A

AAA rating *See* TRIPLE-A RATING.

abatement cost The cost of securing a reduction in pollution. The abatement cost can be quoted as a cost per unit or the total cost of achieving a given target. The marginal abatement cost should be equated to the marginal benefit to determine the efficient reduction in pollution. The concept of abatement cost applies to pollution caused by the production activities of firms and the consumption activities of consumers. *See also* EXTERNALITY.

ability and earnings *See* EARNINGS FUNCTION.

ability to pay The principle that any *tax should fall on those who can afford to pay. The government requires tax revenue to pay for *public goods and *income redistribution. Taking account of ability to pay means that tax payment should increase with the income or assets of taxpayers. The main objections to the ability to pay criterion are that it is hard to measure ability to pay, and that taxing income reduces the incentive to work. However, the collection of taxes from those who cannot afford to pay is unpopular, expensive, and sometimes impossible. Ability to pay is an alternative to the *benefit principle under which only those who benefit from any given public expenditure should be taxed to pay for it. Given the scale of taxes necessary to run a modern society, use of the ability to pay criterion for taxation seems inevitable.

abnormal profit *See* SUPERNORMAL PROFIT.

absolute advantage The ability to produce an output using fewer inputs than other producers. With only one type of resource, such as hours of work, a producer with lower inputs has an absolute advantage. When there are many factors of production absolute advantage means that the *production set for one producer is everywhere outside that of another. Absolute advantage gives no guidance on what to do with resources, which are best employed where their *comparative advantage is greatest.

absorption The total of expenditure on real goods and services, by consumers, investors, and the government. Absorption is the use of output: it excludes exports and includes imports. This is contrasted with *production, which includes exports and excludes imports. The absorption approach to *devaluation looks at its effects on various forms of expenditure, and points out that devaluation can only improve the balance of payments on current account if production increases relative to absorption.

abstinence Refraining from, or at least postponing, consumption which could have been undertaken immediately. Where the funds not being spent arise from current income, abstinence is thus the same as *saving; but the term also covers refraining from running down past savings or spending windfall gains.

accelerated depreciation The right to *write off capital goods for tax purposes faster than the rate at which they would normally be depreciated. This is intended to encourage *investment, as it enables a company to defer its taxes when it invests. Under accelerated depreciation a firm's profits net of *depreciation, and thus its tax liabilities, are lower than they would have been under normal depreciation. Once the capital goods are written off, profits net of depreciation become higher than they would have been under normal depreciation, and the tax bill rises again.

accelerator A model relating *investment to changes in *output. The accelerator model asserts that firms invest more when output is rising and less when it is falling. The argument is that a rise in *demand leads some firms to produce more and leads them, and other firms, to expect that demand will rise further. The rise in output raises the ratio of output to *capacity, and the expectation of further rises in demand makes firms believe it would be profitable to have more capital equipment. Accelerator-type models help explain empirically observed variations in both *fixed investment and *investment in stocks and work in progress.

acceptance Adding one's signature to a *bill of exchange, thereby accepting *liability to pay the bill at *maturity if the original signatory fails to do so. Acceptance of a bill of exchange by an institution of high financial standing, such as a *merchant bank, makes the bill safer to hold and thus easier to sell. The acceptor is taking a *risk, and makes a charge for this.

accepting house A financial firm that is willing to accept *bills of exchange, that is, to guarantee that they will be paid on the due date. An accepting house uses its financial reputation to earn a fee for acceptance, and its specialized knowledge of financial markets to avoid taking too many risks of accepting bills where it is actually going to have to honour its *guarantee. The principal London accepting houses form the Accepting Houses Committee.

accession countries Countries applying to join the *European Union (EU). The countries that are currently linked with future membership are Croatia, Bosnia, the Republic of Macedonia, Turkey, Montenegro, Serbia, and Albania. Accession country is also used to refer to a country that has recently joined the EU, including Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia.

accommodatory monetary policy A policy of allowing the supply of money to expand in line with the demand for it. If the *demand for money rises because of sustainable real growth in the economy, accommodatory monetary policy is desirable, and failure to expand the *money supply obstructs real growth. If, however, the cause of rising demand for money is a temporary, unsustainable surge in real activity, *inflation in prices and wages, or both, accommodatory monetary policy allows these excesses to continue too long. When obvious *excess demand or high inflation eventually forces a shift to a more restrictive monetary policy, this will have to be severe and may cause a serious *depression.

account(s) A statement about activities over some period. Accountability is the obligation to produce such a statement: the directors of companies are accountable to their shareholders, and in the UK ministers are accountable to Parliament for the activities of their departments. Accounts take various forms:

1. A statement of the relations between two parties: a *bank account records the deposits, borrowing, and withdrawals of a customer. Firms keep accounts of the goods and services provided to customers: goods provided on account are supplied on credit, and an account rendered is a demand for payment for goods and services supplied.

2. A systematic summary in money terms of the activities of a business over some period, usually a year. The two main statements in such accounts are the *profit-and-loss account and the *balance-sheet. A profit-and-loss account shows receipts and payments, and the profit or loss made during an accounting period. A balance-sheet lists the *assets and *liabilities of a firm on specified dates, at the start and the end of an accounting period. Accountants are producers and *auditors of accounts: they are often required to be professionally qualified, where the accounts have to be credible to creditors, law courts, and the tax authorities. Firms' accounts have to be certified as accurate by professional auditors.

3. National income and expenditure accounts are surveys of the economic activities of a nation. They include analysis of the production of goods and services, the distribution of incomes, and the expenditures of investors, consumers, and the government. In the parts of national income accounts related to transactions with the rest of the world, the *current account records sales and purchases of goods and services, property incomes and transfers, and the *capital account records sales and purchases of assets, including both real *foreign direct investment, inwards and outwards, and financial transactions, sales and purchases of securities abroad, and the making and repayment of international loans. *See also* APPROPRIATION ACCOUNT; BANK ACCOUNT; CAPITAL ACCOUNT; CHECKING ACCOUNT; CURRENT ACCOUNT; CURRENT (BANK) ACCOUNT; DEPOSIT ACCOUNT; MERCHANDISE ACCOUNT; PROFIT-AND-LOSS ACCOUNT; UNIT OF ACCOUNT.

accounting *See* COST ACCOUNTING; CREATIVE ACCOUNTING; INFLATION ACCOUNTING; MANAGEMENT ACCOUNTING.

accounting period The period of time, normally a year, to which a set of company accounts refers.

accounting profit The level of profit calculated using standard accounting principles. Accounting profit is equal to sales revenue less the explicit costs of a firm's operation, such as input costs, depreciation, interest, and taxes. In contrast, the calculation of *economic profit also includes the normal return to capital as a cost.

accounts payable The part of a firm's *liabilities, as shown in its *balance-sheet, consisting of bills received from suppliers on which payment is due but has not yet actually been made.

accounts receivable The part of a firm's *assets, as shown in its *balance-sheet, consisting of bills sent to customers on which payment is due but has not yet actually been received.

acquisition (company) Expansion of a *company through the purchase of other businesses. If these are unincorporated, terms are agreed with the owners. If the other business is a public company, its *shares are bought. Where some, but not all, of the shares of another company are bought, special rules govern the treatment of existing shareholders who do not wish to sell their holdings. *See also* REVERSE TAKEOVER.

actuarially fair odds *See* FAIR ODDS.

actuary An expert who uses statistical records to predict the future. An actuary uses records of the occurrence of uncertain events, such as death at given ages, or fire, theft, and accidents to cars, to predict how frequently similar events are likely to occur in the future. These predictions take account of observed trends in health or crime, as well as past facts. Actuarial expertise enables *insurance companies to write policies with an expectation of making profits, but not with complete reliability.

adaptive expectations The principle that the future values of an economic variable can be calculated using its past values and a margin of error. Under adaptive expectations people learn from their experience, in a predictable way. For example, if the current inflation rate is higher than had been expected people revise their expectations for the future inflation rate upwards.

adjustable peg A system where countries stabilize their *exchange rates around *par values that they retain the right to change. Under this system a country undertakes to intervene in the foreign exchange market to keep its currency within some margin, for example 1 percent, of some given exchange rate parity, the 'peg'. The country retains the right to adjust the parity, that is, to move the peg. This was more or less the case under the *Bretton Woods system in the 1950s and 1960s. This system provides opportunities for *speculators at times when it appears that the peg is going to have to move, but has not yet done so.

adjusted *R*-squared A version of the *coefficient of determination (*R*-squared) adjusted for the degrees of freedom. While *R*-squared will never decrease when adding a variable to the regression, adjusted *R*-squared will rise or fall, depending on whether the contribution of the new variable to the fit of the regression more than offsets the correction for the loss of an additional degree of freedom. Adjusted *R*-squared can also be negative.

adjustment *See* CYCLICAL ADJUSTMENT; PARTIAL ADJUSTMENT; SEASONAL ADJUSTMENT.

adjustment costs The costs of making changes in the economic *variables one controls. Any economic agent, whether an individual, a firm, or a government, has *preferences which determine what the optimal levels of the variables under their control would be, if they were free to make a fresh start in setting them. When actual levels differ from these optimal levels, adjustment costs must be considered.

If adjustment costs are lump-sum, or increase proportionally or less than in proportion to the changes made in any one period, it will pay to make at once any change that is worth making at all. If adjustment costs increase more than proportionally to the size of the change, however, it pays to adjust only gradually. In adjusting its labour force, for example, a firm may find that small increases present no recruitment problem, and small decreases can be accommodated by *natural wastage because of retirements and other voluntary departures, whereas rapid recruitment poses serious selection and training problems, and rapid decline involves *redundancies, which are expensive and damaging to morale. *See also* MENU COSTS.

adjustment programme A package of policy measures designed to cure *balance-of-payments problems. Adoption of a satisfactory adjustment programme is frequently made a condition of assistance from the *International Monetary Fund. Curing balance-of-payments problems requires decreasing *absorption relative to production. This can be approached via reducing absorption, by cutting government spending, and/or increasing taxes. It can also be approached via increasing production by using resources more efficiently; this often involves increased use of the market mechanism and *devaluation of overvalued currencies.

administered price A price set by some form of administrative process, rather than adjusting to clear a market. The levels of and changes in administered prices often require the consent of the government or of some official regulatory body. Administered prices may be maxima, as in the case of *rent controls, or minima, as with *minimum wage laws and some agricultural policies.

administration The situation of a *company in financial difficulties whose affairs are put into the hands of an administrator by court order. The object of administration is to enable the company to survive as a going concern or, if that proves impossible, to get a better price for its assets than immediate *liquidation would produce.

ad valorem tax A tax proportional to the price of the object being taxed. This can be contrasted to a *specific tax which is levied at a rate per unit of quantity, independent of the price. Ad valorem taxes have the advantageous feature that their real value is not eroded by *inflation.

advance corporation tax (ACT) The system by which UK companies deducted income tax at source when distributing *dividends to their shareholders. With a tax rate of 100t percent, companies paid the Inland Revenue £$t/(1 - t)$ for every £1 distributed to shareholders. These payments were treated as a payment on account of the company's own *corporation tax. ACT was abolished in 1999.

advances Bank loans to their customers. These may be *unsecured loans, but are often secured by the bank holding stocks and shares or *life insurance policies owned by the borrower.

advantage *See* ABSOLUTE ADVANTAGE; COMPARATIVE ADVANTAGE.

adverse selection The tendency for a *contract to attract the types of agents that are least profitable. For example, if an insurer offers *health insurance without any medical examination, the expectation is that people with poor health prospects are likely to accept it, while people with better health prospects, who can get better terms from a more selective insurer, will reject the unconditional contract. In trying to be non-selective, adverse selection causes the worst risks to select themselves. Adverse selection is a consequence of *asymmetric information: agents know their own type (private information) but this is unobservable (no public information). Contracts that could be offered if agent types were observable cannot be offered when types are unobservable, and this can result in *market failure.

adverse supply shock An unexpected shift of the supply curve to the left, i.e. a reduction in the quantity supplied for any given price. This could result from natural disasters such as floods or earthquakes; from human, animal, or plant diseases; or from major political upheavals such as war or revolution. To oil importers, the sudden price increases imposed by the *Organization of Petroleum Exporting Countries in the 1970s appeared as adverse supply shocks. Such a shock reduces the *real income an economy can produce even at full employment of its available resources. Supply shocks are used as a modelling device in macroeconomics to represent aggregate economic risk.

advertising Activity designed to sell products. It seeks to attract the attention of potential customers, inform them of the existence and attributes of a product, and persuade them to start or continue to buy it. It works via the media, that is, newspapers, television, or the internet; by shop displays, posters, or mailshots; or through the actual design of products themselves and their packaging. While there is a logical distinction between informative and persuasive advertising, psychologically these are extremely difficult to distinguish. Political, charitable, and religious bodies, and the government, advertise, as well as commercial organizations.

Advisory, Conciliation and Arbitration Service (ACAS) A UK *quango providing facilities for conciliation, arbitration, and mediation in *industrial disputes.

after-sales service The provision of services after goods have been sold which make them more useful to customers. This can include advice on and training in the use of the product; routine maintenance, servicing, and repairs in the event of breakdown; provision of materials and spare parts; replacement under *warranty in the event of failure of the goods supplied; and updating if the product is developed further. Customers' expectations of cheap and efficient after-sales service are of great importance in making products competitive, and lack of customer confidence in the quality and price of after-sales services may make products unsaleable. *See also* COMPETITIVENESS.

after-tax income The income remaining to an individual or a company after *direct taxes have been paid. The calculation of after-tax income takes no account of the liability to *indirect taxes when the income is spent.

age–earnings profile A graph showing the mean earnings of workers at various ages. Such profiles can be drawn up for all workers, or for specified groups of workers, for example manual workers, professional workers, etc.

agency cost *See* AGENCY THEORY.

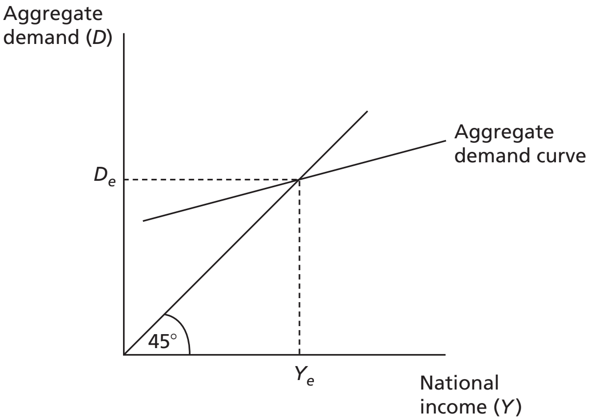
agency problem The difficulties encountered when a principal delegates a task to an agent. The agency problem arises when the principal and the agent have different objectives and there is *asymmetric information and an *incomplete contract. The asymmetric information prevents the principal from perfectly monitoring the agent, and the incomplete contract makes it impossible to determine what will occur in all possible contingencies. The principal cannot therefore ensure that the agent always chooses the action the principal would wish to see chosen. *Agency theory determines how contracts can be designed to ensure that these problems are best mitigated.

agency theory The theory of the contractual relationship between a principal and an agent. Agency theory analyses the issues that arise when a principal delegates a task to an agent but there is *asymmetric information and an *incomplete contract. The basis of the analysis is that the principal and the agent have different objectives. For example, the owner of a firm (the principal) may wish to maximize profit but the manager of the firm (the agent) aims to maximize a utility function that is increasing in income but decreasing in effort. The first-best contract would make the reward a function of effort and be designed to induce the efficient effort level in every circumstance. The agency problem arises when there is an asymmetry of information such that the principal cannot observe the effort level of the manager and hence cannot condition the contract upon it. Instead, the contract has to be conditioned upon an observable and verifiable quantity such as the level of profit. This prevents the contract from ensuring that the efficient level of effort is always supplied. The design of the contract has to take into account incentive effects and the allocation of risk between the principal and the agent. It is often assumed that the principal is *risk-neutral and the agent *risk-averse, in which case, putting incentive effects to one side, all of the variability in pay-off should fall on the principal. Such a contract does not provide any incentive for the agent, so leading to the balance of risk sharing and incentives. The need to provide an incentive to the agent makes the expected profit of the principal lower than that with the first-best contract that could be used with no asymmetry of information. This is the agency cost of implementing a second-best contract in the presence of asymmetric information. Agency theory has found many applications in economics. Two illustrative examples are the consequences of the separation of control between shareholders and managers, and the delegation of taxation and *public good provision to states within a federation.

agglomeration economies The *external economies of scale available to individuals or firms in large concentrations of population and economic activity. These arise because larger markets allow wider choice and a greater range of specialist services. Agglomeration economies are believed to explain the tendency of conurbations to contain an increasing share of the population of many countries.

aggregate demand The total of intended or *ex ante attempts to spend on final goods and services produced in a country. In a *closed economy aggregate demand is the sum of consumption, investment, and government spending on goods and services. In an *open economy in addition to this it includes export demand and excludes imports. A rise in aggregate demand is a necessary condition for an increase in real output. It is not a sufficient condition, however, unless an economy has spare *capacity to produce the goods and services demanded. If the goods demanded are available only as imports, these rise; if the extra goods are not available at all, inflationary pressure is created.

aggregate demand schedule A diagram showing for each level of *national income the total level of aggregate demand in an economy that would result from it. *Internal balance in the economy requires that aggregate demand be equal to national income.



Aggregate Demand Schedule

aggregate production function *See* PRODUCTION FUNCTION.

aggregate supply The total amount of real goods and services that the enterprises in an economy are willing to provide at any given ratio of prices to wages. This can be increased by greater *productivity due to increases in the volume of productive equipment or improvements in technical knowledge or the quality of the labour force. Whether actual output equals aggregate supply depends on two conditions. First, there must be sufficient aggregate demand to match the supply: if there is not, output is demand-constrained. Second, there must be a sufficient supply of labour to satisfy firms' demand for it: if *real wages are low, aggregate supply by firms may require more employment than the labour supply forthcoming at these wages, in which case output is constrained by labour shortages. In an economy where firms do not act competitively, the concept of aggregate supply is not applicable: firms in markets characterized by *imperfect competition do not have supply curves. *See also* DEMAND-DETERMINED OUTPUT.

aggregation The process of summing individual values into a total value. Aggregate demand is the sum of demand from individual economic agents, and the aggregate capital stock is the sum of capital held by individual firms.

aggregation problem **1.** The conceptual difficulties encountered when an aggregate value is used to represent the total of individual values. Consider an economy with many firms, each of which uses inputs of capital and labour to produce output. Two forms of aggregation problem can arise. First, any attempt to sum the quantities of capital used by individual firms to arrive at an aggregate quantity of capital has to confront the issue posed by different types of capital. For instance, the number of metal presses used by a car manufacturer cannot just be added to the number of computers used by a software developer. Second, even if all firms use the same type of capital, it is generally not possible to aggregate the firms into a single representative firm using the aggregate stock of capital. For this to be possible it has to be the case that one extra unit of aggregate capital produces the same additional output as one extra unit of capital for an individual firm. This is only true if all firms have access to the same *constant returns to scale production technology.

2. The erroneous interpretation of observed association between two variables at the aggregate level as evidence of association at the individual level. This is also known as the *ecological fallacy.

agricultural protection The use of *tariffs and trade controls on agricultural products to raise their prices in a country and thus to increase its farmers' incomes. This may be desired to slow down the tendency for the share of agriculture in total income and employment to decrease. It may also aim at increasing self-sufficiency in foodstuffs and agricultural raw materials in the interests of national security. Agriculture is protected in most industrial countries, particularly those of the European Union and Japan. Agricultural protection in advanced countries hinders economic growth in *less developed countries, most of which are net exporters of agricultural products.

aid Economic assistance from one country to another, the recipient typically being a *less developed country. Aid is usually intended either to provide humanitarian relief in emergencies, to promote economic development, or to finance military expenditure. Aid may take the form of outright gifts of money, which may be tied to purchases from the donor, or untied and available for expenditure anywhere. It may take the form of *soft loans, on terms easier than those available to the borrower in the world capital market. Aid may also be given in kind, including food, plant and equipment, military supplies, or technical assistance. Bilateral aid is given directly by a donor to a recipient country; multilateral aid is channelled through an international organization, without direct contact between donors and particular recipients. *See also* GRANT IN AID; TIED AID; UNTIED AID.

Aid to Families with Dependent Children (AFDC) A US federal welfare programme, originally set up in 1935, that enabled states to use federal grants to provide financial support for poor children. AFDC was replaced in 1996 by *Temporary Assistance to Needy Families.

Aitken estimator This is more commonly known as the *generalized least squares estimator.

Allais paradox An example of choice under uncertainty where the outcome for most experimental subjects violates the axioms of *expected utility theory. In the first experiment subjects are requested to choose between winning £1 million for sure and a gamble in which the prizes are £1 million with probability 0.89, £5 million with probability 0.10, and nothing with probability 0.01. Most experimental subjects would choose the option of £1 million for sure. In the second experiment the choice is between two different gambles. For the first gamble the prizes are nothing with probability 0.89 and £1 million with probability 0.11. The second gamble has prizes of nothing with probability 0.90 and £5 million with probability 0.10. Most subjects choose the second gamble. These typical choices violate the independence axiom of expected utility theory: if the first option is chosen in the first experiment then the first option should also be chosen in the second experiment. The Allais paradox and other similar examples have motivated the search for alternatives to expected utility theory. *See also* ANOMALIES; BEHAVIOURAL ECONOMICS; DECISION THEORY; PROSPECT THEORY.

Almon distributed lag A version of a restricted lag model in which the lag coefficients are parameterized as polynomial functions. This model allows the capture of delayed or non-monotonic impact of lagged variables upon the dependent variable and is used mostly for relatively short time series with long lags. The major drawback, common for restrictive functional forms, is the induced autocorrelation.

almost sure convergence (convergence almost everywhere, convergence with probability one, strong convergence) A random variable x_n converges to a constant c almost surely if the probability of observing a sequence that does not converge to c vanishes for n large enough. Formally, as n goes to infinity, lim Prob$[|x_i - c| > \varepsilon$ for all $i \geq n] = 0$ for all $\varepsilon > 0$. Almost sure convergence implies *convergence in probability.

alpha stocks The most actively traded securities in the *Stock Exchange Automated Quotation System. About 100 securities came into this category when it was in official use by the London Stock Exchange. These were shares of companies with high turnover and high *market capitalization. Alpha stocks had numerous *market-makers, and immediate publication of transactions in them was required. They were part of a system of categorization that also included beta, gamma, and delta stocks which were those of smaller companies, and less intensively traded.

altruism Selfless concern for others. Standard economic analysis assumes decision-makers are motivated by self-interest. This assumption is inconsistent with many observed economic choices such as contributions to charities that do not provide any direct benefit to the donor. The concept of altruism has been invoked to explain these observations. It is questionable whether altruism can be incorporated in an economic framework since, if there is any increase in utility from an act of altruism, the act cannot be purely selfless.

amalgamation *See* MERGER.