. The higher price makes it profitable to increase production. Just as on the demand side, the position of the supply can shift, say from a change in the price of a productive input or a technical improvement. The "Law of Supply" states that, in general, a rise in price leads to an expansion in supply and a fall in price leads to a contraction in supply. Here as well, the determinants of supply, such as price of substitutes, cost of production, technology applied and various factors inputs of production are all taken to be constant for a specific time period of evaluation of supply.

Market equilibrium occurs where quantity supplied equals quantity demanded, the intersection of the supply and demand curves in the figure above. At a price below equilibrium, there is a shortage of quantity supplied compared to quantity demanded. This is posited to bid the price up. At a price above equilibrium, there is a surplus of quantity supplied compared to quantity demanded. This pushes the price down. The model of supply and demand predicts that for given supply and demand curves, price and quantity will stabilize at the price that makes quantity supplied equal to quantity demanded. Similarly, demand-and-supply theory predicts a new price-quantity combination from a shift in demand (as to the figure), or in supply.

For a given quantity of a consumer good, the point on the demand curve indicates the value, or marginal utility, to consumers for that unit. It measures what the consumer would be prepared to pay for that unit.[34] The corresponding point on the supply curve measures marginal cost, the increase in total cost to the supplier for the corresponding unit of the good. The price in equilibrium is determined by supply and demand. In a perfectly competitive market, supply and demand equate marginal cost and marginal utility at equilibrium.

On the supply side of the market, some factors of production are described as (relatively) *variable* in the short run, which affects the cost of changing output levels. Their usage rates can be changed easily, such as electrical power, raw-material inputs, and over-time and temp work. Other inputs are relatively *fixed*, such as plant and equipment and key personnel. In the long run, all inputs may be adjusted by management. These distinctions translate to differences in the elasticity (responsiveness) of the supply curve in the short and long runs and corresponding differences in the price-quantity change from a shift on the supply or demand side of the market.

Marginalist theory, such as above, describes the consumers as attempting to reach most-preferred positions, subject to income and wealth constraints while producers attempt to maximize profits subject to their own constraints, including demand for goods produced, technology, and the price of inputs. For the consumer, that point comes where marginal utility of a good, net of price, reaches zero, leaving no net gain from further consumption increases. Analogously, the producer compares marginal revenue (identical to price for the perfect competitor) against the marginal cost of a good, with *marginal profit* the difference. At the point where marginal profit reaches zero, further increases in production of the good stop. For movement to market equilibrium and for changes in equilibrium, price and quantity also change "at the margin": more-or-less of something, rather than necessarily all-or-nothing.

Other applications of demand and supply include the distribution of income among the factors of production, including labour and capital, through factor markets. In a competitive labour market for example the quantity of labour employed and the price of labour (the wage rate) depends on the demand for labour (from employers for production) and supply of labour (from potential workers). Labour economics examines the interaction of workers and employers through such markets to explain patterns and changes of wages and other labour income, labour mobility, and (un)employment, productivity through human capital, and related public-policy issues.[35]

Demand-and-supply analysis is used to explain the behavior of perfectly competitive markets, but as a standard of comparison it can be extended to any type of market. It can also be generalized to explain variables across the economy, for example, total output (estimated as real GDP) and the general price level, as studied in macroeconomics.[36] Tracing the qualitative and quantitative effects of variables that change supply and demand, whether in the short or long run, is a standard exercise in applied economics. Economic theory may also specify conditions such that supply and demand through the market is an efficient mechanism for allocating resources.[37]

Firms

Main articles: Theory of the firm, Industrial organization, Business economics and Managerial economics

People frequently do not trade directly on markets. Instead, on the supply side, they may work in and produce through *firms*. The most obvious kinds of firms are corporations, partnerships and trusts. According to Ronald Coase people begin to organise their production in firms when the costs of doing business becomes lower than doing it on the market.[38] Firms combine labour and capital, and can achieve far greater economies of scale (when the average cost per unit declines as more units are produced) than individual market trading.

In perfectly competitive markets studied in the theory of supply and demand, there are many producers, none of which significantly influence price. Industrial organization generalizes from that special case to study the strategic behavior of firms that do have significant control of price. It considers the structure of such markets and their interactions. Common market structures studied besides perfect competition include monopolistic competition, various forms of oligopoly, and monopoly.[39]

Managerial economics applies microeconomic analysis to specific decisions in business firms or other management units. It draws heavily from quantitative methods such as operations research and programming and from statistical methods such as regression analysis in the absence of certainty and perfect knowledge. A unifying theme is the attempt to optimize business decisions, including unit-cost minimization and profit maximization, given the firm's objectives and constraints imposed by technology and market conditions.[40]

Uncertainty and game theory

Main articles: Information economics, Game theory and Financial economics

Uncertainty in economics is an unknown prospect of gain or loss, whether quantifiable as risk or not. Without it, household behavior would be unaffected by uncertain employment and income prospects, financial and capital markets would reduce to exchange of a single instrument in each market period, and there would be no communications industry.[41] Given its different forms, there are various ways of representing uncertainty and modelling economic agents' responses to it.[42]

Game theory is a branch of applied mathematics that considers strategic interactions between agents, one kind of uncertainty. It provides a mathematical foundation of industrial organization, discussed above, to model different types of firm behavior, for example in an oligopolistic industry (few sellers), but equally applicable to wage negotiations, bargaining, contract design, and any situation where individual agents are few enough to have perceptible effects on each other. As a method heavily used in behavioral economics, it postulates that agents choose strategies to maximize their payoffs, given the strategies of other agents with at least partially conflicting interests.[43][44]

In this, it generalizes maximization approaches developed to analyze market actors such as in the supply and demand model and allows for incomplete information of actors. The field dates from the 1944 classic *Theory of Games and Economic Behavior* by John von Neumann and Oskar Morgenstern. It has significant applications seemingly outside of economics in such diverse subjects as formulation of nuclear strategies, ethics, political science, and evolutionary biology.[45]

Risk aversion may stimulate activity that in well-functioning markets smooths out risk and communicates information about risk, as in markets for insurance, commodity futures contracts, and financial instruments. Financial economics or simply finance describes the allocation of financial resources. It also analyzes the pricing of financial instruments, the financial structure of companies, the efficiency and fragility of financial markets,[46] financial crises, and related government policy or regulation.[47]

Some market organizations may give rise to inefficiencies associated with uncertainty. Based on George Akerlof's "Market for Lemons" article, the paradigm example is of a dodgy second-hand car market. Customers without knowledge of whether a car is a "lemon" depress its price below what a quality second-hand car would be.[48] Information asymmetry arises here, if the seller has more relevant information than the buyer but no incentive to disclose it. Related problems in insurance are adverse selection, such that those at most risk are most likely to insure (say reckless drivers), and moral hazard, such that insurance results in riskier behavior (say more reckless driving).[49]

Both problems may raise insurance costs and reduce efficiency by driving otherwise willing transactors from the market ("incomplete markets"). Moreover, attempting to reduce one problem, say adverse selection by mandating insurance, may add to another, say moral hazard. Information economics, which studies such problems, has relevance in subjects such as insurance, contract law, mechanism design, monetary economics, and health care. Applied subjects include market and legal remedies to spread or reduce risk, such as warranties, government-mandated partial insurance, restructuring or bankruptcy law, inspection, and regulation for quality and information disclosure.[50]

Market failure

Main articles: Market failure, Government failure, Information economics, Environmental economics and Agricultural economics

The term "market failure" encompasses several problems which may undermine standard economic assumptions. Although economists categorise market failures differently, the following categories emerge in the main texts.[51]

Pollution can be a simple example of market failure. If costs of production are not borne by producers but are by the environment, accident victims or others, then prices are distorted.

Information asymmetries and incomplete markets may result in economic inefficiency but also a possibility of improving efficiency through market, legal, and regulatory remedies, as discussed above.

Natural monopoly, or the overlapping concepts of "practical" and "technical" monopoly, is an extreme case of *failure of competition* as a restraint on producers. Extreme economies of scale are one possible cause.

Public goods are goods which are undersupplied in a typical market. The defining features are that people can consume public goods without having to pay for them and that more than one person can consume the good at the same time.

Externalities occur where there are significant social costs or benefits from production or consumption that are not reflected in market prices. For example, air pollution may generate a negative externality, and education may generate a positive externality (less crime, etc.). Governments often tax and otherwise restrict the sale of goods that have negative externalities and subsidize or otherwise promote the purchase of goods that have positive externalities in an effort to correct the price distortions caused by these externalities.[52] Elementary demand-and-supply theory

predicts equilibrium but not the speed of adjustment for changes of equilibrium due to a shift in demand or supply.[53]

In many areas, some form of price stickiness is postulated to account for quantities, rather than prices, adjusting in the short run to changes on the demand side or the supply side. This includes standard analysis of the business cycle in macroeconomics. Analysis often revolves around causes of such price stickiness and their implications for reaching a hypothesized long-run equilibrium. Examples of such price stickiness in particular markets include wage rates in labour markets and posted prices in markets deviating from perfect competition.

Some specialised fields of economics deal in market failure more than others. The economics of the public sector is one example. Much environmental economics concerns externalities or "public bads".

Policy options include regulations that reflect cost-benefit analysis or market solutions that change incentives, such as emission fees or redefinition of property rights.[54]

Environmental scientist sampling water

Public sector

Main articles: Economics of the public sector and Public finance

See also: Welfare economics

Public finance is the field of economics that deals with budgeting the revenues and expenditures of a public sector entity, usually government. The subject addresses such matters as tax incidence (who really pays a particular tax), cost-benefit analysis of government programs, effects on economic efficiency and income distribution of different kinds of spending and taxes, and fiscal politics. The latter, an aspect of public choice theory, models public-sector behavior analogously to microeconomics, involving interactions of self-interested voters, politicians, and bureaucrats.[55]

Much of economics is positive, seeking to describe and predict economic phenomena. Normative economics seeks to identify what economies *ought* to be like.

Welfare economics is a normative branch of economics that uses microeconomic techniques to simultaneously determine the allocative efficiency within an economy and the income distribution associated with it. It attempts to measure social welfare by examining the economic activities of the individuals that comprise society.[56]

Macroeconomics

Main article: Macroeconomics

Macroeconomics examines the economy as a whole to explain broad aggregates and their interactions "top down", that is, using a simplified form of general-equilibrium theory.[57] Such aggregates include national income and output, the unemployment rate, and price inflation and subaggregates like total consumption and investment spending and their components. It also studies effects of monetary policy and fiscal policy.

Since at least the 1960s, macroeconomics has been characterized by further integration as to micro-based modeling of sectors, including rationality of players, efficient use of market information, and imperfect competition.[58] This has addressed a long-standing concern about inconsistent developments of the same subject.[59]

Macroeconomic analysis also considers factors affecting the long-term level and growth of national income. Such factors include capital accumulation, technological change and labour force growth.[60]

The circulation of money in an economy in a macroeconomic model.

Growth

Main article: Economic growth

Growth economics studies factors that explain economic growth – the increase in output per capita of a country over a long period of time. The same factors are used to explain differences in the *level* of output per capita *between* countries, in particular why some countries grow faster than others, and whether countries converge at the same rates of growth.

Much-studied factors include the rate of investment, population growth, and technological change. These are represented in theoretical and empirical forms (as in the neoclassical and endogenous growth models) and in growth accounting.[61]
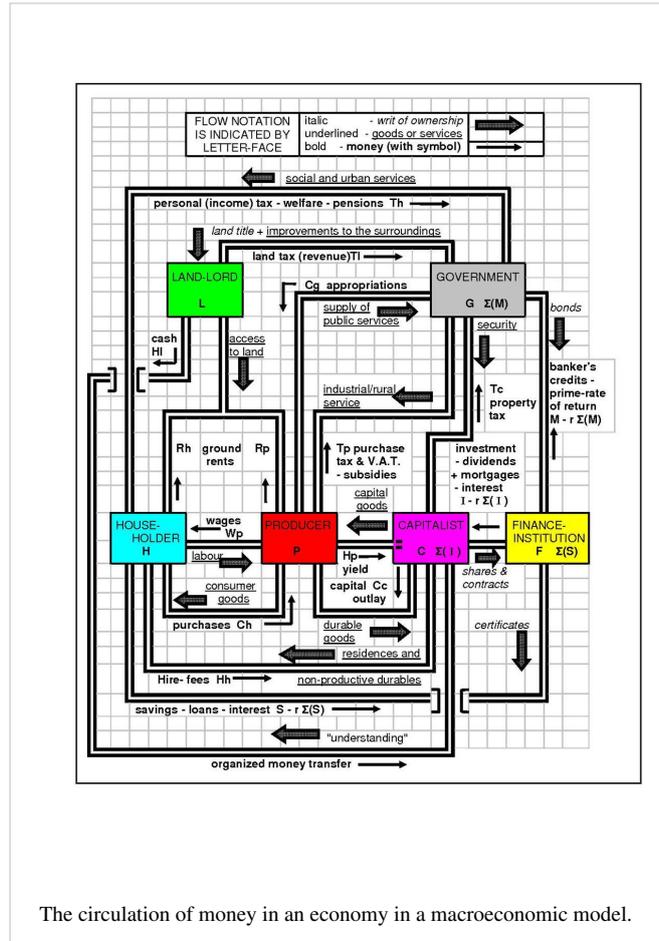
Business cycle

Main article: Business cycle

See also: Circular flow of income, Aggregate supply, Aggregate demand and Unemployment

The economics of a depression were the spur for the creation of "macroeconomics" as a separate discipline field of study. During the Great Depression of the 1930s, John Maynard Keynes authored a book entitled *The General Theory of Employment, Interest and Money* outlining the key theories of Keynesian economics. Keynes contended that aggregate demand for goods might be insufficient during economic

A basic illustration of economic/business cycles.

downturns, leading to unnecessarily high unemployment and losses of potential output.
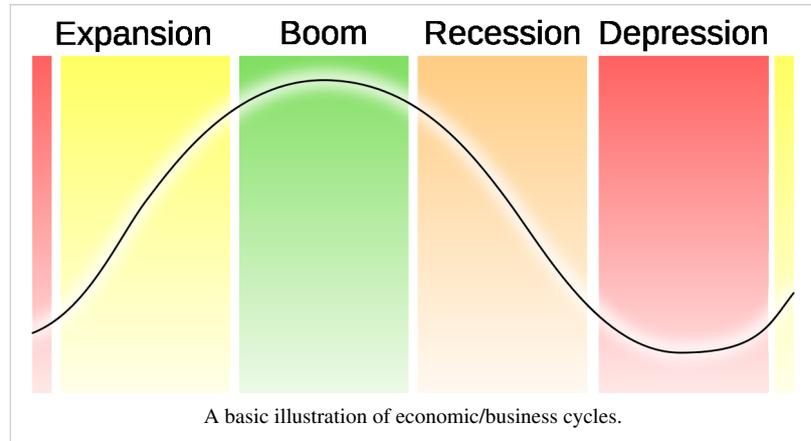
He therefore advocated active policy responses by the public sector, including monetary policy actions by the central bank and fiscal policy actions by the government to stabilize output over the business cycle. Thus, a central conclusion of Keynesian economics is that, in some situations, no strong automatic mechanism moves output and employment towards full employment levels. John Hicks' IS/LM model has been the most influential interpretation of *The General Theory*.

Over the years, understanding of the business cycle has branched into various research programs, mostly related to or distinct from Keynesianism. The neoclassical synthesis refers to the reconciliation of Keynesian economics with neoclassical economics, stating that Keynesianism is correct in the short run but qualified by neoclassical-like considerations in the intermediate and long run.[62]

New classical macroeconomics, as distinct from the Keynesian view of the business cycle, posits market clearing with imperfect information. It includes Friedman's permanent income hypothesis on consumption and "rational expectations" theory,[63] lead by Robert Lucas, and real business cycle theory.[64]

In contrast, the new Keynesian approach retains the rational expectations assumption, however it assumes a variety of market failures. In particular, New Keynesians assume prices and wages are "sticky", which means they do not adjust instantaneously to changes in economic conditions.[65]

Thus, the new classicals assume that prices and wages adjust automatically to attain full employment, whereas the new Keynesians see full employment as being automatically achieved only in the long run, and hence government and central-bank policies are needed because the "long run" may be very long.

Unemployment

Main article: Unemployment

The amount of unemployment in an economy is measured by the unemployment rate, the percentage of workers without jobs in the labour force. The labour force only includes workers actively looking for jobs. People who are retired, pursuing education, or discouraged from seeking work by a lack of job prospects are excluded from the labor force. Unemployment can be generally broken down into several types that are related to different causes.[66]

The percentage of the US population employed, 1995–2012.
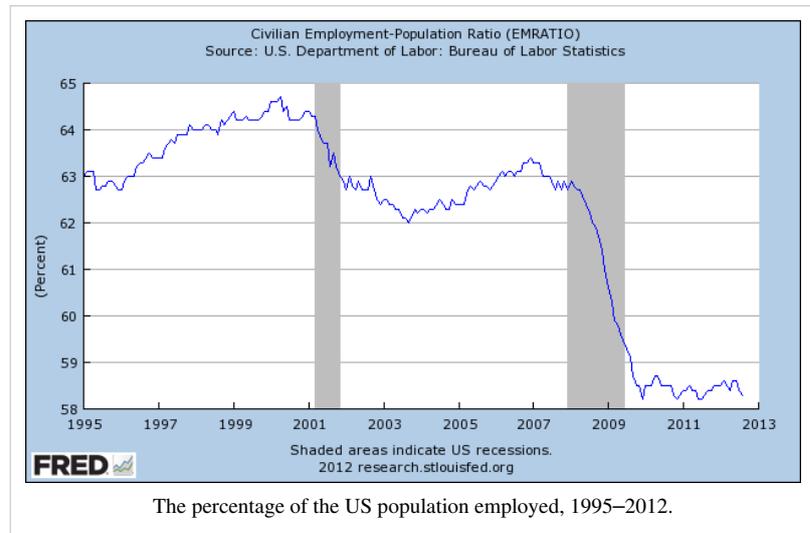
Classical models of unemployment occurs when wages are too high for employers to be willing to hire more workers. Wages may be too high because of minimum wage laws or union activity. Consistent with classical unemployment, frictional unemployment occurs when appropriate job vacancies exist for a worker, but the length of time needed to search for and find the job leads to a period of unemployment.

Structural unemployment covers a variety of possible causes of unemployment including a mismatch between workers' skills and the skills required for open jobs.[67] Large amounts of structural unemployment can occur when an economy is transitioning industries and workers find their previous set of skills are no longer in demand. Structural unemployment is similar to frictional unemployment since both reflect the problem of matching workers with job vacancies, but structural unemployment covers the time needed to acquire new skills not just the short term search process.[68]

While some types of unemployment may occur regardless of the condition of the economy, cyclical unemployment occurs when growth stagnates. Okun's law represents the empirical relationship between unemployment and economic growth.[69] The original version of Okun's law states that a 3% increase in output would lead to a 1% decrease in unemployment.[70]

Inflation and monetary policy

Main articles: Inflation and Monetary policy

See also: Money, Quantity theory of money, Monetary policy and History of money

Money is a *means of final payment* for goods in most price system economies and the unit of account in which prices are typically stated. An apt statement by Francis Amasa Walker, a well-known economist is, "Money is what money does."Wikipedia:Citation needed Money has a general acceptability, a relative consistency in value, divisibility, durability, portability, elastic in supply and survives with mass public confidence. It includes currency held by the nonbank public and checkable deposits. It has been described as a social convention, like language, useful to one largely because it is useful to others.

As a medium of exchange, money facilitates trade. It is essentially a measure of value and more importantly, a store of value being a basis for credit creation. Its economic function can be contrasted with barter (non-monetary exchange). Given a diverse array of produced goods and specialized producers, barter may entail a hard-to-locate double coincidence of wants as to what is exchanged, say apples and a book. Money can reduce the transaction cost of exchange because of its ready acceptability. Then it is less costly for the seller to accept money in exchange,

rather than what the buyer produces.[71]

At the level of an economy, theory and evidence are consistent with a positive relationship running from the total money supply to the nominal value of total output and to the general price level. For this reason, management of the money supply is a key aspect of monetary policy.[72]

Fiscal policy

Main articles: Fiscal policy and Government spending

Governments implement fiscal policy by adjusting spending and taxation policies to alter aggregate demand. When aggregate demand falls below the potential output of the economy, there is an output gap where some productive capacity is left unemployed. Governments increase spending and cut taxes to boost aggregate demand. Resources that have been idled can be used by the government.

For example, unemployed home builders can be hired to expand highways. Tax cuts allow consumers to increase their spending, which boosts aggregate demand. Both tax cuts and spending have multiplier effects where the initial increase in demand from the policy percolates through the economy and generates additional economic activity.

The effects of fiscal policy can be limited by crowding out. When there is no output gap, the economy is producing at full capacity and there are no excess productive resources. If the government increases spending in this situation, the government use resources that otherwise would have been used by the private sector, so there is no increase in overall output. Some economists think that crowding out is always an issue while others do not think it is a major issue when output is depressed.

Skeptics of fiscal policy also make the argument of Ricardian equivalence. They argue that an increase in debt will have to be paid for with future tax increases, which will cause people to reduce their consumption and save money to pay for the future tax increase. Under Ricardian equivalence, any boost in demand from fiscal policy will be offset by the increased savings rate intended to pay for future higher taxes.

International economics

Main articles: International economics and Economic system

International trade studies determinants of goods-and-services flows across international boundaries. It also concerns the size and distribution of gains from trade. Policy applications include estimating the effects of changing tariff rates and trade quotas. International finance is a macroeconomic field which examines the flow of capital across international borders, and the effects of these movements on exchange rates. Increased trade in goods, services and

A world map showing GDP (PPP) per capita, 2011.

capital between countries is a major effect of contemporary globalization.[73]

The distinct field of *development economics* examines economic aspects of the economic development process in relatively low-income countries focusing on structural change, poverty, and economic growth. Approaches in development economics frequently incorporate social and political factors.[74]

Economic systems is the branch of economics that studies the methods and institutions by which societies determine the ownership, direction, and allocation of economic resources. An *economic system* of a society is the unit of analysis.

Among contemporary systems at different ends of the organizational spectrum are socialist systems and capitalist systems, in which most production occurs in respectively state-run and private enterprises. In between are mixed economies. A common element is the interaction of economic and political influences, broadly described as political economy. *Comparative economic systems* studies the relative performance and behavior of different economies or systems.[75]

Gross Domestic Product (GDP) or Economic Growth

Main article: Gross domestic product

Gross Domestic product means the total value of goods produced and services provided in a country in a year. GDP is customarily reported on annual basis.

$$GDP = C + I + G + (X - M)$$

Practice

Main articles: Economic methodology, Mathematical economics and Schools of economics

Contemporary economics uses mathematics. Economists draw on the tools of calculus, linear algebra, statistics, game theory, and computer science.[76] Professional economists are expected to be familiar with these tools, while a minority specialize in econometrics and mathematical methods.

Theory

Mainstream economic theory relies upon a priori quantitative economic models, which employ a variety of concepts. Theory typically proceeds with an assumption of *ceteris paribus*, which means holding constant explanatory variables other than the one under consideration. When creating theories, the objective is to find ones which are at least as simple in information requirements, more precise in predictions, and more fruitful in generating additional research than prior theories.[77]

In microeconomics, principal concepts include supply and demand, marginalism, rational choice theory, opportunity cost, budget constraints, utility, and the theory of the firm.[78][79] Early macroeconomic models focused on modeling the relationships between aggregate variables, but as the relationships appeared to change over time macroeconomists, including new Keynesians, reformulated their models in microfoundations.

The aforementioned microeconomic concepts play a major part in macroeconomic models – for instance, in monetary theory, the quantity theory of money predicts that increases in the money supply increase inflation, and inflation is assumed to be influenced by rational expectations. In development economics, slower growth in developed nations has been sometimes predicted because of the declining marginal returns of investment and capital, and this has been observed in the Four Asian Tigers. Sometimes an economic hypothesis is only *qualitative*, not *quantitative*.[80]

Expositions of economic reasoning often use two-dimensional graphs to illustrate theoretical relationships. At a higher level of generality, Paul Samuelson's treatise *Foundations of Economic Analysis* (1947) used mathematical methods to represent the theory, particularly as to maximizing behavioral relations of agents reaching equilibrium. The book focused on examining the class of statements called *operationally meaningful theorems* in economics, which are theorems that can conceivably be refuted by empirical data.

Empirical investigation

Main articles: Econometrics and Experimental economics

Economic theories are frequently tested empirically, largely through the use of econometrics using economic data.[81] The controlled experiments common to the physical sciences are difficult and uncommon in economics,[82] and instead broad data is observationally studied; this type of testing is typically regarded as less rigorous than controlled experimentation, and the conclusions typically more tentative. However, the field of experimental economics is growing, and increasing use is being made of natural experiments.

Statistical methods such as regression analysis are common. Practitioners use such methods to estimate the size, economic significance, and statistical significance ("signal strength") of the hypothesized relation(s) and to adjust for noise from other variables. By such means, a hypothesis may gain acceptance, although in a probabilistic, rather than certain, sense. Acceptance is dependent upon the falsifiable hypothesis surviving tests. Use of commonly accepted methods need not produce a final conclusion or even a consensus on a particular question, given different tests, data sets, and prior beliefs.

Criticism based on professional standards and non-replicability of results serve as further checks against bias, errors, and over-generalization,[83] although much economic research has been accused of being non-replicable, and prestigious journals have been accused of not facilitating replication through the provision of the code and data. Like theories, uses of test statistics are themselves open to critical analysis,[84] although critical commentary on papers in economics in prestigious journals such as the *American Economic Review* has declined precipitously in the past 40 years. This has been attributed to journals' incentives to maximize citations in order to rank higher on the Social Science Citation Index (SSCI).

In applied economics, input-output models employing linear programming methods are quite common. Large amounts of data are run through computer programs to analyze the impact of certain policies; IMPLAN is one well-known example.

Experimental economics has promoted the use of scientifically controlled experiments. This has reduced long-noted distinction of economics from natural sciences allowed direct tests of what were previously taken as axioms.[85] In some cases these have found that the axioms are not entirely correct; for example, the ultimatum game has revealed that people reject unequal offers.

In behavioral economics, psychologist Daniel Kahneman won the Nobel Prize in economics in 2002 for his and Amos Tversky's empirical discovery of several cognitive biases and heuristics. Similar empirical testing occurs in neuroeconomics. Another example is the assumption of narrowly selfish preferences versus a model that tests for selfish, altruistic, and cooperative preferences.[86] These techniques have led some to argue that economics is a "genuine science."

Profession

Main article: Economist

The professionalization of economics, reflected in the growth of graduate programs on the subject, has been described as "the main change in economics since around 1900".[87] Most major universities and many colleges have a major, school, or department in which academic degrees are awarded in the subject, whether in the liberal arts, business, or for professional study.

In the private sector, professional economists are employed as consultants and in industry, including banking and finance. Economists also work for various government departments and agencies, for example, the national Treasury, Central Bank or Bureau of Statistics.

The Nobel Memorial Prize in Economic Sciences (commonly known as the Nobel Prize in Economics) is a prize awarded to economists each year for outstanding intellectual contributions in the field.

Related subjects

Main articles: Law and Economics, Natural resource economics, Philosophy and economics and Political economy

Economics is one social science among several and has fields bordering on other areas, including economic geography, economic history, public choice, energy economics, cultural economics, family economics and institutional economics.

Law and economics, or economic analysis of law, is an approach to legal theory that applies methods of economics to law. It includes the use of economic concepts to explain the effects of legal rules, to assess which legal rules are economically efficient, and to predict what the legal rules will be.[88] A seminal article by Ronald Coase published in 1961 suggested that well-defined property rights could overcome the problems of externalities.[89]

Political economy is the interdisciplinary study that combines economics, law, and political science in explaining how political institutions, the political environment, and the economic system (capitalist, socialist, mixed) influence each other. It studies questions such as how monopoly, rent-seeking behavior, and externalities should impact government policy.[90] Historians have employed *political economy* to explore the ways in the past that persons and groups with common economic interests have used politics to effect changes beneficial to their interests.[91]

Energy economics is a broad scientific subject area which includes topics related to energy supply and energy demand. Georgescu-Roegen reintroduced the concept of entropy in relation to economics and energy from thermodynamics, as distinguished from what he viewed as the mechanistic foundation of neoclassical economics drawn from Newtonian physics. His work contributed significantly to thermoeconomics and to ecological economics. He also did foundational work which later developed into evolutionary economics.[92]

The sociological subfield of economic sociology arose, primarily through the work of Émile Durkheim, Max Weber and Georg Simmel, as an approach to analysing the effects of economic phenomena in relation to the overarching social paradigm (i.e. modernity). Classic works include Max Weber's *The Protestant Ethic and the Spirit of Capitalism* (1905) and Georg Simmel's *The Philosophy of Money* (1900). More recently, the works of Mark Granovetter, Peter Hedstrom and Richard Swedberg have been influential in this field.

History

Main articles: History of economic thought and History of macroeconomic thought

Economic writings date from earlier Mesopotamian, Greek, Roman, Indian subcontinent, Chinese, Persian, and Arab civilizations. Notable writers from antiquity through to the 14th century include Aristotle, Xenophon, Chanakya (also known as Kautilya), Qin Shi Huang, Thomas Aquinas, and Ibn Khaldun. Joseph Schumpeter described Aquinas as "coming nearer than any other group to being the 'founders' of scientific economics" as to monetary, interest, and value theory within a natural-law perspective.[93]Wikipedia:Verifiability

Two groups, later called "mercantilists" and "physiocrats", more directly influenced the subsequent development of the subject. Both groups were associated with the rise of economic nationalism and modern capitalism in Europe. Mercantilism was an economic doctrine that flourished from the 16th to 18th century in a prolific pamphlet literature, whether of merchants or statesmen. It held that a nation's wealth depended on its accumulation of gold and silver. Nations without access to mines could obtain gold and silver from trade only by selling goods abroad and restricting imports other than of gold and silver. The doctrine called for importing cheap raw materials to be used in manufacturing goods, which could be exported,

A 1638 painting of a French seaport during the heyday of mercantilism.

and for state regulation to impose protective tariffs on foreign manufactured goods and prohibit manufacturing in the colonies.[94]

Physiocrats, a group of 18th century French thinkers and writers, developed the idea of the economy as a circular flow of income and output. Physiocrats believed that only agricultural production generated a clear surplus over cost, so that agriculture was the basis of all wealth. Thus, they opposed the mercantilist policy of promoting manufacturing and trade at the expense of agriculture, including import tariffs. Physiocrats advocated replacing administratively costly tax collections with a single tax on income of land owners. In reaction against copious mercantilist trade regulations, the physiocrats advocated a policy of laissez-faire, which called for minimal government intervention in the economy.[95]

Adam Smith (1723–1790) was an early economic theorist.[96] Smith was harshly critical of the mercantilists but described the physiocratic system "with all its imperfections" as "perhaps the purest approximation to the truth that has yet been published" on the subject.[97]

Classical political economy

Main article: Classical economics

The publication of Adam Smith's *The Wealth of Nations* in 1776, has been described as "the effective birth of economics as a separate discipline."[98] The book identified land, labor, and capital as the three factors of production and the major contributors to a nation's wealth, as distinct from the Physiocratic idea that only agriculture was productive.

Smith discusses potential benefits of specialization by division of labour, including increased labour productivity and gains from trade, whether between town and country or across countries.[99] His "theorem" that "the division of labor is limited by the extent of the market" has been described as the "core of a theory of the functions of firm and industry" and a "fundamental principle of economic organization."[100] To Smith has also been ascribed "the most important substantive proposition in all of economics" and foundation of resource-allocation theory – that, under competition, resource owners (of labour, land, and capital) seek their most profitable uses, resulting in an equal rate of return for all uses in equilibrium (adjusted for apparent differences arising from such factors as training and unemployment).[101]
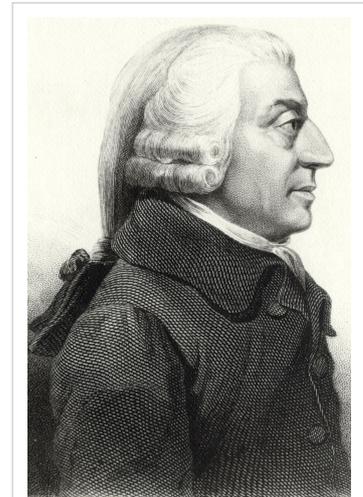
The publication of Adam Smith's *The Wealth of Nations* in 1776 is considered to be the first formalisation of economic thought.

In an argument that includes "one of the most famous passages in all economics,"[102] Smith represents every individual as trying to employ any capital they might command for their own advantage, not that of the society,[103] and for the sake of profit, which is necessary at some level for employing capital in domestic industry, and positively related to the value of produce.[104] In this:

> He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it.[105]

Economists have linked Smith's invisible-hand concept to his concern for the common man and woman through economic growth and development,[106] enabling higher levels of consumption, which Smith describes as "the sole end and purpose of all production."[107][108] He embeds the "invisible hand" in a framework that includes limiting restrictions on competition and foreign trade by government and industry in the same chapter[109] and elsewhere regulation of banking and the interest rate,[110] provision of a "natural system of liberty" — national defence, an egalitarian justice and legal system, and certain institutions and public works with general benefits to the whole society that might otherwise be unprofitable to produce, such as education[111] and roads, canals, and the like.[112][113] An influential introductory textbook includes parallel discussion and this assessment: "Above all, it is Adam Smith's vision of a self-regulating invisible hand that is his enduring contribution to modern economics."[114]

The Rev. Thomas Robert Malthus (1798) used the idea of diminishing returns to explain low living standards. Human population, he argued, tended to increase geometrically, outstripping the production of food, which increased arithmetically. The force of a rapidly growing population against a limited amount of land meant diminishing returns to labour. The result, he claimed, was chronically low wages, which prevented the standard of living for most of the population from rising above the subsistence level.[115] Economist Julian Lincoln Simon has criticised Malthus's conclusions.[116]

While Adam Smith emphasized the production of income, David Ricardo (1817) focused on the distribution of income among landowners, workers, and capitalists. Ricardo saw an inherent conflict between landowners on the one hand and labour and capital on the other. He posited that the growth of population and capital, pressing against a fixed supply of land, pushes up rents and holds down wages and profits. Ricardo was the first to state and prove the

principle of comparative advantage, according to which each country should specialize in producing and exporting goods in that it has a lower *relative* cost of production, rather relying only on its own production.[117] It has been termed a "fundamental analytical explanation" for gains from trade.[118]

Coming at the end of the Classical tradition, John Stuart Mill (1848) parted company with the earlier classical economists on the inevitability of the distribution of income produced by the market system. Mill pointed to a distinct difference between the market's two roles: allocation of resources and distribution of income. The market might be efficient in allocating resources but not in distributing income, he wrote, making it necessary for society to intervene.[119]

Value theory was important in classical theory. Smith wrote that the "real price of every thing ... is the toil and trouble of acquiring it" as influenced by its scarcity. Smith maintained that, with rent and profit, other costs besides wages also enter the price of a commodity.[120] Other classical economists presented variations on Smith, termed the 'labour theory of value'. Classical economics focused on the tendency of markets to move to long-run equilibrium.

Marxism

Main article: Marxian economics

Marxist (later, Marxian) economics descends from classical economics. It derives from the work of Karl Marx. The first volume of Marx's major work, *Das Kapital*, was published in German in 1867. In it, Marx focused on the labour theory of value and the theory of surplus value which, he believed, explained the exploitation of labour by capital.[121] The labour theory of value held that the value of an exchanged commodity was determined by the labour that went into its production and the theory of surplus value demonstrated how the workers only got paid a proportion of the value their work had created. The U.S. Export-Import Bank defines a Marxist-Lenninist state as having a centrally planned economy. They are now rare, examples can still be seen in Cuba, North Korea and Laos.[122]Wikipedia:Manual_of_Style_(dates_and_numbers)#Chronological_items
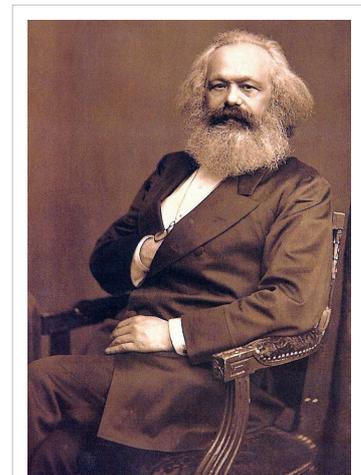
The Marxist school of economic thought comes from the work of German economist Karl Marx.

Neoclassical economics

Main article: Neoclassical economics

At the dawn as a social science, **economics** was defined and discussed at length as the study of production, distribution, and consumption of wealth by Jean-Baptiste Say in his "Treatise on Political Economy or, The Production, Distribution, and Consumption of Wealth" (1803). These three items are considered by the science only in relation to the increase or diminution of wealth, and not in reference to their processes of execution.[123] Say's definition has prevailed up to our time, saved by substituting the word "wealth" for "goods and services" meaning that wealth may include non material objects as well. One hundred and thirty years later, Lionel Robbings noticed that this definition no longer sufficed,[124] because many economists were making theoretical and philosophical inroads in other areas of human activity. Then, he proposed a definition of economics as a study of a particular aspect of human behavior, the one that falls under the influence of scarcity,[125] which forces people to choose, allocate scarce resources to competing ends, and economize (seeking the greatest welfare while avoiding the wasting of scarce resources). For Robbings, the insufficiency was solved, and his definition allows us to proclaim, with an easy conscience, education economics, safety and security economics, health economics, war economics, and of course, production, distribution and consumption economics as valid subjects of the economic science.

Citing Robbings: "Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses".[126] After discussing it for decades, Robbings's definition became widely

accepted by mainstream economists, and it has opened way into current textbooks.[127] Although far from unanimous, most mainstream economists would accept some version of Robbings' definition; even though, many have raised serious objections to the scope and method of economics, emanating from that definition.[128] Due to the lack of strong consensus, and that production, distribution and consumption of goods and services is the prime area of study of economics, the old definition still stands in many quarters.

A body of theory later termed "neoclassical economics" or "marginalism" formed from about 1870 to 1910. The term "economics" was popularized by such neoclassical economists as Alfred Marshall as a concise synonym for 'economic science' and a substitute for the earlier "political economy". This corresponded to the influence on the subject of mathematical methods used in the natural sciences.[129]

Neoclassical economics systematized supply and demand as joint determinants of price and quantity in market equilibrium, affecting both the allocation of output and the distribution of income. It dispensed with the labour theory of value inherited from classical economics in favor of a marginal utility theory of value on the demand side and a more general theory of costs on the supply side.[130] In the 20th century, neoclassical theorists moved away from an earlier notion suggesting that total utility for a society could be measured in favor of ordinal utility, which hypothesizes merely behavior-based relations across persons.[131]

In microeconomics, neoclassical economics represents incentives and costs as playing a pervasive role in shaping decision making. An immediate example of this is the consumer theory of individual demand, which isolates how prices (as costs) and income affect quantity demanded. In macroeconomics it is reflected in an early and lasting neoclassical synthesis with Keynesian macroeconomics.[132]

Neoclassical economics is occasionally referred as *orthodox economics* whether by its critics or sympathizers. Modern mainstream economics builds on neoclassical economics but with many refinements that either supplement or generalize earlier analysis, such as econometrics, game theory, analysis of market failure and imperfect competition, and the neoclassical model of economic growth for analyzing long-run variables affecting national income.

Neoclassical economics studies the behavior of individuals, households, and organizations (called economic actors, players, or agents), when they manage or use scarce resources, which have alternative uses, to achieve desired ends. Agents are assumed to act rationally, have multiple desirable ends in sight, limited resources to obtain these ends, a set of stable preferences, a definite overall guiding objective, and the capability of making a choice. There exists an economic problem, subject to study by economic science, when a decision (choice) is made by one or more resource-controlling players to attain the best possible outcome under bounded rational conditions. In other words, resource-controlling agents maximize value subject to the constraints imposed by the information the agents have, their cognitive limitations, and the finite amount of time they have to make and execute a decision. Economic science centers on the activities of the economic agents that comprise society.[133] They are the focus of economic analysis.[134]

An approach to understanding these processes, through the study of agent behavior under scarcity, may go as follows:

The continuous interplay (exchange or trade) done by economic actors in all markets sets the prices for all goods and services which, in turn, make the rational managing of scarce resources possible. At the same time, the decisions (choices) made by the same actors, while they are pursuing their own interest, determine the level of output (production), consumption, savings, and investment, in an economy, as well as the remuneration (distribution) paid to the owners of labor (in the form of wages), capital (in the form of profits) and land (in the form of rent).[135] Each period, as if they were in a giant feedback system, economic players influence the pricing processes and the economy, and are in turn influenced by them until a steady state (equilibrium) of all variables involved is reached or until an external shock throws the system toward a new equilibrium point. Because of the autonomous actions of rational interacting agents, the economy is a complex adaptive system.[136][137]

Keynesian economics

Main articles: Keynesian economics and Post-Keynesian economics

Keynesian economics derives from John Maynard Keynes, in particular his book *The General Theory of Employment, Interest and Money* (1936), which ushered in contemporary macroeconomics as a distinct field.[138] The book focused on determinants of national income in the short run when prices are relatively inflexible. Keynes attempted to explain in broad theoretical detail why high labour-market unemployment might not be self-correcting due to low "effective demand" and why even price flexibility and monetary policy might be unavailing. The term "revolutionary" has been applied to the book in its impact on economic analysis.[139]

John Maynard Keynes (right), was a key theorist in economics.

Keynesian economics has two successors. Post-Keynesian economics also concentrates on macroeconomic rigidities and adjustment processes. Research on micro foundations for their models is represented as based on real-life practices rather than simple optimizing models. It is generally associated with the University of Cambridge and the work of Joan Robinson.[140]

New-Keynesian economics is also associated with developments in the Keynesian fashion. Within this group researchers tend to share with other economists the emphasis on models employing micro foundations and optimizing behavior but with a narrower focus on standard Keynesian themes such as price and wage rigidity. These are usually made to be endogenous features of the models, rather than simply assumed as in older Keynesian-style ones.

Chicago school of economics

Main article: Chicago school (economics)

The Chicago School of economics is best known for its free market advocacy and monetarist ideas. According to Milton Friedman and monetarists, market economies are inherently stable if the money supply does not greatly expand or contract. Ben Bernanke, former Chairman of the Federal Reserve, is among the economists today generally accepting Friedman's analysis of the causes of the Great Depression.

Milton Friedman effectively took many of the basic principles set forth by Adam Smith and the classical economists and modernized them. One example of this is his article in the September 1970 issue of The New York Times Magazine, where he claims that the social responsibility of business should be "to use its resources and engage in activities designed to increase its profits ... (through) open and free competition without deception or fraud."[141]

Other schools and approaches

Main article: Schools of economics

Other well-known schools or trends of thought referring to a particular style of economics practiced at and disseminated from well-defined groups of academicians that have become known worldwide, include the Austrian School, the Freiburg School, the School of Lausanne, post-Keynesian economics and the Stockholm school. Contemporary mainstream economics is sometimes separated into the Saltwater approach of those universities along the Eastern and Western coasts of the US, and the Freshwater, or Chicago-school approach.

Within macroeconomics there is, in general order of their appearance in the literature; classical economics, Keynesian economics, the neoclassical synthesis, post-Keynesian economics, monetarism, new classical economics, and supply-side economics. Alternative developments include ecological economics, constitutional economics, institutional economics, evolutionary economics, dependency theory, structuralist economics, world systems theory, econophysics, feminist economics and biophysical economics.[142]

Criticisms

General criticisms

"The dismal science" is a derogatory alternative name for economics devised by the Victorian historian Thomas Carlyle in the 19th century. It is often stated that Carlyle gave economics the nickname "the dismal science" as a response to the late 18th century writings of The Reverend Thomas Robert Malthus, who grimly predicted that starvation would result, as projected population growth exceeded the rate of increase in the food supply. However, the actual phrase was coined by Carlyle in the context of a debate with John Stuart Mill on slavery, in which Carlyle argued for slavery, while Mill opposed it.

Some economists, like John Stuart Mill or Léon Walras, have maintained that the production of wealth should not be tied to its distribution.[143]

In *The Wealth of Nations*, Adam Smith addressed many issues that are currently also the subject of debate and dispute. Smith repeatedly attacks groups of politically aligned individuals who attempt to use their collective influence to manipulate a government into doing their bidding. In Smith's day, these were referred to as factions, but are now more commonly called special interests, a term which can comprise international bankers, corporate conglomerations, outright oligopolies, monopolies, trade unions and other groups.[144]

Economics per se, as a social science, is independent of the political acts of any government or other decision-making organization, however, many policymakers or individuals holding highly ranked positions that can influence other people's lives are known for arbitrarily using a plethora of economic concepts and rhetoric as vehicles to legitimize agendas and value systems, and do not limit their remarks to matters relevant to their responsibilities.[145] The close relation of economic theory and practice with politics[146] is a focus of contention that may shade or distort the most unpretentious original tenets of economics, and is often confused with specific social agendas and value systems.

Notwithstanding, economics legitimately has a role in informing government policy. It is, indeed, in some ways an outgrowth of the older field of political economy. Some academic economic journals are currently focusing increased efforts on gauging the consensus of economists regarding certain policy issues in hopes of effecting a more informed political environment. Currently, there exists a low approval rate from professional economists regarding many public policies. Policy issues featured in a recent survey of AEA economists include trade restrictions, social insurance for those put out of work by international competition, genetically modified foods, curbside recycling, health insurance (several questions), medical malpractice, barriers to entering the medical profession, organ donations, unhealthy foods, mortgage deductions, taxing internet sales, Wal-Mart, casinos, ethanol subsidies, and inflation targeting.[147]

In *Steady State Economics* 1977, Herman Daly argues that there exist logical inconsistencies between the emphasis placed on economic growth and the limited availability of natural resources.[148]

Issues like central bank independence, central bank policies and rhetoric in central bank governors discourse or the premises of macroeconomic policies[149] (monetary and fiscal policy) of the state, are focus of contention and criticism.[150]

Deirdre McCloskey has argued that many empirical economic studies are poorly reported, and she and Stephen Ziliak argue that although her critique has been well-received, practice has not improved. This latter contention is controversial.

A 2002 International Monetary Fund study looked at "consensus forecasts" (the forecasts of large groups of economists) that were made in advance of 60 different national recessions in the 1990s: in 97% of the cases the economists did not predict the contraction a year in advance. On those rare occasions when economists did successfully predict recessions, they significantly underestimated their severity.[151]

Criticisms of assumptions

Economics has been subject to criticism that it relies on unrealistic, unverifiable, or highly simplified assumptions, in some cases because these assumptions simplify the proofs of desired conclusions. Examples of such assumptions include perfect information, profit maximization and rational choices.[152][153] The field of information economics includes both mathematical-economical research and also behavioral economics, akin to studies in behavioral psychology.

Nevertheless, prominent mainstream economists such as Keynes and Joskow have observed that much of economics is conceptual rather than quantitative, and difficult to model and formalize quantitatively. In a discussion on oligopoly research, Paul Joskow pointed out in 1975 that in practice, serious students of actual economies tended to use "informal models" based upon qualitative factors specific to particular industries. Joskow had a strong feeling that the important work in oligopoly was done through informal observations while formal models were "trotted out *ex post*". He argued that formal models were largely not important in the empirical work, either, and that the fundamental factor behind the theory of the firm, behavior, was neglected.

In recent years, feminist critiques of neoclassical economic models gained prominence, leading to the formation of feminist economics.[154] Contrary to common conceptions of economics as a positive and objective science, feminist economists call attention to the social construction of economics[155] and highlight the ways in which its models and methods reflect masculine preferences. Primary criticisms focus on failures to account for: the selfish nature of actors (homo economicus); exogenous tastes; the impossibility of utility comparisons; the exclusion of unpaid work; and the exclusion of class and gender considerations. Feminist economics developed to address these concerns, and the field now includes critical examinations of many areas of economics including paid and unpaid work, economic epistemology and history, globalization, household economics and the care economy. In 1988, Marilyn Waring published the book *If Women Counted*, in which she argues that the discipline of economics ignores women's unpaid work and the value of nature;[156] according to Julie A. Nelson, *If Women Counted* "showed exactly how the unpaid work traditionally done by women has been made invisible within national accounting systems" and "issued a wake-up call to issues of ecological sustainability." Bjørnholt and McKay argue that the financial crisis of 2007–08 and the response to it revealed a crisis of ideas in mainstream economics and within the economics profession, and call for a reshaping of both the economy, economic theory and the economics profession. They argue that such a reshaping should include new advances within feminist economics that take as their starting point the socially responsible, sensible and accountable subject in creating an economy and economic theories that fully acknowledge care for each other as well as the planet.

Philip Mirowski observes that

> The imperatives of the orthodox research programme [of economic science] leave little room for maneuver and less room for originality. ... These mandates ... Appropriate as many mathematical techniques and metaphorical expressions from contemporary respectable science, primarily physics as possible. ... Preserve to the maximum extent possible the attendant nineteenth-century overtones of "natural order" ... Deny strenuously that neoclassical theory slavishly imitates physics. ... Above all, prevent all rival research programmes from encroaching ... by ridiculing all external attempts to appropriate twentieth century physics models. ... All theorizing is [in this way] held hostage to nineteenth-century concepts of energy.[157]

In a series of peer-reviewed journal and conference papers and books published over a period of several decades, John McMurtry[158] has provided extensive criticism of what he terms the "unexamined assumptions and implications [of economics], and their consequent cost to people's lives."[159]

Nassim Nicholas Taleb and Michael Perelman are two additional scholars who criticized conventional or mainstream economics. Taleb opposes most economic theorizing, which in his view suffers acutely from the problem of overuse of Plato's Theory of Forms, and calls for cancellation of the Nobel Memorial Prize in Economics, saying that the damage from economic theories can be devastating.[160] Michael Perelman provides extensive criticism of economics and its assumptions in all his books (and especially his books published from 2000 to date), papers and

interviews.

Despite these concerns, mainstream graduate programs have become increasingly technical and mathematical.[161]

References

[1] http://en.wikipedia.org/w/index.php?title=Template:Economics_sidebar&action=edit

[2] • Marshall, Alfred, and Mary Paley Marshall (1879). *The Economics of Industry*, Macmillan, p. 2. (http://books.google.com/books?id=wFc4yr9xfqAC&printsec=find&pg=PA2#v=onepage&q&f=false)
   • Jevons, W. Stanley (1879). *The Theory of Political Economy*, 2nd ed., Macmillan. p. xiv (http://books.google.com/books?id=aYcBAAAAQAAJ&printsec=find&pg=PR14#v=onepage&q&f=false).

[3] Andrew Caplin and Andrew Schotter, *The Foundations of Positive and Normative Economics*, Oxford University Press, 2008, ISBN 0-19-532831-0

[4] Davis, John B. (2006). "Heterodox Economics, the Fragmentation of the Mainstream, and Embedded Individual Analysis", in *Future Directions in Heterodox Economics*. Ann Arbor: University of Michigan Press.

[5] Friedman, David D. (2002). "Crime," (http://www.econlib.org/LIBRARY/Enc/Crime.html) *The Concise Encyclopedia of Economics.'.'* Retrieved October 21, 2007.

[6] The World Bank (2007). "Economics of Education." (http://go.worldbank.org/78EK1G87M0). Retrieved October 21, 2007.

[7] Iannaccone, Laurence R. (1998). "Introduction to the Economics of Religion", *Journal of Economic Literature*, 36(3), pp. 1465−1495. (http://webcache.googleusercontent.com/search?q=cache:kzBioz_tiS8J:www.religionomics.com/old/erel/S2-Archives/Iannaccone%20-%20Introduction%20to%20the%20Economics%20of%20Religion.pdf+"Introduction+to+the+Economics+of+Religion"&hl=en&ct=clnk&cd=1&gl=us).

[8] Nordhaus, William D. (2002). "The Economic Consequences of a War with Iraq", in *War with Iraq: Costs, Consequences, and Alternatives*, pp. 51−85. (http://nordhaus.econ.yale.edu/AAAS_War_Iraq_2.pdf) American Academy of Arts and Sciences. Cambridge, Massachusetts. Retrieved October 21, 2007.

[9] Arthur M. Diamond, Jr. (2008). "science, economics of", *The New Palgrave Dictionary of Economics*, 2nd Edition, Basingstoke and New York: Palgrave Macmillan. Pre-publication http://archive.is/20120927155248/http://cba.unomaha.edu/faculty/adiamond/web/diamondpdfs/palgraveeconsci07.pdf cached ccpy.]

[10] • Lazear, Edward P. (2000|. "Economic Imperialism", *Quarterly Journal Economics*, 115(1)|, p. 99 (http://www.jstor.org/pss/2586936)−146. Cached copy. (http://66.102.1.104/scholar?hl=en&lr=&q=cache:fD0VzttXRUMJ:flash.lakeheadu.ca/~kyu/E5111/Lazear2000.pdf+) Pre-publication copy (http://66.102.1.104/scholar?hl=en&lr=&q=cache:lK_6EHxTuCoJ:faculty-gsb.stanford.edu/lazear/personal/PDFs/economic%20imperialism.pdf+)(larger print.)
   • Becker, Gary S. (1976). *The Economic Approach to Human Behavior*. Links (http://books.google.com/books?id=iwEOFKSKbMgC&dq="The+Economic+Approach+to+Human+Behavior"+Introduction&lr=&source=gbs_summary_s&cad=0) to arrow-page viewable chapter. University of Chicago Press.

[11] • Backhouse, Roger E., and Steven Medema (2008). "economics, definition of", *The New Palgrave Dictionary of Economics*, 2nd Edition, pp. 720−22. Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_E000291&q=definitions&topicid=&result_number=5)
   • _____ (2009). "Retrospectives: On the Definition of Economics", *Journal of Economic Perspectives*, 23(1), pp. 221−33 (http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.23.1.221).

[12] Smith, Adam (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations*, and Book IV, as quoted in Peter Groenwegen (1987) [2008]), "'political economy' and 'economics'", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 904−07 (brief link (http://www.dictionaryofeconomics.com/search_results?q="political+economy+and+economics"+Groenewegen&edition=current&button_search=GO)).

[13] Say, Jean-Baptiste (1803). *A Treatise on Political Economy; or the Production, Distribution, and Consumption of Wealth*, trans. 1834, C. C. Biddle, ed., Grigg and Elliot.

[14] • [Carlyle, Thomas] (1849). "Occasional Discourse on the N[egro] Question", *Fraser's Magazine*, republished in *Works of Thomas Carlyle*, 1904, v. 29, Charles Scribner's Sons, pp. 348−383.
   • Malthus, Thomas (1798). *An Essay on the Principle of Population.*
   • Persky, Joseph (1990). "Retrospectives: A Dismal Romantic", *Journal of Economic Perspectives*, 4(4), pp. 166−169 [pp. 165 (http://www.jstor.org/pss/1942728)-172].

[15] Mill, John Stuart (1844). "On the Definition of Political Economy; and on the Method of Investigation Proper to It", Essay V (http://www.econlib.org/library/Mill/mlUQP5.html), in *Essays on Some Unsettled Questions of Political Economy* (V39). (Accessed Nov 2011)

[16] Marshall, Alfred (1890 [1920]). *Principles of Political Economy*, v. 1, pp. 1−2 [8th ed.]. London: Macmillan.

[17] Backhouse, Roger E., and Steven Medema (2009). "Retrospectives: On the Definition of Economics", *Journal of Economic Perspectives*, 23(1), p. 225. [pp. 221−33. (http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.23.1.221)

[18] Robbins, Lionel (1932). *An Essay on the Nature and Significance of Economic Science*, p. 15 (http://books.google.com/books?id=nySoIkOgWQ4C&printsec=find&pg=PA15#v=onepage&q&f=false). London: Macmillan. Links for 1932 HTML (http://books.google.com/books?id=nySoIkOgWQ4C&printsec=find&pg=PR10#v=onepage&q&f=false) and 2nd ed., 1935 facsimile (http://www.

scribd.com/doc/14242989/An-Essay-on-the-Nature-and-Signicance-of-Economic-Science-Lionel-Robbins-).

[19] Robbins, Lionel (1932). *An Essay on the Nature and Significance of Economic Science*, p. 16 (http://books.google.com/ books?id=nySoIkOgWQ4C&printsec=find&pg=PA16#v=onepage&q&f=false).

[20] Robbins, Lionel (1932), pp 4 to 7

[21] • Backhouse, Roger E., and Steven G. Medema (2009). "Defining Economics: The Long Road to Acceptance of the Robbins Definition", *Economica*, 76(302), V. Economics Spreads Its Wings (http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0335.2009.00789.x/ full#ss4). [Pp. 805–820 (http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0335.2009.00789.x/full).]
       • Stigler, George J. (1984). "Economics—The Imperial Science?" *Scandinavian Journal of Economics*, 86(3), pp. 301 (http://www.jstor. org/pss/3439864)-313.

[22] Blaug, Mark (2007). "The Social Sciences: Economics", *The New Encyclopædia Britannica*, v. 27, p. 343 [pp. 343–52].

[23] Becker, Gary S. (1976). *The Economic Approach to Human Behavior*, Chicago, p. 5 (http://books.google.com/ books?id=iwEOFKSKbMgC&printsec=fnd&pg=PA5=gbs_v2_summary_r&cad=0#v=onepage&q&f=false).

[24] Backhouse, Roger E., and Steven Medema (2009). "Retrospectives: On the Definition of Economics", *Journal of Economic Perspectives*, 23(1), p. 229, Introduction, and Conclusion [pp. 221–33 (http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.23.1.221).]

[25] • Blaug, Mark (2007). "The Social Sciences: Economics", Microeconomics, *The New Encyclopædia Britannica*, v. 27, pp. 347–49. Chicago. ISBN 0-85229-423-9
       • Varian, Hal R. (1987). "microeconomics", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 461–63. London and New York: Macmillan and Stockton.ISBN 0-333-37235-2

[26] Buchanan, James M. (1987). "opportunity cost", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 718–21.

[27] *The Economist, Economics A-Z,* "Opportunity Cost." (http://www.economist.com/research/Economics/searchActionTerms. cfm?query=OPPORTUNITY+COST) Accessed 3 Aug. 2010

[28] Montani, Guido (1987), "scarcity", The New Palgrave: A Dictionary of Economics, v. 4, p. 254.

[29] Krugman, Paul R. (1980). "Scale Economies, Product Differentiation, and the Pattern of Trade", *American Economic Review*, 70(5), pp. 950–59. (http://www.princeton.edu/~pkrugman/scale_econ.pdf)
       • William C. Strange, 2008, "urban agglomeration", *The New Palgrave Dictionary of Economics*, 2nd Edition. Abstract. (http://www. dictionaryofeconomics.com/article?id=pde2008_U000064&q=agglomeration&topicid=&result_number=1)

[30] • Groenewegen, Peter (2008). "division of labour", *The New Palgrave Dictionary of Economics*. Abstract. (http://www. dictionaryofeconomics.com/article?id=pde2008_D000176&edition=current&q=division of labour&topicid=&result_number=1)
       • Johnson, Paul M. (2005). "Specialization," (http://www.auburn.edu/~johnspm/gloss/specialization) *A Glossary of Political Economy Terms*.
       • Yang, Xiaokai, and Yew-Kwang Ng (1993). *Specialization and Economic Organization*. Description. (http://books.google.com/ books?id=xuG4AAAAIAAJ&q="Specialization+and+Economic+Organization."&dq="Specialization+and+Economic+Organization."& hl=en&ei=1ZxZTN_nMMKgnAeOjaWKCQ&sa=X&oi=book_result&ct=result&resnum=1&ved=0CCkQ6AEwAA) Amsterdam: North-Holland.

[31] Cameron, Rondo (1993, 2nd ed.). *A Concise Economic History of the World: From Paleolithic Times to the Present, Oxford, pp. 25, 32, 276–80.*

[32] • Samuelson, Paul A., and William D. Nordhaus (2004). *Economics*,ch. 2, "Trade, Specialization, and Division of Labor" section, ch. 12, 15, "Comparative Advantage among Nations" section", "Glossary of Terms", Gains from trade.
       • Findlay, Ronald (2008). "comparative advantage", *The New Palgrave Dictionary of Economics*. Abstract. (http://www. dictionaryofeconomics.com/article?id=pde2008_C000254&edition=current&q=comparative advantage&topicid=&result_number=1)
       • Kemp, Murray C. (1987). "gains from trade", *The New Palgrave: A Dictionary of Economics*, v. 2, pp. 453–54.

[33] Brody, A. (1987). "prices and quantities", *The New Palgrave: A Dictionary of Economics*, v. 3, p. 957.

[34] Baumol, William J. (2007). "Economic Theory", Measurement and ordinal utility, *The New Encyclopædia Britannica*, v. 17, p. 719.

[35] Freeman, R.B. (1987). "labour economics", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 72–76.
       • Taber, Christopher, and Bruce A. Weinberg (2008). "labour economics (new perspectives)", *The New Palgrave Dictionary of Economics*, 2nd Edition, Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_L000241&q=labor economics&topicid=& result_number=14)
       • Hicks, J.R. (1963, 2nd ed.). *The Theory of Wages*. London: Macmillan.

[36] Blanchard, Olivier (2006, 4th ed.). *Macroeconomics*, ch. 7, "Putting All Markets Together: The AS–AD Model", Prentice-Hall.

[37] Jordan, J.S. (1982). "The Competitive Allocation Process Is Informationally Efficient Uniquely." *Journal of Economic Theory*, 28(1), p. 1–18.

[38] Coase, *The Nature of the Firm* (1937)

[39] Schmalensee, Richard (1987). "Industrial Organization", *The New Palgrave: A Dictionary of Economics*, v. 2, pp. 803–808.

[40] • NA (2007). "managerial economics".
       • Hughes, Alan (1987). "managerial capitalism", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 293–96.

[41] Machina, Mark J. and Michael Rothschild (2008). "risk", *The New Palgrave Dictionary of Economics*, 2nd Edition. Abstract. (http://www. dictionaryofeconomics.com/article?id=pde2008_R000152&edition=current&q=risk&topicid=&result_number=2)

[42] Wakker, Peter P. (2008) "uncertainty", *The New Palgrave Dictionary of Economics*, 2nd Edition. Abstract. (http://www. dictionaryofeconomics.com/article?id=pde2008_U000005&edition=current&q=Uncertainty&topicid=&result_number=2)

[43] Samuelson, Paul A., and William D. Nordhaus (2004). *Economics*, 18th ed., ch. 11, "Uncertainty and Game Theory" and [end] Glossary of Terms, "Economics of information", "Game theory", and "Regulation."

[44] Colin F. Camerer (2003). *Behavioral Game Theory* Description (http://press.princeton.edu/chapters/i7517.html) and ch. 1 link (http://press.princeton.edu/chapters/i7517.pdf) (scroll down). Princeton.

[45] Aumann, R.J. (2008). "game theory", *The New Palgrave Dictionary of Economics*. Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_G000007&edition=current&q=game theory&topicid=&result_number=4)

[46] Bernanke, Ben and Mark Gertler (1990). "Financial Fragility and Economic Performance", *Quarterly Journal of Economics*, 105(1), p p. 87 (http://www.jstor.org/pss/2937820)-114.

[47] From (2008), *The New Palgrave Dictionary of Economics*, 2nd Edition:
   • Ross, Stephen A. "finance." Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_F000071&edition=current&q=Finance&topicid=&result_number=2)
   • Burnside, Craig, Martin Eichenbaum, and Sergio Rebelo. "currency crises models." Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_S000204&edition=current&q=crisis&topicid=&result_number=7)
   • Kaminsky, Graciela Laura. "currency crises." Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_C000468&edition=current&q=crisis&topicid=&result_number=10)
   • Calomiris, Charles W. "banking crises." Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_B000051&edition=current&q=crisis&topicid=&result_number=18)

[48] Akerlof, George A. (1970). "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism", *Quarterly Journal of Economics*, 84(3), pp. 488–500. (http://hydrogen.its.ucdavis.edu/eec/education/EEC-classes/eeclimate/class-readings/akerlof-the market for lemons.pdf)

[49] Lippman, S.S., and J.J. McCall (2001). "Information, Economics of", *International Encyclopedia of the Social & Behavioral Sciences*, pp. 7480–7486.

[50] From (2008), *The New Palgrave Dictionary of Economics*, 2nd Edition:
   • Wilson, Charles. "adverse selection", Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_A000040&edition=current&q=adverse selection&topicid=&result_number=1)
   • Kotowitz, Y. "moral hazard." TOC. (http://www.dictionaryofeconomics.com/article?id=pde2008_M000259&edition=current&q=moral&topicid=&result_number=3)
   • Myerson, Roger B. "revelation principle." Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_R000137&edition=current&q=moral&topicid=&result_number=1)

[51] • Cf. Nicholas Barr (2004), whose list of market failures is melded with failures of economic assumptions, which are (1) producers as price takers (i.e. presence of oligopoly or monopoly; but why is this not a product of the following?) (2) equal power of consumers (what labour lawyers call an imbalance of bargaining power) (3) complete markets (4) public goods (5) external effects (i.e. externalities?) (6) increasing returns to scale (i.e. practical monopoly) (7) perfect information [in his *Economics of the Welfare State*, 4th ed., Oxford University Press, pp. 72–79].
   • Joseph E. Stiglitz (2000) classifies market failures as from failure of competition (including natural monopoly), information asymmetries, incomplete markets, externalities, public good situations, and macroeconomic disturbances (in his *Economics of the Public Sector*, 3rd ed., Ch.4, W.W. Norton).

[52] Laffont, J.J. (1987). "externalities", *The New Palgrave: A Dictionary of Economics*, v. 2, p. 263–65.

[53] Blaug, Mark (2007). "The Social Sciences: Economics". *The New Encyclopædia Britannica* v. 27, p. 347. Chicago. ISBN 0-85229-423-9

[54] • Kneese, Allen K., and Clifford S. Russell (1987). "environmental economics", *The New Palgrave: A Dictionary of Economics*, v. 2, pp. 159–64.
   • Samuelson, Paul A., and William D. Nordhaus (2004). *Economics*, ch. 18, "Protecting the Environment." McGraw-Hill.

[55] Musgrave, R.A. (1987). "public finance", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 1055–60.

[56] Feldman, Allan M. (1987). "welfare economics", *The New Palgrave: A Dictionary of Economics*, v. 4, pp. 889–95.

[57] Blaug, Mark (2007). "The Social Sciences: Economics", *The New Encyclopædia Britannica*, v. 27, p. 345.

[58] Ng, Yew-Kwang (1992). "Business Confidence and Depression Prevention: A Mesoeconomic Perspective", *American Economic Review* 82(2), pp. 365–371. (http://links.jstor.org/sici?sici=0002-8282(199205)82:2<365:BCADPA>2.0.CO;2-4&size=LARGE&origin=JSTOR-enlargePage)

[59] Howitt, Peter M. (1987). "Macroeconomics: Relations with Microeconomics".

[60] Blaug, Mark (2007). "The Social Sciences: Economics", Macroeconomics, *The New Encyclopædia Britannica*, v. 27, p. 349.

[61] • Samuelson, Paul A., and William D. Nordhaus (2004). *Economics*, ch. 27, "The Process of Economic Growth" McGraw-Hill. ISBN 0-07-287205-5.
   • Uzawa, H. (1987). "models of growth", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 483–89.

[62] Blanchard, Olivier Jean ([1987] 2008), "neoclassical synthesis," *The New Palgrave Dictionary of Economics*, 2nd Edition. Abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_N000041&q=neoclassical&topicid=&result_number=2)

[63] The Macroeconomist as Scientist and Engineer (http://www.economics.harvard.edu/files/faculty/40_Macroeconomist_as_Scientist.pdf), Gregory Mankiw, Harvard University, May 2006.

[64] Fischer, Stanley (2008). "new classical macroeconomics," *The New Palgrave Dictionary of Economics*, 2nd Edition. Contents (http://www.dictionaryofeconomics.com/article?id=pde2008_N000056&edition=current&q=).

[65] Dixon, Huw David (2008). "new Keynesian macroeconomics," *The New Palgrave Dictionary of Economics*, 2nd Edition. Abstract (http://www.dictionaryofeconomics.com/article?id=pde2008_N000166&edition=current&q=).

[66] Dwivedi, 443.

[67] Freeman (2008). http://www.dictionaryofeconomics.com/article?id=pde2008_S000311.

[68] Dwivedi, 444-445.

[69] Dwivedi, 445-446.

[70] Neely, Christopher J. "Okun's Law: Output and Unemployment. *Economic Synopses*. Number 4. 2010. http://research.stlouisfed.org/publications/es/10/ES1004.pdf.

[71] Tobin, James (1992). "Money" (Money as a Social Institution and Public Good), *The New Palgrave Dictionary of Finance and Money*, v. 2, pp. 770−71.

[72] • Milton Friedman (1987). "quantity theory of money", *The New Palgrave: A Dictionary of Economics*, v. 4, pp. 15−19.
     • Samuelson, Paul A., and William D. Nordhaus (2004). *Economics*, ch. 2, "Money: The Lubroicant of Exchange" section, ch. 33, Fig. 33−3.

[73] • Anderson, James E. (2008). "international trade theory", *The New Palgrave Dictionary of Economics, 2nd Edition. Abstract.* (http://www.dictionaryofeconomics.com/article?id=pde2008_I000263&q=international economics&topicid=&result_number=14)
     • *Venables, A. (2001), "international trade: economic integration",* International Encyclopedia of the Social & Behavioral Sciences*, pp. 7843−7848.*
     • *Obstfeld, Maurice (2008). "international finance",* The New Palgrave Dictionary of Economics, 2nd Edition*. Abstract.* (http://www.dictionaryofeconomics.com/article?id=pde2008_I000169&q=international finance&topicid=&result_number=1)

[74] • Bell, Clive (1987). "development economics", *The New Palgrave: A Dictionary of Economics*, v. 1, pp. 818−26.
     • Blaug, Mark (2007). "The Social Sciences: Economics", Growth and development, *The New Encyclopædia Britannica*, v. 27, p. 351. Chicago.

[75] • Heilbroner, Robert L. and Peter J. Boettke (2007). "Economic Systems", *The New Encyclopædia Britannica*, v. 17, pp. 908−15.
     • NA (2007). "economic system", *Encyclopædia Britannica online* Concise Encyclopedia entry. (http://www.britannica.com/ebc/article-9363397)

[76] Debreu, Gérard (1987). "mathematical economics", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 401−03.

[77] Friedman Milton (1953). "The Methodology of Positive Economics", *Essays in Positive Economics*, University of Chicago Press, p. 10.

[78] Boland, Lawrence A. (1987). "methodology", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 455−58.

[79] Accessed on 2007-03-17.

[80] Quirk, James (1987). "qualitative economics", *The New Palgrave: A Dictionary of Economics*, v. 4, pp. 1−3.

[81] Hashem, M. Pesaren (1987). "econometrics", The New Palgrave: A Dictionary of Economics, v. 2, p. 8.

[82] Probability, econometrics and truth: the methodology of econometrics By Hugo A. Keuzenkamp Published by Cambridge University Press, 2000 ISBN 0-521-55359-8, ISBN 978-0-521-55359-9 312 pages, page 13: "...in economics, controlled experiments are rare and reproducible controlled experiments even more so..."

[83] Blaug, Mark (2007). "The Social Sciences: Economics" (Methods of inference and Testing theories), *The New Encyclopædia Britannica*, v. 27, p. 347.

[84] • Kennedy, Peter (2003). *A Guide to Econometrics*, 5th ed., "21.2 The Ten Commandments of Applied Econometrics", pp. 390−96 (excerpts). (http://books.google.com/books?hl=en&lr=&id=B8I5SP69e4kC&oi=fnd&pg=PR11&ots=w8xiZdkYWb&sig=_YKfXmJbK4-F3H4zsMl8N-U5BGo#PRA1-PA390,M1)
     • McCloskey, Deirdre N. and Stephen T. Ziliak (1996). "The Standard Error of Regressions", *Journal of Economic Literature*, 34(1), pp. 97−114. (http://www.deirdremccloskey.com/docs/pdf/Article_189.pdf)
     • Hoover, Kevin D., and Mark V. Siegler (2008). "Sound and Fury: McCloskey and Significance Testing in Economics", *Journal of Economic Methodology*, 15(1), pp. 1−37 (2005 prepubication version). (http://129.3.20.41/econ-wp/em/papers/0511/0511018.pdf) Reply of McCloskey and Ziliak and rejoinder, pp. 39−68.

[85] • [Bastable, C.F.] (1925). "experimental methods in economics", *Palgrave's Dictionary of Economics*, reprinted in *The New Palgrave: A Dictionary of Economics* (1987, v. 2, p. 241.
     • Smith, Vernon L. (1987), "experimental methods in economics", ii. *The New Palgrave: A Dictionary of Economics*, v. 2, pp. 241−42.

[86] • Fehr, Ernst, and Urs Fischbacher (2003). "The Nature of Human Altruism", *Nature* 425, October 23, pp. 785−791. (http://www.kabbalah.info/forums/arosa/engmaterials/Altruism/Ernst_Fehr___Urs_Fischbacher__The_Nature_of_Human_Altruism.pdf)
     • Sigmund, Karl, Ernst Fehr, and Martin A. Nowak (2002),"The Economics of Fair Play", *Scientific American*, 286(1) January, pp. 82−87. (http://www.scribd.com/word/full/2188440?access_key=key-2ejknqyx744p0e6mcc21)

[87] O. Ashenfelter (2001), "Economics: Overview", The Profession of Economics, *International Encyclopedia of the Social & Behavioral Sciences*, v. 6, p. 4159.

[88] • Friedman, David (1987). "law and economics", *The New Palgrave: A Dictionary of Economics*, v. 3, p. 144.
     • Posner, Richard A. (1972). *Economic Analysis of Law*. Aspen, 7th ed., 2007) ISBN 978-0-7355-6354-4.

[89] Coase, Ronald, "The Problem of Social Cost", *The Journal of Law and Economics* Vol.3, No.1 (1960). This issue was actually published in 1961.

[90] • Groenewegen, Peter (2008). "'political economy'", *The New Palgrave Dictionary of Economics*.
     • Krueger, Anne O. (1974)."The Political Economy of the Rent-Seeking Society", *American Economic Review*, 64(3), pp.291−303

[91] McCoy, Drew R. "The Elusive Republic: Political Ecocomy in Jeffersonian America", Chapel Hill, University of North Carolina, 1980.

[92] • Cleveland, C. and Ruth, M. 1997. When, where, and by how much do biophysical limits constrain the economic process? A survey of Georgescu-Roegen's contribution to ecological economics. *Ecological Economics* 22: 203–223.
      • Daly, H. 1995. "On Nicholas Georgescu-Roegen's Contributions to Economics: An Obituary essay." *Ecological Economics* 13: 149–54.
      • Mayumi, K. 1995. Nicholas Georgescu-Roegen (1906–1994): an admirable epistemologist. *Structural Change and Economic Dynamics* 6: 115–120.
      • Mayumi, K. and Gowdy, J. M. (eds.) 1999. *Bioeconomics and Sustainability: Essays in Honor of Nicholas Georgescu-Roegen*. Cheltenham: Edward Elgar.
      • Mayumi, K. 2001. *The Origins of Ecological Economics: The Bioeconomics of Georgescu-Roegen*. London: Routledge.

[93] Schumpeter, Joseph A. (1954). *History of Economic Analysis*, pp. 97–115. Oxford.

[94] • NA (2007). "mercantilism",
      • Blaug, Mark (2007). "The Social Sciences: Economics". *The New Encyclopædia Britannica*, v. 27, p. 343.

[95] NA (2007). "physiocrat",
      • Blaug, Mark (1997, 5th ed.) *Economic Theory in Retrospect*, pp, 24–29, 82–84. Cambridge.

[96] E. K. Hunt (2002). *History of Economic Thought: A Critical Perspective* (http://books.google.com/books?id=duYaugxYHdIC&pg=PA3&dq&hl=en#v=onepage&q=&f=false), p.3. ISBN 0-7656-0606-2

[97] " *The making of modern economics: the lives and ideas of the great thinkers* (http://books.google.com/books?id=QV2OJqbt45oC&pg=PA36&dq&hl=en#v=onepage&q=&f=false)". Mark Skousen (2001). p.36. ISBN 0-7656-0479-5

[98] Blaug, Mark (2007). "The Social Sciences: Economics". *The New Encyclopædia Britannica*, v. 27, p. 343.

[99] Deardorff, Alan V., 2006. *Glossary of International Economics*, Division of labor (http://www-personal.umich.edu/~alandear/glossary/d.html#DivisionOfLabor).

[100] Stigler, George J. (1951). "The Division of Labor Is Limited by the Extent of the Market." *Journal of Political Economy*, 59(3), pp. 185–193. (http://www.sfu.ca/~allen/stigler.pdf)

[101] Stigler, George J. (1976). "The Successes and Failures of Professor Smith", *Journal of Political Economy*, 84(6), p. 1202 (pp. 1199 (http://www.jstor.org/pss/1831274)-1213). Also published as Selected Papers, No. 50 (PDF) (http://testwww.chicagobooth.edu/research/selectedpapers/sp50c.pdf), Graduate School of Business, University of Chicago.

[102] Samuelson, Paul A., and William D. Nordhaus (2004). *Economics*. 18th ed., McGraw-Hill, ch. 2, "Markets and Government in a Modern Economy", The Invisible Hand, p. 30.

[103] 'Capital' in Smith's usage includes fixed capital and circulating capital. The latter includes wages and labour maintenance, money, and inputs from land, mines, and fisheries associated with production per *The Wealth of Nations*, Bk. II: ch. 1, 2, and 5 (http://www.econlib.org/cgi-bin/searchbooks.pl?searchtype=BookSearchPara&pgct=1&sortby=R&searchfield=F&id=10&query="circulating+capital"+wages&x=0&y=0&andor=and).

[104] Smith, Adam (1776). *The Wealth of Nations*, Bk. IV: Of Systems of political Œconomy, ch. II, "Of Restraints upon the Importation from Foreign Countries of such Goods as can be Produced at Home", para. 3-5 and 8-9 (http://www.econlib.org/library/Smith/smWN13.html#IV.2.3).

[105] Smith, Adam (1776). *The Wealth of Nations*, Bk. IV: Of Systems of political Œconomy, ch. II, "Of Restraints upon the Importation from Foreign Countries of such Goods as can be Produced at Home", para. 9 (http://www.econlib.org/library/Smith/smWN13.html#IV.2.9).

[106] Smith, Adam (1776). *The Wealth of Nations*, Bk. I-IV and Bk. I, ch. 1, para. 10 (http://www.econlib.org/cgi-bin/searchbooks.pl?searchtype=BookSearchPara&pgct=1&sortby=R&searchfield=F&id=10&query="in+a+well-governed+society"+"universal+opulence"+"extends+itself+to+the+lowest+ranks+of+the+people"&andor=and).

[107] • Smith, Adam (1776). *The Wealth of Nations*, Bk. IV, ch. 8, para. 49 (http://www.econlib.org/cgi-bin/searchbooks.pl?searchtype=BookSearchPara&pgct=1&sortby=R&searchfield=F&id=10&query="the+sole+end+and+purpose+of+all+production"&x=0&y=0&andor=and).

[108] • Samuelson, Paul A., and William D. Nordhaus (2004). *Economics*. 18th ed., McGraw-Hill, ch. 2, "Markets and Government in a Modern Economy", The Invisible Hand, p. 30.
      • Blaug, Mark (2008). "invisible hand", *The New Palgrave Dictionary of Economics*, 2nd Edition, v. 4, pp. 564–66. Abstract (http://www.dictionaryofeconomics.com/article?id=pde2008_I000220&edition=current&q=Invisible hand&topicid=&result_number=1).

[109] Smith, Adam (1776). *The Wealth of Nations*, Bk. IV: Of Systems of political Œconomy, ch. II (http://www.econlib.org/library/Smith/smWN13.html#B.IV), "Of Restraints upon the Importation from Foreign Countries."

[110] Smith, Adam (1776). *The Wealth of Nations*, Bk. II, ch. II, para. 94 (http://www.econlib.org/cgi-bin/searchbooks.pl?searchtype=BookSearchPara&id=smWN&query="regulations+of+the+banking+trade") and Bk. II, ch. IV, para. 15 (http://www.econlib.org/cgi-bin/searchbooks.pl?searchtype=BookSearchPara&pgct=1&sortby=R&searchfield=F&id=10&query="sober+people"+"rate+of+interest"&x=16&y=11&andor=and).

[111] Smith, Adam (1776). *The Wealth of Nations*, Bk. V, ch. I, para. 180-85 (http://www.econlib.org/library/Smith/smWN20.html#V.1.180) and 239 and 240 (http://www.econlib.org/library/Smith/smWN20.html#V.1.239).

[112] • Smith, Adam (1776). *The Wealth of Nations*, Bk. V, ch. I, para. 64 (http://www.econlib.org/cgi-bin/searchbooks.pl?searchtype=BookSearchPara&id=smWN&query=contract+law+justice) and Bk. IV: Of Systems of political Œconomy, ch. IX, para. 51 (http://www.econlib.org/cgi-bin/searchbooks.pl?searchtype=BookSearchPara&pgct=1&sortby=R&searchfield=F&id=10&query="system+of+natural+liberty"&x=0&y=0&andor=and) and Bk. V: ch. 1 (http://www.econlib.org/library/Smith/smWN20.html#B.V,), "Of the Expences of the Sovereign or Commonwealth", para. 71 and 76 (http://www.econlib.org/cgi-bin/searchbooks.

pl?searchtype=BookSearchPara&pgct=1&sortby=R&searchfield=F&id=10&query=roads,+bridges,+canals&x=15&y=12&andor=and), and 239-40 (http://www.econlib.org/library/Smith/smWN20.html#V.1.239).

[113] • Blaug, Mark (2007). "The Social Sciences: Economics", *The New Encyclopædia Britannica*, v. 27, Analysis of the market, pp. 343–44.

   • _____ (1997). *Economic Theory in Retrospect*, 5th ed., in ch. 2, sect. 19, "Adam Smith as an Economist, pp. 56–62. (http://books.google. com/books?id=4nd6alor2goC&printsec=find&pg=PA56=gbs_atb#v=onepage&q&f=false)

   • Vaughn, Karen I. (1987), "invisible hand", *The New Palgrave: A Dictionary of Economics*, v. 2, pp. 997–99. Link (http://www. dictionaryofeconomics.com/search_results?q=Invisible+hand+metaphor+twice+&field=content&edition=archive&topicid=).

   • Skinner, Andrew (2008). "Smith, Adam (1723–1790)", Policy, *The New Palgrave Dictionary of Economics*, 2nd Edition, v. 7, pp. 559–61. Abstract (http://www.dictionaryofeconomics.com/article?id=pde2008_S000154&edition=current&q=Adam Smith&topicid=& result_number=1).

   • Viner, Jacob (1927). "Adam Smith and Laissez Faire", sect. IV. Flaws in the Natural Order, pp. 214–17, and V. The Functions of Government, *Journal of Political Economy*, 35(2), pp. 217–32 (pp. 198 (http://www.jstor.org/pss/1823421)-232).

[114] Samuelson, Paul A., William D. Nordhaus (2004). *Economics*. 18th ed., McGraw-Hill, ch. 2, "Markets and Government in a Modern Economy", Not Chaos, but Economic Order (and following, pp. 26–29; The Invisible Hand (including discussion of market failure and public goods), pp. 30–31.

[115] [Malthus, Thomas] (1798). *An Essay on the Principle of Population.*

[116] Simon J.L. 1981. *The ultimate resource*; and 1992 *The ultimate resource II.*

[117] David Ricardo, 1817. *On the Principles of Political Economy and Taxation.*

[118] Ronald Findlay, 2008. "comparative advantage", *The New Palgrave Dictionary of Economics*, 2nd Edition, 1st paragraph. Abstract (http:// www.dictionaryofeconomics.com/article?id=pde2008_C000254&edition=current&q=comparative advantage&topicid=& result_number=1).

[119] Mill, John Stuart (1848, 1871, 7th ed.). *Principles of Political Economy.*

[120] Smith, Adam (1776). The Wealth of Nations (http://www.bartleby.com/10/105.html/), Bk. 1, Ch. 5, 6.

[121] • Roemer, J.E. (1987). "Marxian value analysis". *The New Palgrave: A Dictionary of Economics*, v. 3, 383.

   • Mandel, Ernest (1987). "Marx, Karl Heinrich", *The New Palgrave: A Dictionary of Economicsv. 3, pp. 372, 376.*

[122] von Brabant, Jozef M. *The Planned Economies and International Economic Organizations*, Cambridge University Press, 1991, p. 16

[123] "This science indicates the cases in which commerce is truly productive, where whatever is gained by one is lost by another, and where it is profitable to all; it also teaches us to appreciate its several processes, but simply in their results, at which it stops. Besides this knowledge, the merchant must also understand the processes of his art. He must be acquainted with the commodities in which he deals, their qualities and defects, the countries from which they are derived, their markets, the means of their transportation, the values to be given for them in exchange, and the method of keeping accounts. The same remark is applicable to the agriculturist, to the manufacturer, and to the practical man of business; to acquire a thorough knowledge of the causes and consequences of each phenomenon, the study of political economy is essentially necessary to them all; and to become expert in his particular pursuit, each one must add thereto a knowledge of its processes."

[124] "And when we submit the definition in question to this test, it is seen to possess deficiencies which, so far from being marginal and subsidiary, amount to nothing less than a complete failure to exhibit either the scope or the significance of the most central generalisations of all." Robbings, Lionel (1935). "An Essay on the Nature and Significance of Economic Science". Great Britain: Macmillan and Co., Limited. p. 5.

[125] "The conception we have adopted may be described as analytical. It does not attempt to pick out certain kinds of behaviour, but focuses attention on a particular aspect of behaviour, the form imposed by the influence of scarcity. Robbings ibid, p. 17.

[126] Robbings ibid, p. 16

[127] Defining Economics: the Long Road to Acceptance of the Robbins Definition, Roger E. Backhouse and Steven G. Medema, "Lionel Robbins's essay on the Nature and Significance of Economic Science", 75th anniversary conference proceedings, p. 215; http://darp.lse.ac. uk/papersdb/LionelRobbinsConferenceProveedingsVolume.pdf

[128] "There remained division over whether economics was defined by a method or a subject matter but both sides in that debate could increasingly accept some version of the Robbins definition". Roger E. Backhouse and Steven G. Medema, ibid, p. 223

[129] Clark, Barry (1998). *Political Economy: A Comparative Approach*, Praeger.

[130] Campos, Antonietta (1987). "marginalist economics", *The New Palgrave: A Dictionary of Economics*, v. 3, p. 320

[131] R.D. Collison Black (1987 [2008])). "utility", *The New Palgrave: A Dictionary of Economics*, v. 3, p. 778.

[132] Hicks, J.R. (1937). "Mr. Keynes and the 'Classics': A Suggested Interpretation", *Econometrica*, 5(2), p p. 147–159 (http://links.jstor.org/ sici?sici=0012-9682(193704)5:2<147:MKAT"A>2.0.CO;2-E&size=LARGE&origin=JSTOR-enlargePage).

[133] See LEIGH TESFATSION: Agent-Based Computational Economics: Growing Economies from the Bottom Up, ISU Economics Working Paper No. 1, 15 March 2002 http://www2.econ.iastate.edu/tesfatsi/acealife.pdf

[134] Agent-based computational economics

[135] Interest payments are considered a form of rent on credit money

[136] Complex adaptive system

[137] Dynamic network analysis

[138] •

   • Blaug, Mark (2007). "The Social Sciences: Economics", *The New Encyclopædia Britannica*, v. 27, p. 347. Chicago.

[139] • Tarshis, L. (1987). "Keynesian Revolution", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 47–50.
   • Samuelson, Paul A., and William D. Nordhaus (2004). *Economics*, p. 5.
   • Blaug, Mark (2007). "The Social Sciences: Economics", *The New Encyclopædia Britannica*, v. 27, p. 346. Chicago.

[140] Harcourt, G.C.(1987). "Post-Keynesian Economics", *The New Palgrave: A Dictionary of Economics*, v. 3, pp. 47–50.

[141] Friedman, Milton. "The Social Responsibility of Business is to Increase its Profits." The New York Times Magazine 13 Sep. 1970.

[142] New School of Thought Brings Energy to 'the Dismal Science' (http://www.nytimes.com/gwire/2009/10/23/23greenwire-new-school-of-thought-brings-energy-to-the-dis-63367.html?pagewanted=all) New York Times Retrieved Oct-26-09

[143] *The Origin of Economic Ideas*, Guy Routh (1989)

[144] See Noam Chomsky (*Understanding Power*), (http://www.understandingpower.com/Chapter5.htm#f1) on Smith's emphasis on class conflict in the Wealth of Nations

[145] Sara Ledwith and Antonella Ciancio, Special Report: Crisis forces "dismal science" to get real (http://www.reuters.com/article/2012/07/03/us-europe-economics-teaching-idUSBRE86207O20120703), Reuters (July 3, 2012)

[146] Research Paper No. 2006/148 Ethics, Rhetoric and Politics of Post-conflict Reconstruction How Can the Concept of Social ContractHelp Us in Understanding How to Make Peace Work? Sirkku K. Hellsten, pg. 13 (http://www.wider.unu.edu/publications/rps/rps2006/rp2006-148.pdf)

[147] Whaples, Robert. "The Policy Views of American Economic Association Members: The Results of a New Survey". *Econ Journal Watch* 6(3): 337–348. (http://econjwatch.org/articles/the-policy-views-of-american-economic-association-members-the-results-of-a-new-survey)

[148] Steady-State Economics (http://dieoff.org/page88.htm), by Herman Daly

[149] Johan Scholvinck, Director of the UN Division for Social Policy and Development in New York, Making the Case for the Integration of Social and Economic Policy (http://www.icsw.org/publications/sdr/2002-june/un-division.htm), The Social Development Review

[150] • Bernd Hayo (Georgetown University & University of Bonn), Do We Really Need Central Bank Independence? A Critical Re-examination (http://ideas.repec.org/p/wpa/wuwpma/0103006.html), IDEAS at the Department of Economics, College of Liberal Arts and Sciences, University of Connecticut
   • Gabriel Mangano (Centre Walras-Pareto, University of Lausanne BFSH 1, 1015 Lausanne, Switzerland, and London School of Economics), Measuring Central Bank Independence: A Tale of Subjectivity and of Its Consequences, Oxford Economic Papers. 1998; 50: 468–492.
   • Friedrich Heinemann, Does it Pay to Watch Central Bankers' Lips? The Information Content of ECB Wording (http://ideas.repec.org/p/zbw/zewdip/4553.html), IDEAS at the Department of Economics, College of Liberal Arts and Sciences, University of Connecticut
   • Stephen G. Cecchetti, Central Bank Policy Rules: Conceptual Issues and Practical Considerations (http://ideas.repec.org/p/nbr/nberwo/6306.html), IDEAS at the Department of Economics, College of Liberal Arts and Sciences, University of Connecticut

[151] "How Accurate Are Private Sector Forecasts? Cross-Country Evidence from Consensus Forecasts of Output Growth", by Prakash Loungani, International Monetary Fund (IMF), December 2002

[152] Rappaport, Steven (1996). "Abstraction and Unrealistic Assumptions in Economics", *Journal of Economic Methodology*, 3(2), pp. 215–236. Abstract, (http://www.informaworld.com/smpp/content~content=a739439848~db=all) (1998). *Models and Reality in Economics*. Edward Elgar, p. 6, ch. 6–8.

[153] Friedman, Milton (1953), "The Methodology of Positive Economics", *Essays in Positive Economics*, University of Chicago Press, pp. 14–15, 22, 31.
   • Boland, Lawrence A. (2008). "assumptions controversy", *The New Palgrave Dictionary of Economics, 2nd Edition* Online abstract. (http://www.dictionaryofeconomics.com/article?id=pde2008_A000231&q=assumption&topicid=&result_number=1) Accessed May 30, 2008.

[154] England, Paula (1993). "The Separative Self: Androcentric Bias in Neoclassical Assumptions", *Beyond Economic Man: Feminist Theory and Economics*, University of Chicago Press, pp. 37–53.

[155] Ferber, M.A. and Julie A. Nelson, "*Beyond Economic Man*: Ten Years Later," in Marianne A. Ferber and Julie A. Nelson, eds., *Feminist Economics Today: Beyond Economic Man*. Chicago: University of Chicago Press, 2003.

[156] Marilyn Waring (1988.) *If Women Counted*. San Francisco: Harper & Row. ISBN 0-06-250933-0

[157] Philip Mirowski, More Heat Than Light: Economics as Social Physics (http://www.amazon.com/More-Heat-than-Light-Perspectives/product-reviews/0521426898/ref=dp_top_cm_cr_acr_txt?ie=UTF8&showViewpoints=1). New York: Cambridge University Press, 1989, pp. 377–8.

[158] Please see partial list of publications, including peer-reviewed papers and books, on John McMurtry's wikipedia page, as well as links to the text of several of his peer-reviewed papers and peer-reviewed secondary references analyzing and discussing his work.

[159] John McMurtry, The Cancer Stage of Capitalism. London, Pluto Books, 1999. The book is a scholarly examination and criticism of economics. The book is available for free download from several sites online, for example here (http://www.jaunimieciai.lt/wp-content/uploads/2011/02/the-cancer-stage-of-capitalism.pdf). (In April 2012, the author stated he is working on an updated edition.)

[160] Cox, Adam. "Blame Nobel for crisis, says author of 'Black Swan'" (http://www.reuters.com/article/idUSTRE68R2SK20100928), Reuters (2010-09-28).

[161] Sutter, Daniel, and Rex Pjesky (2007). "Where Would Adam Smith Publish Today? The Near Absence of Math-free Research in Top Journals," *Econ Journal Watch*, 4(2), pp. 230-240. Abstract. (http://econjwatch.org/articles/where-would-adam-smith-publish-today-the-near-absence-of-math-free-research-in-top-journals) Retrieved 2013-04-04.

Further reading

- McCann, Charles Robert, Jr., 2003. *The Elgar Dictionary of Economic Quotations*, Edward Elgar. Preview (http:/ /books.google.com/books?id=fFnV_Jg9LJIC&printsec=frontcover&source=gbs_v2_summary_r& cad=0#v=onepage&q&f=false).

External links

a multilingual free encyclopedia **Wiktionary** [ˈwɪkʃənri] *n.*, a wiki-based Open Content dictionary Wilkəʃ'ne'l keᵊ	Look up *economics* in Wiktionary, the free dictionary.

⊕	Wikiversity has learning materials about *School:Economics*
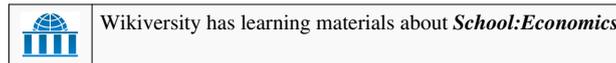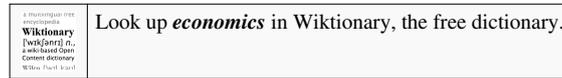
Library resources about **Economics**
• Resources in your library (http://tools.wmflabs.org/ftl/cgi-bin/ftl?st=wp&su=Economics)

General information

- Economics (http://www.dmoz.org/Science/Social_Sciences/Economics/) at DMOZ
- Economic journals on the web (http://www.oswego.edu/~economic/journals.htm)
- Economics (http://www.britannica.com/eb/article-9109547/economics) at *Encyclopædia Britannica*
- Intute: Economics (http://www.intute.ac.uk/socialsciences/economics/): Internet directory of UK universities
- Research Papers in Economics (RePEc) (http://repec.org/)
- Resources For Economists (http://rfe.org/): American Economic Association-sponsored guide to 2,000+ Internet resources from "Data" to "Neat Stuff", updated quarterly.

Institutions and organizations

- Economics Departments, Institutes and Research Centers in the World (http://edirc.repec.org/)
- Organization For Co-operation and Economic Development (OECD) Statistics (http://www.oecd.org/statistics/)
- United Nations Statistics Division (http://unstats.un.org/unsd)
- World Bank Data (http://data.worldbank.org/)

Study resources

- A guide to several online economics textbooks (http://www.oswego.edu/~economic/newbooks.htm)
- Economics at About.com (http://economics.about.com/)
- Economics textbooks on Wikibooks
- Introduction to Economics (http://www.econguru.com/introduction_to_economics/): Short Creative commons-licensed introduction to basic economics
- MERLOT Learning Materials: Economics (http://www.merlot.org/merlot/materials.htm?category=2216): US-based database of learning materials
- MIT OpenCourseWare: Economics (http://ocw.mit.edu/OcwWeb/Economics/index.htm): Archive of study materials from MIT courses
- Online Learning and Teaching Materials (http://www.economicsnetwork.ac.uk/links/othertl.htm) UK Economics Network's database of text, slides, glossaries and other resources
- Schools of Thought (http://homepage.newschool.edu/het/thought.htm): Compare various economic schools of thought on particular issues

- The Library of Economics and Liberty (Econlib) (http://www.econlib.org/): Economics Books, Articles, Blog (EconLog), Podcasts (EconTalk)

Cost accounting

Accounting
• **Historical cost accounting** • **Constant purchasing power accounting** • **Management accounting** • **Tax accounting**
Business portal
• v • t • e [1]

Cost accounting is a process of collecting, analyzing, summarizing and evaluating various alternative courses of action. Its goal is to advise the management on the most appropriate course of action based on the cost efficiency and capability. Cost accounting provides the detailed cost information that management needs to control current operations and plan for the future.

Since managers are making decisions only for their own organization, there is no need for the information to be comparable to similar information from other organizations. Instead, information must be relevant for a particular environment. Cost accounting information is commonly used in financial accounting information, but its primary function is for use by managers to facilitate making decisions.

Unlike the accounting systems that help in the preparation of financial reports periodically, the cost accounting systems and reports are not subject to rules and standards like the Generally Accepted Accounting Principles. As a result, there is wide variety in the cost accounting systems of the different companies and sometimes even in different parts of the same company or organization.

Origins

All types of businesses, whether service, manufacturing or trading, require cost accounting to track their activities. Cost accounting has long been used to help managers understand the costs of running a business. Modern cost accounting originated during the industrial revolution, when the complexities of running a large scale business led to the development of systems for recording and tracking costs to help business owners and managers make decisions.

In the early industrial age, most of the costs incurred by a business were what modern accountants call "variable costs" because they varied directly with the amount of production.Wikipedia:Citation needed Money was spent on labor, raw materials, power to run a factory, etc. in direct proportion to production. Managers could simply total the variable costs for a product and use this as a rough guide for decision-making processes.

Some costs tend to remain the same even during busy periods, unlike variable costs, which rise and fall with volume of work. Over time, these "fixed costs" have become more important to managers. Examples of fixed costs include

the depreciation of plant and equipment, and the cost of departments such as maintenance, tooling, production control, purchasing, quality control, storage and handling, plant supervision and engineering.[1] In the early nineteenth century, these costs were of little importance to most businesses. However, with the growth of railroads, steel and large scale manufacturing, by the late nineteenth century these costs were often more important than the variable cost of a product, and allocating them to a broad range of products lead to bad decision making. Managers must understand fixed costs in order to make decisions about products and pricing.

For example: A company produced railway coaches and had only one product. To make each coach, the company needed to purchase $60 of raw materials and components, and pay 6 laborers $40 each. Therefore, total variable cost for each coach was $300. Knowing that making a coach required spending $300, managers knew they couldn't sell below that price without losing money on each coach. Any price above $300 became a contribution to the fixed costs of the company. If the fixed costs were, say, $1000 per month for rent, insurance and owner's salary, the company could therefore sell 5 coaches per month for a total of $3000 (priced at $600 each), or 10 coaches for a total of $4500 (priced at $450 each), and make a profit of $500 in both cases.

Cost Accounting vs Financial Accounting

See also: Financial accounting

- Financial accounting aims at finding out results of accounting year in the form of Profit and Loss Account and Balance Sheet. Cost Accounting aims at computing cost of production/service in a scientific manner and facilitate cost control and cost reduction.
- Financial accounting reports the results and position of business to government, creditors, investors, and external parties.
- Cost Accounting is an internal reporting system for an organization's own management for decision making.
- In financial accounting, cost classification based on type of transactions, e.g. salaries, repairs, insurance, stores etc. In cost accounting, classification is basically on the basis of functions, activities, products, process and on internal planning and control and information needs of the organization.
- Financial accounting aims at presenting 'true and fair' view of transactions, profit and loss for a period and Statement of financial position (Balance Sheet) on a given date. It aims at computing 'true and fair' view of the cost of production/services offered by the firm.

Types of cost accounting

The Following are different Cost Accounting Approaches:

- standardized or standard cost accounting
- lean accounting
- activity-based costing
- resource consumption accounting
- throughput accounting
- Life cycle costing
- environmental accounting
- Target costing

Elements of cost

Basic cost elements are:

1. Raw materials
2. Labor
3. expenses/overhead

*   Material (Material is a very important part of business)
    *   Direct material/Indirect material
*   Labor
    *   Direct labor/Indirect labor
*   Overhead (Variable/Fixed)
    *   Production or works overheads
    *   Administration overheads
    *   Selling overheads
    *   Distribution overheads
    *   Maintenance & Repair
    *   Supplies
    *   Utilities
    *   Other Variable Expenses
    *   Salaries
    *   Occupancy (Rent)
    *   Depreciation
    *   Other Fixed Expenses

(In some companies, machine cost is segregated from overhead and reported as a separate element)

Classification of costs

Classification of cost means, the grouping of costs according to their common characteristics. The important ways of classification of costs are:

1. By Element: There are three elements of costing i.e. material, labor and expenses.
2. By Nature or Traceability:Direct Costs and Indirect Costs. Direct Costs are Directly attributable/traceable to Cost Object. Direct costs are assigned to Cost Object. Indirect Costs are not directly attributable/traceable to Cost Object. Indirect costs are allocated or apportioned to cost objects.
3. By Functions: production,administration, selling and distribution, R&D.
4. By Behavior: fixed, variable, semi-variable. Costs are classified according to their behavior in relation to change in relation to production volume within given period of time. Fixed Costs remain fixed irrespective of changes in the production volume in given period of time. Variable costs change according to volume of production. Semi-variable Costs costs are partly fixed and partly variable.
5. By control ability: controllable, uncontrollable costs. Controllable costs are those which can be controlled or influenced by a conscious management action. Uncontrollable costs cannot be controlled or influenced by a conscious management action.
6. By normality: normal costs and abnormal costs. Normal costs arise during routine day-to-day business operations. Abnormal costs arise because of any abnormal activity or event not part of routine business operations. E.g. costs arising of floods, riots, accidents etc.
7. By Time: Historical Costs and Predetermined costs. Historical costs are costs incurred in the past. Predetermined costs are computed in advance on basis of factors affecting cost elements. Example: Standard Costs.
8. By Decision making Costs: These costs are used for managerial decision making.

- Marginal Costs: Marginal cost is the change in the aggregate costs due to change in the volume of output by one unit.
- Differential Costs: This cost is the difference in total cost that will arise from the selection of one alternative to the other.
- Opportunity Costs: It is the value of benefit sacrificed in favor of an alternative course of action.
- Relevant Cost: The relevant cost is a cost which is relevant in various decisions of management.
- Replacement Cost: This cost is the cost at which existing items of material or fixed assets can be replaced. Thus this is the cost of replacing existing assets at present or at a future date.
- Shutdown Cost:These costs are the costs which are incurred if the operations are shut down and they will disappear if the operations are continued.
- Capacity Cost: These costs are normally fixed costs. The cost incurred by a company for providing production, administration and selling and distribution capabilities in order to perform various functions.
- Other Costs

Standard cost accounting

In modern cost account of recording historical costs was taken further, by allocating the company's fixed costs over a given period of time to the items produced during that period, and recording the result as the total cost of production. This allowed the *full cost* of products that were not sold in the period they were produced to be recorded in inventory using a variety of complex accounting methods, which was consistent with the principles of GAAP (Generally Accepted Accounting Principles). It also essentially enabled managers to ignore the fixed costs, and look at the results of each period in relation to the "standard cost" for any given product.

> For example: if the railway coach company normally produced 40 coaches per month, and the fixed costs were still $1000/month, then each coach could be said to incur an Operating Cost/overhead of $25 =($1000 / 40). Adding this to the variable costs of $300 per coach produced a full cost of $325 per coach.

This method tended to slightly distort the resulting unit cost, but in mass-production industries that made one product line, and where the fixed costs were relatively low, the distortion was very minor.

> For example: if the railway coach company made 100 coaches one month, then the unit cost would become $310 per coach ($300 + ($1000 / 100)). If the next month the company made 50 coaches, then the unit cost = $320 per coach ($300 + ($1000 / 50)), a relatively minor difference.

An important part of standard cost accounting is a variance analysis, which breaks down the variation between actual cost and standard costs into various components (volume variation, material cost variation, labor cost variation, etc.) so managers can understand *why costs were different from what was planned* and take appropriate action to correct the situation.

The development of throughput accounting

Main article: Throughput accounting

As business became more complex and began producing a greater variety of products, the use of cost accounting to make decisions to maximize profitability came into question. Management circles became increasingly aware of the Theory of Constraints in the 1980s, and began to understand that "every production process has a limiting factor" somewhere in the chain of production. As business management learned to identify the constraints, they increasingly adopted throughput accounting to manage them and "maximize the *throughput dollars*" (or other currency) from each unit of constrained resource. Throughput accounting aims to make the best use of scarce resources(bottle neck) in a JIT environment.[2]

Mathematical formula

$$\text{throughput} = \text{sales revenue} - \text{direct material costs}$$

$$\text{throughput accounting ratio} = \frac{\text{return}}{\text{factory hours}}$$

$$textrm(arkansas/,kansas) = Frac$$

Activity-based costing

Main article: Activity-based costing

Activity-based costing (ABC) is a system for assigning costs to products based on the activities they require. In this case, activities are those regular actions performed inside a company.[3] "Talking with customer regarding invoice questions" is an example of an activity inside most companies.

Companies may be moved to adopt ABC by a need to improve costing accuracy, that is, understand better the true costs and profitability of individual products, services, or initiatives. ABC gets closer to true costs in these areas by turning many costs that standard cost accounting views as indirect costs essentially into direct costs. By contrast, standard cost accounting typically determines so-called indirect and overhead costs simply as a percentage of certain direct costs, which may or may not reflect actual resource usage for individual items.

Under ABC, accountants assign 100% of each employee's time to the different activities performed inside a company (many will use surveys to have the workers themselves assign their time to the different activities). The accountant then can determine the total cost spent on each activity by summing up the percentage of each worker's salary spent on that activity.

A company can use the resulting activity cost data to determine where to focus their operational improvements. For example, a job-based manufacturer may find that a high percentage of its workers are spending their time trying to figure out a hastily written customer order. Via ABC, the accountants now have a currency amount pegged to the activity of "Researching Customer Work Order Specifications". Senior management can now decide how much focus or money to budget for resolving this process deficiency. Activity-based management includes (but is not restricted to) the use of activity-based costing to manage a business.

While ABC may be able to pinpoint the cost of each activity and resources into the ultimate product, the process could be tedious, costly and subject to errors.

As it is a tool for a more accurate way of allocating fixed costs into product, these fixed costs do not vary according to each month's production volume. For example, an elimination of one product would not eliminate the overhead or even direct labor cost assigned to it. ABC better identifies product costing in the long run, but may not be too helpful in day-to-day decision-making.

Integrating EVA and Process Based Costing

Recently, Mocciaro Li Destri, Picone & Minà (2012).[4] proposed a performance and cost measurement system that integrates the Economic Value Added criteria with Process Based Costing (PBC). The EVA-PBC methodology allows us to implement the EVA management logic not only at the firm level, but also at lower levels of the organization. EVA-PBC methodology plays an interesting role in bringing strategy back into financial performance measures.

Lean accounting

Main article: Lean accounting

Lean accounting has developed in recent years to provide the accounting, control, and measurement methods supporting lean manufacturing and other applications of lean thinking such as healthcare, construction, insurance, banking, education, government, and other industries.

There are two main thrusts for Lean Accounting. The first is the application of lean methods to the company's accounting, control, and measurement processes. This is not different from applying lean methods to any other processes. The objective is to eliminate waste, free up capacity, speed up the process, eliminate errors & defects, and make the process clear and understandable. The second (and more important) thrust of Lean Accounting is to fundamentally change the accounting, control, and measurement processes so they motivate lean change & improvement, provide information that is suitable for control and decision-making, provide an understanding of customer value, correctly assess the financial impact of lean improvement, and are themselves simple, visual, and low-waste. Lean Accounting does not require the traditional management accounting methods like standard costing, activity-based costing, variance reporting, cost-plus pricing, complex transactional control systems, and untimely & confusing financial reports. These are replaced by:

- lean-focused performance measurements
- simple summary direct costing of the value streams
- decision-making and reporting using a *box score*
- financial reports that are timely and presented in "plain English" that everyone can understand
- radical simplification and elimination of transactional control systems by eliminating the need for them
- driving lean changes from a deep understanding of the value created for the customers
- eliminating traditional budgeting through monthly sales, operations, and financial planning processes (SOFP)
- value-based pricing
- correct understanding of the financial impact of lean change

As an organization becomes more mature with lean thinking and methods, they recognize that the combined methods of lean accounting in fact creates a lean management system (LMS) designed to provide the planning, the operational and financial reporting, and the motivation for change required to prosper the company's on-going lean transformation.

Marginal costing

See also: Cost-Volume-Profit Analysis and Marginal cost

The cost-volume-profit analysis is the systematic examination of the relationship between selling prices, sales, production volumes, costs, expenses and profits. This analysis provides very useful information for decision-making in the management of a company. For example, the analysis can be used in establishing sales prices, in the product mix selection to sell, in the decision to choose marketing strategies, and in the analysis of the impact on profits by changes in costs. In the current environment of business, a business administration must act and take decisions in a fast and accurate manner. As a result, the importance of cost-volume-profit is still increasing as time passes.

CONTRIBUTION MARGIN

A relationship between the cost, volume and profit is the contribution margin. The contribution margin is the revenue excess from sales over variable costs. The concept of contribution margin is particularly useful in the planning of business because it gives an insight into the potential profits that a business can generate. The following chart shows the income statement of a company X, which has been prepared to show its contribution margin:

Sales	$1,000,000
(-) Variable Costs	$600,000
Contribution Margin	$400,000
(-) Fixed Costs	$300,000
Income from Operations	$100,000

CONTRIBUTION MARGIN RATIO

The contribution margin can also be expressed as a percentage. The contribution margin ratio, which is sometimes called the profit-volume ratio, indicates the percentage of each sales dollar available to cover fixed costs and to provide operating revenue. For the company Fusion, Inc. the contribution margin ratio is 40%, which is computed as follows:

$$\text{Contribution Margin Ratio} = (\text{Sales - Variable Costs})/\text{Sales}$$

The contribution margin ratio measures the effect on operating income of an increase or a decrease in sales volume. For example, assume that the management of Fusion, Inc. is studying the effect of adding $80,000 in sales orders. Multiplying the contribution margin ratio (40%) by the change in sales volume ($80,000) indicates that operating income will increase $32,000 if additional orders are obtained. To validate this analysis the table below shows the income statement of the company including additional orders:

Sales	$1,080,000
(-) Variable Costs	$648,000 (1,080,000 x 60%)
Contribution Margin	$432,000 (1,080,000 x 40%)
(-) Fixed Costs	$300,000
Income from Operations	$132,000

Variable costs as a percentage of sales are equal to 100% minus the contribution margin ratio. Thus, in the above income statement, the variable costs are 60% (100% - 40%) of sales, or $648,000 ($1,080,000 X 60%). The total contribution margin $432,000, can also be computed directly by multiplying the sales by the contribution margin ratio ($1,080,000 X 40%).

References

[1] Performance management, Paper f5. Kapalan publishing UK. Pg 3

[2] Performance management, Paper f5. Kapalan publishing UK. Pg 17

[3] Performance management, Paper f5. Kaplan publishing UK. Pg 6

[4] Mocciaro Li Destri A., Picone P. M. & Minà A. (2012), Bringing Strategy Back into Financial Systems of Performance Measurement: Integrating EVA and PBC, Business System Review, Vol 1., Issue 1. pp.85-102.

Books and journals

• Maher, Lanen and Rahan, Fundamentals of Cost Accounting, 1st Edition (McGraw-Hill 2005).

• Horngren, Datar and Foster, Cost Accounting - A Managerial Emphasis, 11th edition (Prentice Hall 2003).

• Consortium for Advanced Manufacturing-International

- Kaplan, Robert S. and Bruns, W. Accounting and Management: A Field Study Perspective (Harvard Business School Press, 1987) ISBN 0-87584-186-4
- Sapp, Richard, David Crawford and Steven Rebishcke "Article title?" Journal of Bank Cost and Management Accounting (Volume 3, Number 2), 1990.
- Author(s)? "Article title?" Journal of Bank Cost and Management Accounting (Volume 4, Number 1), 1991.

External links

- Accounting Systems, introduction to Cost Accounting, ethics and relationship to GAAP. (http://www.loscostos.info/financial-accounting/accounting-systems.html)
- National Conference on College Cost Accounting (http://www.costaccounting.org)

Article Sources and Contributors

Break-even (economics) *Source*: http://en.wikipedia.org/w/index.php?oldid=620606320 *Contributors*: ABF, Aidas1991, Andy, Andy Dingley, Andycjp, Arancaytar, Art Carlson, Atlant, Atlantia, Bcnviajero, Benauld345, BiH, Blue Tie, Bluemoose, Bobman999, Chamal N, Chendy, Chowbok, Cluelessman, Craw-daddy, Culmensis, David Latapie, DeadEyeArrow, Dmadruga, DouglasCalvert, DragonflySixtyseven, Drpickem, Drprieve, Dysprosia, Edward, Ego White Tray, Electriccatfish2, Fischej, Ginger Warrior, Glane23, Hang Li Po, Happysailor, Headbomb, Hennessey, Patrick, Hu12, Hypopotamus, Iceberg3k, Idont Havaname, Iridescent, JIP, Jac16888, Jan Spousta, John Quiggin, KGasso, Karenmharvey, Karthikndr, Kuru, Lantonov, Lhademmor, Madhero88, Malcolm Farmer, Marcika, Miaow Miaow, Mikael Häggström, Missing Ace, Mk aldatym, Mohammedshamshad, Mummar, Nagy, NathanHurst, Nay Min Thu, Nbarth, Nickbettes, Nmerkner, PanicSleep, Patrick, Pgreenfinch, PhilKnight, Piano non troppo, RashersTierney, Sam Sailor, Saquib Chowdhury, Shai vyakarnam, Singularity42, SpaceFlight89, The month ends, Tide rolls, Toastcard, Trialbikemanwill, Ttwaring, Versageek, WissensDürster, Woohookitty, Yohan euan o4, Максим Єнальєв, 182 anonymous edits

Contribution margin *Source*: http://en.wikipedia.org/w/index.php?oldid=620254420 *Contributors*: Alfonso13, AnesthesiaBusiness, Arthena, Charles Matthews, Chowbok, Cpaulw, Culmensis, DeadEyeArrow, Diegovb, Galactor213, Gprince007, Green Giant, Grunty Thraveswain, Igodard, Ismaelmansieh, Jagielka, Jccann, JohnCD, K6ka, Karenmharvey, Kuru, LeeHunter, MarceloB, Mufka, Nbarth, Niceguyedc, Octopus-Hands, Omerzu, Ormanagement, Patrick, Pjetter, RJFJR, RomanSpa, Sganslandt, Signalhead, Sun Creator, Teammm, Tpb, Waffleriot, Zhenchaojia, 67 anonymous edits

Variable cost *Source*: http://en.wikipedia.org/w/index.php?oldid=618374809 *Contributors*: Aiko, Aldo samulo, Alfonso13, Amin Hashem, Antandrus, Arkuse, Babasss, Bigwyrm, Cmcnicoll, Courthead, Crespodm, David Shay, Decster, Deelkar, Discooo, Dolphin51, Duoduoduo, Elockid, Falcon8765, Fenice, Fraggle81, GateKeeper, Gregalton, Gwoger, HamburgerRadio, Itemirus, Ixfd64, Jimar, John Quiggin, Karenmharvey, Kbkshetty, Kingturtle, Kungming2, Kuru, Laboriousme, Lance6968, LeyteWolfer, Light current, Longhair, MZMcBride, Marija Toshevska, Moonriddengirl, NalinRam, Nbarth, Nsaa, Ohnoitsjamie, Oudmatie, Palica, PepsiMax181, Poisonotter, Renata3, Rettetast, Sardanaphalus, SiobhanHansa, SirIsaacBrock, TheParanoidOne, TheTito, TheoClarke, UBeR, Uttam64, Vanished user 39948282, Versageek, Voyevoda, Waikit, What123, Whpq, Woojoshua78, Yohan euan o4, 129 anonymous edits

Cost of goods sold *Source*: http://en.wikipedia.org/w/index.php?oldid=618288227 *Contributors*: 72Dino, Aegis Maelstrom, Agent007bm, Ahmete60, Ahoerstemeier, Aldo samulo, Alex Rio Brazil, AndrewPresti, Andystwong, Angela, BayArea415, Bluemoose, Bobianite, Bombastus, Carl Steinbeißer, Cdc, Cecropia, Cnwilliams, Comp25, Conce, Desiree hinton-walls, Dewilson526, Edward, Eeekster, Ehn, Far Beyond, Flewis, Goodralph, Gpdunlay, Grandia01, Green Squares, Group2luchs, Hakseng, Iridescent, Jd147703, Joee92, Jwpurple, Kcordina, Krupo, Kuru, Lamro, Laoris, Magioladitis, Manscher, Markerdryer, Mrdthree, Mrt3366, Muchness, Nehrams2020, NeilN, NickW557, NilssonDenver, Oldtaxguy, Petershank, Renata3, Rfc1394, Rjwilmsi, Sbroadwe, Shadowolf, Shyam, SirIsaacBrock, Smettbo50000, Smyth, SummerPhD, Sun Creator, Svetovid, TheParanoidOne, TheoClarke, Traxs7, Ucanlookitup, Uhhlive, Vancouverguy, Vanished user 1234567890, Vigyani, Ws4ever, 114 anonymous edits

Economics *Source*: http://en.wikipedia.org/w/index.php?oldid=621818521 *Contributors*: 100110100, 119, 13alexander, 172, 2004-12-29T22:45Z, 203.31.48.xxx, 209.240.222.xxx, 210.11.23.xxx, 213.3.250.xxx, 4.54.210.xxx, 84user, A Sunshade Lust, A.J.A., A12n, AOL account, APH, ASmartKid, Aapo Laitinen, Aavrakotos, Abraham, AbsolutDan, Achaemenes, Acps110, Acs4b, Adrian J. Hunter, Afaprof01, Afelton, Aformalevent, Ahoerstemeier, Aillema, Ajayupai95, Akamad, Aklop, Aksi great, Alan Liefting, Ale jrb, Alex S, Alinor, Alll, Alxndr, Amianthus, Ancheta Wis, Andersmusician, Andrei Rublev, Andres, AndrewBuck, Andy M. Wang, Angela, Ann Kyslowski, Ann Stouter, Anne, Anorion, Anshuman.jrt, Anskas, Antandrus, Antonwg, Arjun01, Arnemann, Art LaPella, Arteitle, Arthurus21, Artoasis, Arvindn, Asarko, Asbestos, Aschmidt, Asparagus, Atlastawake, AzaToth, Azcolvin429, Aznsclboi, BMF81, Badly Bradley, Bambuway, Bangalos, Barney Gumble, Baronnet, Bart133, Basharh, Bazonka, Bbarkley2, Bbartlog, Bcartolo, Beamathan, Bearly541, Bejnar, Beland, Bellstarr, Bender235, Bentong Isles, Bevo, Big666, Bility, BillGosset, Bkwillwm, Blablablob, Blazik, Bless sins, Blueiris, Bluemask, Bluemoose, Bmicomp, Bobblewik, Bobo192, Bobrayner, Bogey97, Bookinvestor, Borislav, Boud, Bowin, Boxplot, Branddobbe, BrendelSignature, Brian Pearson, Brian0918, Brianjd, Brighterorange, Brion VIBBER, Brisvegas, BrokenSegue, Bronx Discount Liquor, BrownHairedGirl, Bsskchaitanya, Buddha24, BuffyFan4Life, Bunny-chan, Byelf2007, C mon, CIreland, CSTAR, Caiusebo, CalebNoble, Calltech, Calton, Camarinha, Camyoung54, Can't sleep, clown will eat me, Capnned, Cassiopella, Ccc-media, CecilWard, CensoredScribe, Chaos, Childhoodsend, ChildofMidnight, Chinju, Chmouel, Chocolateboy, Chris814, ChrisGualtieri, Christian List, Christopher Parham, Ciaccona, CircleAdrian, Claireclear, Cleanupman, Clicketyclack, Clopedia, Closeapple, Cobrajs15, Codex Sinaiticus, Colignatus, Colonies Chris, ComfyKem, CommonsDelinker, Conversion script, Coricus, Corpx, Craig Mayhew, Crazytales, Cretog8, Crystallina, Crzycheetah, CsDix, Cst17, Csusarah, Cupco, Cwcarlson, Cyde, Czalex, DASonnenfeld, DTMGO, DWP17, Dalwalkat, Danheac, Daniel Brockman, Daniel5127, Danielfarber, DanyX, Darx9url, Dasha14, Dassiebtekreuz, Daven200520, Davewild, David, David B Stephens, David Gerard, David.jaymac, DavidLevinson, Dawlco, Dcflyer, Dcoetzee, Dduff442, DeadEyeArrow, Dekimasu, DerHexer, Deus Ex, DevastatorIIC, Dewritech, Deák, Dhammapal, Diannaa, Dick Bos, Dlewis7444, DocWatson42, DocendoDiscimus, DoctorW, Doctus, Dodiad, Dogo, Dontrustme, Dori, Dpen2000, Dpr, DrThompson, Dreispt, Dullfig, Dunff85, Duoduoduo, Dupz, Dwilso, Dwrcan, Dylan Lake, ECEstats, EGeek, EPM, ER MD, ERcheck, EamonnPKeane, EatAlbertaBeef, Eb00kie, Economistlai, Econos, Editfromwithout, Edreamleo, Edwinstearns, Ejspeiro, Eklipse, El C, El T, Ela112, Elapsed, Eloquence, Emancipated, Emesee, EnOreg, Enchanter, Epiq, Erp204, Escape Orbit, Essexmutant, EurekaLott, EuroTom, Euryalus, Evercat, Everyking, Evolauxia, Evolife, Exeunt, Explicit, FF2010, Fabhcún, Fabricationary, Faizanalivarya, Falcon007, Fastfission, FayssalF, Fazyninja, Fconaway, Fedayee, Feedmymind, Felizdenovo, Femto, Fennec, Fetchcomms, Fiddler7, FiftyNine, Fildon, Fintor, Fireice, Firulaith, Fish and karate, Fishiehelper2, Fizyxnrd, Flockmeal, Florian Blaschke, Flower5677, Fortdj33, Frank A, FrankCostanza, FrankTobia, Freakofnurture, Fredrik, Frencheigh, FreplySpang, Fruchogurt, FuelWagon, Funkelngelneu, G. Campbell, GGano, Gabbe, Gaius Cornelius, Galizia, Galoubet, Galwhaa, Gamewizard71, Gareth Owen, Gary, GaryB84, Gblaz, Geeoharee, Gemini1980, Giftlite, Gilliam, Giraffedata, GoingBatty, Golbez, Graculus, Graham87, Graith, GregAsche, Gregorya, Gretchen, Gribeco, Grick, Ground Zero, Grunt, Guerby, Guest2625, Gwen Gale, Gwernol, Hadal, Halthecomputer, Hamsterlopithecus, Hard Raspy Sci, Headbomb, Hefaistos, HenryLi, Hezarfenn, Hide&Reason, Hihihi2324, Hmains, Hmorgan422, Hu, Hu12, Hubbardaie, Hubriscantilever, Husond, Iain99, Icekiss, Icut4you, IjonTichyIjonTichy, Ikilled007, Ilikerps, Ilya, ImperfectlyInformed, Islescape, Isomorphic, Itamarkalimi, Ithacagorges, Itsmejudith, Ixfd64, J. Milch, J8079s, JAn Dudík, JDnCoke, JFreeman, JHP, JKWithers, JRR Trollkien, JRWalko, JS, Jabraham, Jac16888, Jacj, Jacko152, Jagged 85, Jaimedv, Jakohn, Jamcib, JamesReyes, Janosabel, January85, Jasperdoomen, Jayparkhe, Jaysscholar, Jdevine, Jdforrester, Jeanphi, Jeff G., Jeffmcneill, Jehana, Jennifer, Jersey Devil, JesseHogan, Jguk, Jiang, JinJian, Jirka.h23, Jkv, Jmabel, Jni, Jo3sampl, Jobermiester, Joel Kincaid, Joel Parker Henderson, JoergenB, John Quiggin, JohnGaltJr, Johnjay1745, Johnkoirala, Jojit fb, JonHarder, Jondel, Jorend, Jose77, Joseane, Joseph Solis in Australia, Josephcunningham, JoshuacUK, Joy, Joycloete, Joyous!, Jpbowen, Jphillips66, Jrincayc, Jrtayloriv, JuanFox, Jugni, Jusjih, Jörg Sutter, KaatieP, Kajasudhakarababu, Kakofonous, Kangphil, Karimarie, Karlwick, Kashi0341, Ke4roh, Kenneth M Burke, Keremcantekin, Kernigh, Kevin B12, Kf4bdy, Kharoon, Kiefer.Wolfowitz, Kingturtle, KinkyLipids, Kintetsubuffalo, Kipala, Kivar2, Kjkolb, Kkailas, Kks ceser, Klapton, Knverma, Kokoriko, Koringles, Kortaggio, Koyaanis Qatsi, Kukini, Kungfuadam, Kusma, Kuyi123w, Kwamikagami, LK, Ladril, Lalitasuman, Lambiam, Lancemurdoch, Larklight, Latka, Laurinavicius, Lawandeconomics1, Lawrencekhoo, Lbertolotti, Ldonna, Lee J Haywood, Leonard G., Leszek Jańczuk, Leuko, Licor, Lieutenant of Melkor, Liftarn, Lightmouse, Lights, LilHelpa, Liongold, Lisiate, Lithos12, Livajo, Ljean, Lkinkade, Locos epraix, Logan, Logwea299, Lolm8, Lord Farquaad, Lordofolympia 14, Lorpius Prime, Lotje, Lowellian, Lsy098, Luna Santin, Lupin, M A Mason, MCrawford, MGTom, MZMcBride, MaCRoEco, MacTire02, Macrocompassion, Madandnaked, Madchester, Madhava 1947, Madliner, Madmaxx, Magioladitis, Maharashtraexpress, Mahusha, Makemi, Malhonen, Man vyi, Mani1, Mar4d, Marcika, Mark Schierbecker, MarkNeville, MarsRover, Marshallsumter, Marskell, MartinDK, MartinPoulter, Marysunshine, Master Jay, Masterpiece2000, Mateo SA, Matt Heard, Mauler90, Maureen, Mav, Max Naylor, Mayumashu, Mboverload, Mccready, Mdd, Mdnahas, Meelar, Meno25, Mernst, Merovingian, Meursault2004, Mgmwki, Mgw, Mic, Michael Hardy, Michaelstor, MickPurcell, Miguel, Miguel in Portugal, Miguelzinho, Mihai, Mike Rosoft, MikeEd, Mike Madeline, Mikrocicecream, Mirwin, Miss Madeline, Missionary, MisterCharlie, Mithridates, Mitsuhirato, Mjec, Mod0001, Modern Economics, Mohammadgani, Moopiefoof, Morphh, Morrad, Mouramoor, Mpeisenbr, Mr Stephen, Mrdthree, Mrighy, Mrm7171, Mrushbenton, Msrasnw, Mtlhedd, Muijzo, Muxxa, Mwanderson, Mxn, Mydogategodshat, N2e, NHRHS2010, Naaman Brown, Nakos2208, Nannen, Naohiro19, Narssarssuaq, Nat Krause, NawlinWiki, Nay Min Thu, Nayvik, Nbarth, Nctrlaltdel, Neelix, Nema Fakei, Neo Poz, Neo-Jay, Netesq, Netoholic, Neutrality, NewBlueSoap, NewEnglandYankee, Newone, Ngchuhim, Niemeyerstein en, Niffweed17, Nigholith, Nikai, Nikodemos, Ninnnu, Nirvana888, Nk, Nmcmurdo, Norm, Northern bear, Notinasnaid, NuclearWarfare, Numanumega, Nuttycoconut, Nwanda, Obamafan70, Ocee, Ocolon, Oe1kenobi, Ohnoitsjamie, Ohthelameness, Oijl, Oiqbal, Oleg Alexandrov, Olikawala, Olivier, Olwak, Omkar Tivrekar, Omnipaedista, Orborde, Oreo Priest, Osairuit, Oscarjquintana, Ossguy, Otets, OverInsured, Owl, Oxford Dictionary, Oxymoron83, PJM, Pa68, Page Up, Pak21, Paki.tv, Pamri, Parable1991, Pasixxxx, Passw0rd, PatrickFlaherty, Patstuart, Paul August, Paul Drye, PaulGarner, Paum89, Pax:Vobiscum, Pcarbonn, Pde, Peregrine981, Peter Horn, Peter mcmahan, PeterSymonds, Pgk, Pgreenfinch, Phil69, PhilipMW, Phillip J, Pierpietro, Pilim, Pinkpedaller, Piolinfax, Pion, Pippo2001, Pit, Pladask, Plek, Poccil, Pochsad, Pointrustme, Polipolit, Polylepsis, Polytopic, Poor Yorick, Porterfan1, Possum, PraxisConsensus, Prestonmcafee, Prof. Squirrel, Professore, Protokurios, Pularoid, Quadell, QueenCake, R'n'B, REDyellowGreenBLUE, RJII, RW Marloe, RandomP, Randomran, Rasmus Faber, RaveX, Ravensfire, Razimantv, Rbrwr, Reach Out to the Truth, RedHouse18, Reedy, Reinis, Remember, Remi0o, Rentaferret, RetiredUser2, Revisor2011, RexNL, Rhobite, Rich Farmbrough, Richard Taylor, Richard001, RichardF, Richardboswell, Richhoncho, Rick Norwood, Rinconsoleao, Ringan, Rjwilmsi, Rl, Rlest, Robbie098, Robert Turner, RobertG, Robinbanerjee, RockMFR, Rose Garden, Rossami, RoyBoy, RoyalTS, RuggedRock, Ruud Koot, Ruy Lopez, Rwells85, RxS, Ryan Paddy, Ryan.Singer, S7even, SEIBasaurus, Sachindole, Sadi Carnot, Sahilkk, Sairahulreddy, Salsa Shark, Sam Francis, Sam Hocevar, Samohyl Jan, Sapaloe, Saurc zlunag, Sawdust Restaurant, SchmuckyTheCat, Scifiintel, Sciurinæ, Scott Burley, Scott Illini, Scott Ritchie, Sdrawkcab, Secretlondon, Sengkang, Sephiroth m75, Sevenoaks, Sexysaz, Shabidoo, Shadowjams, Shanes, ShaunES, ShaunMacPherson, Sibybhai, Siddhant, SilverStar, Silversoul7, Simem007, SimonP, Sir Nicholas de Mimsy-Porpington, Skeppy, Skieffer, Skipsievert, Sky Harbor, SlamDiego, Slrubenstein, Smallbones, Smallman12q, Smartal, Smeira, Smmurphy, Smsagro, Snacks, Snowmanradio, Snoyes, Solarkennedy, Solid State Survivor, Someguy1221, Sonicsuns, Soosed, Soporaeternus, South Bay, SpNeo, Spartaz, SpookyMulder, Sqeekywheeler, Sreekanthnair123, Srich32977, StaticGull, Steel, SteinbDJ, Stephanwehner, Stereo, Steve Casburn, Stevertigo, StewartMine, Stirling Newberry, Storm Rider, Streetstrategist, Stumpf1, Stupid girl, Sundar, Sunshine1978, Susurrus, Syiem, T-borg, TEB728, TNTfan101, Taak, Tabletop, TakuyaMurata, Tang23, Tangotango, Tariqabjotu, TastyPoutine, Taxman, Tb0412, Tbhotch, Tc91102, Tedernst, Teenwriter, Terence, Terjepetersen, Terra Novus, Tesfatsion, TexasAndroid, Tftb, Tgeller, Thadius856, The Cunctator, The Epopt, The Fat Guy, The Land, The Nerd from Earth, The Power of Reason, The Random Editor, The Transhumanist, The Transhumanist (AWB), The Wikimon, TheChieftain, TheProject, Theadder, Thechemist21, Thewayforward, Thincat, Thomasmeeks, Thrissel, Tillda, Tilmanb, Tim Shell, Timir2, Timneu22, Tintazul, Tito-, Titoxd, Tj-tilli-wiki, Tmh, Tobacman, Tobby72, Tomisti, Romtega, Tony1, Tool, Tpbradbury, TreasuryTag, Treisijs, Tugaworld, Tyc20, Typelighter, TypoDotOrg, Tyrol5, Tzartzam, UH Collegian, Ufim, Ujalm, Ulmke, Ungvichian, UnicornTapestry, Universalcosmos, Urhixidur, User2004, Van helsing, Vanished user 5zariu3jisj0j4irj, Vanished user 9i39j3, Varlaam, Vector Potential, Vegas949, Veinor, Velblod, Velibos, VeryVerily, Vicki Rosenzweig, Victorlamp, Villafanuk, Vinay Varma, Vinícius94, Violetriga, Vipinpanwar, Virginiawhite09, Vision Thing, Viskonsas, Vkvora2001, Volunteer Marek, Vuong Ngan Ha, WAS 4.250, WGee, WPGA2345, WT guy, Walrasiad, Walton One,

Warfvinge, Washiwasha, Wavelength, Waveofthefuture, WeakTrain, Weriov, Wetman, Wgeoghegan, Widefox, Wikiant, Wikid, Wikidea, Wikijectivist, Will Beback, William conway bcc, Windfinder, Wingroras, WojPob, Woohookitty, Wossi, Wwheaton, Wwoods, Wwwsamcom, XJaM, Xavier Combelle, Xe7al, Xenophon101, Xiong Chiamiov, YK Times, Yahel Guhan, YahoKa, Yamamoto Ichiro, Yarafarida, Yhkhoo, Yjones, Youssefsan, Z. Patterson, Zapvet, Zero76, Zfr, Zulu, King Of The Dwarf People, Δ, ماني, 1226 anonymous edits

Cost accounting *Source*: http://en.wikipedia.org/w/index.php?oldid=621221934 *Contributors*: 72Dino, A Train, AWeenieMan, Addshore, Alansohn, Alfonso13, Altenmann, Andrewman327, Andycjp, Anomalocaris, Antandrus, Antonwg, Athrion, AvicAWB, Avoided, BMaskell, Bambykay, Benboy00, Bgwhite, Bluemoose, Boris Barowski, Brianga, Bryan Desjardins, Buyera Saidi Comrade, C.Fred, Caltas, Camano2121, Capricorn42, Cherkash, ChrisGualtieri, Cjosefy, Correogsk, Cwolfsheep, DKO 2012, DaL33T, David Cooke, Donner60, Dougofborg, Dpr, Edward, Eeekster, Elfguy, EoGuy, Faiz1933, Faizan, Far Beyond, Fenice, Fluck, GageSkidmore, GeorgeMoney, Geraldmurphy, Graham87, Hephaestos, Hulagutten, Inlandmamba, Iridescent, Ironwolf, It Is Me Here, Ivanvector, J r holder, JPV, Jksauder, Jni, John Quiggin, JosiahMarcus, Joy2discover, Jprg1966, Juanparve, Kablammo, Kalanithe, Kuru, Kwertii, Leanadvisors, Leonard John P, Liface, LilHelpa, Lkesteloot, Lmatt, Loaferman, Longhair, MER-C, Magioladitis, Markerdryer, MartinMichlmayr, Materialscientist, Maxis ftw, Mbshukla, Mdrasel92, Metcalm, Mic, Michael Hardy, Mike hayes, Mintleaf, MrOllie, Mydogategodshat, Nakon, Nbarth, Nehrams2020, NilssonDenver, Nino Gonzales, Nirjal stha, Nlsanand, Octopus-Hands, Olivier, PascalPerry, Petrb, Phmoreno, Pm master, Pmeisel, Poli08, Pratyya Ghosh, QtheAllmighty, Quarl, Queenie Wandy, R'n'B, Rainald62, Rasultnt, RayBirks, Rca institute, Redvers, Rembecki, RexNL, Rfc1394, Rhobite, Sepersann, Shimup, Signor Eclectic, SiobhanHansa, Sistchennai, Sopoforic, Spoond, SueHay, Taestell, Template namespace initialisation script, TheRingess, TheoClarke, Tkay, U2fanboi, Utcursch, Vraghava, Waggers, What123, Widr, Wikiuser82, Windharp, Wissons, Wmahan, Woohookitty, Writers Bond, Yabbadab, YouAndMeBabyAintNothingButCamels, 430 anonymous edits

Image Sources, Licenses and Contributors

License