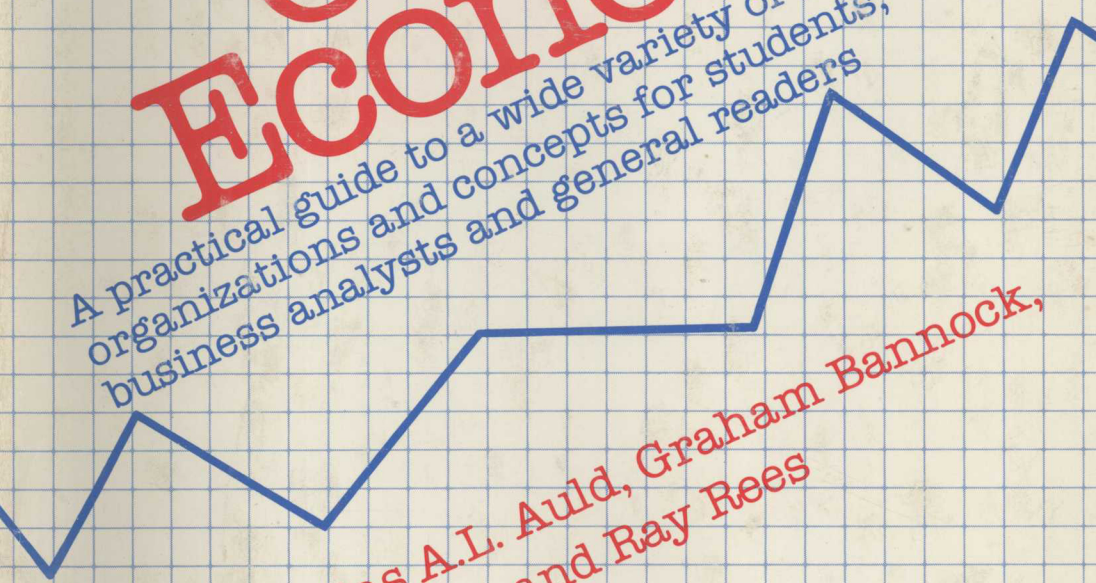


The American Dictionary Of Economics

A practical guide to a wide variety of economic terms,
organizations and concepts for students,
business analysts and general readers



Douglas A.L. Auld, Graham Bannock,
R.E. Baxter and Ray Rees

THE AMERICAN DICTIONARY OF ECONOMICS

Douglas A. L. Auld,
Graham Bannock,
R. E. Baxter and Ray Rees



Facts On File, Inc.
460 Park Avenue South
New York, N.Y. 10016

THE AMERICAN DICTIONARY OF ECONOMICS

Copyright © 1972, 1978, 1983 by Facts On File, Inc.

All rights reserved. No part of this book may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval systems, without permission in writing from the Publisher.

Portions of this book were originally published in *The Penguin Dictionary of Economics* (first edition, 1972; second edition, 1978).

Library of Congress Cataloging in Publication Data

Auld, Douglas A.L.

American dictionary of economics.

Rev. ed. of: *The Penguin dictionary of economics*/G. Bannock, R. E. Baxter and R. Rees. 2nd ed. 1978.

I. Economics—Dictionaries. I. Bannock, Graham. Penguin dictionary of economics.
II. Title. HB61.B38 1982 330'.03'21 81-22052 ISBN 0-87196-532-1 AACR2

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

PREFACE

This book is intended as a companion and guide for college students of economics, for the general reader who wants to follow economic discussion in the media and as a professional tool for the growing number of readers who need a knowledge of the subject in their daily work.

Modern economics is to a surprisingly large extent the achievement of English-speaking scholars and since World War II, increasingly of Americans. This is not to belittle the contributions of the early French economists, others such as Warias (Switzerland) or the members of the Austrian School and distinguished contemporaries such as Myrdal (Sweden). But in contrast to other social sciences, such as psychology, in any list of internationally respected economists such as those included in this book, British and Americans heavily predominate. Even among the many distinguished economists born and long resident in continental Europe, it is striking that many of them, for example Marx, Schumpeter, Hayek and Leontieff, did most of their work in Britain or America.

There are, of course, several dictionaries of economics on both sides of the Atlantic. We have tried to make ours a distinctive combination of micro-encyclopedic treatment with extensive cross-referencing, up-to-date institutional material and a level approach that combines academic rigor with brevity and practical utility. This formula was pioneered in the *Penguin Dictionary of Economics*, first published in Britain in 1972. The authors are grateful to Penguin Books for agreeing to withdraw our book from sale in the United States and allowing us to adapt the basic concept for our American publishers, Facts On File, Inc. While there is less difference in British and American terminology in economics than in many other subjects, it was necessary to rewrite the book completely so as to give coverage to American institutions, statistical and other illustrative material, as well as to adopt American usage and spelling.

Economics is a big subject and we have necessarily been selective in our treatment of it. Words in everyday use are not included unless they have a specialized meaning in economics. Economic theory, including international, monetary and welfare economics, has been treated fairly comprehensively, and we have devoted a considerable amount of space to economic history. Individual economists are included only where, in our judgement, they have made a definable contribution to the body of economic thought as it exists today; their entries concentrate upon that contribution rather than upon biographical information. We have been particularly sparing in the inclusion of contemporary economists and acknowledge that many distinguished living members of our profession are omitted. We have included all the key terms used by econometricians and statisticians that have practical relevance as well as those used in business finance. Our treatment of financial and business economics, public finance, international trade and payments has been more selective still but,

institutions apart, we hope that nothing important has been omitted. Elaborate cross-referencing has been incorporated to avoid repetition and to make the book more useful as an educational aid.

We gratefully acknowledge the help of our publishers in preparing a complex manuscript and seeing it through the press. The authors would welcome comments from readers on errors or omissions for incorporation in future editions. We would like to thank Eveline van Sleightenhorst for her most capable and cheerful assistance.

September 1982

DA
GB
REB
RR

A Note on Cross-references

Cross-references appear frequently both within and after the entries in this book. Cross-references are set in small capital letters; those that appear in parentheses are of two types: A reference preceded by one arrow indicates *direct* amplification of the given entry. Double arrow cross-references simply complement the entry they appear under. Any reference that appears without parentheses in the text indicates that the dictionary contains an entry on the particular concept, person, theory, etc.

The Editor

THE
AMERICAN
DICTIONARY
OF ECONOMICS

A

Above the line. Promotional expenditure incurred by a firm on selling its products or services by means of direct ADVERTISING, such as through television commercials, newspaper advertisements and posters. Below-the-line expenditure includes all other promotional sales expenditure, such as that incurred by special offers, free gifts and in-store displays.

Abstinence theory of interest. \Rightarrow INTEREST, ABSTINENCE THEORY OF

Accelerated depreciation. \Rightarrow CAPITAL ALLOWANCES

Acceleration principle. The hypothesis that the level of INVESTMENT varies directly with the rate of change of output. Given technological conditions, and the relative prices of CAPITAL and LABOR, a certain size of CAPITAL STOCK will be chosen to produce a particular rate of output. If this rate of output should change, then, other things being equal, the desired size of the capital stock will also change. Since net investment is, by definition, the amount by which capital stock changes, it follows that the amount of investment depends on the size of the change in output. At its simplest, the hypothesis asserts that investment will be proportional to the rate of change of output, at all levels of output. However, under more realistic assumptions the relationship may cease to be a simple proportional one. There may, for example, be spare capacity over some range of increasing output, so that the capital stock does not have to be increased until full capacity is reached; or the capital intensity (\Rightarrow CAPITAL INTENSIVE) of production may vary as the level of output varies. In addition, the relation will be influenced by EXPECTATIONS, time lags, etc. As well as being very important in explaining the determination of investment expenditure in the economy, the acceleration principle also plays an important part in theories of the TRADE CYCLE, e.g. the ACCELERATOR-MULTIPLIER MODEL, and the theory of ECONOMIC GROWTH, e.g. in the HARROD-DOMAR MODEL. ($\Rightarrow\Rightarrow$ ACCELERATOR COEFFICIENT; CLARK, JOHN MAURICE; INVENTORY INVESTMENT CYCLE).

Accelerator coefficient. The amount of additional CAPITAL STOCK required to produce a unit increase in sales. A key element in the ACCELERATION PRINCIPLE, this is the coefficient which relates the level of INVESTMENT to the change in sales. Thus, if I_t is investment in time period t , and Y_t and Y_{t-1} are output in times t and $t-1$ respectively, then we have: $I_t = V(Y_t - Y_{t-1})$, where V is the accelerator coefficient. Thus, the value of V tells us the strength of the effect that a change in output or sales will have on the level of investment. The simplest form of the theory takes V as a constant determined basically by technology. However, we might also expect V to be affected by interest rates, wage rates and the CAPACITY UTILIZATION RATE. (\Rightarrow CAPITAL-OUTPUT RATIO, INCREMENTAL).

Accelerator-multiplier model. A MODEL of the TRADE CYCLE based on the interaction of the ACCELERATION PRINCIPLE and the MULTIPLIER. A change in INVESTMENT causes, through the multiplier, change in NATIONAL

ACCELERATOR-MULTIPLIER MODEL

INCOME. This change in national income determines, through the acceleration principle, a level of **INVESTMENT**. If this level is different from the level previously attained, there is a further change in investment, a further change in income and so on. It is possible to show by a mathematical analysis of this process that it may cause national income to vary cyclically over time. (⇒ **SAMUELSON, PAUL ANTHONY**).

Accelerator theory of investment. ⇒ **ACCELERATION PRINCIPLE**

Account. A record of financial transactions in the form of **STOCKS** or flows. (⇒⇒ **BALANCE OF PAYMENTS; BALANCE SHEET; CURRENT ACCOUNT; SOCIAL ACCOUNTING**).

Accounting equation. ⇒ **BALANCE SHEET**

Accounting Principles Board (A.P.B.). ⇒ **INFLATION ACCOUNTING**

Accounts payable. ⇒ **TRADE CREDIT**

Accruals. ⇒ **ACCRUED EXPENSES**

Accrued expenses. The cost of services utilized in advance of payment and written into a company's accounts as **LIABILITIES**.

Accrued income taxes. Liabilities for **CORPORATION INCOME TAX** on profits earned. Since the government does not require payment of taxes until some time after the profits upon which they are levied arise, these tax reserves provide a continuing source of funds for profitable companies.

Acid test ratio. ⇒ **"QUICK" RATIO**

Activism. An explicit government policy changing tax rates or tax laws in an attempt to stimulate **AGGREGATE DEMAND** in a **RECESSION** and curtail it in a period of boom. (⇒ **STABILIZATION POLICY**).

Adaptive expectations. The hypothesis that future expected events are based on actual events of the past. The concept is most widely used in terms of price expectations.

Administered prices. Prices which are set consciously by a single decision-making body, e.g. a **MONOPOLY** firm, a **CARTEL** or a government agency, rather than being determined by the free play of **MARKET** forces.

Ad valorem tax. ⇒ **TAX, AD VALOREM**

Advance. Loan. ⇒ **BANK LOAN**

Advanced country. A state with high levels of income per person. Unlike a **DEVELOPING COUNTRY**, an advanced country is highly industrialized.

Advertising. The publicizing of goods and services, in the attempt to provide potential buyers with information about prices, availability and qualities of products in as persuasive a way as possible. It is clear that for a given **MARKET** to work effectively, buyers must be well-informed, and advertising has an important role to play in the information process. However, some economists argue that advertising, because it is supplied by the sellers of products, leads to distortions. There is likely to be an oversupply of advertising in that more advertising messages are produced than consumers would be prepared to pay for if they were sold separately; but since consumers are forced to pay for advertising in the form of higher-priced goods, they have no choice. Opponents of this view point to the failure of lower-priced, non-advertised products, e.g., supermarkets' "own brands," to replace the

more expensive advertised products as evidence that consumers prefer advertised goods, and suggest that opposition to advertising stems, therefore, from paternalistic disapproval of the "irrationality" of consumers. There may also, of course, be biases in the information presented to buyers, and the true information content of advertising messages may be low, with a preponderance of devices to exploit consumer psychology in ways favorable to the product. This may explain the growth of new information sources such as magazines providing objective information on a wide range of products. The effects of advertising on the degree of competition (\Rightarrow PERFECT COMPETITION) in a market have also been extensively analyzed. It has been suggested that advertising may lead to greater concentration in an industry, partly because it is an instrument of *product differentiation* (\Rightarrow DIFFERENTIATION, PRODUCT) and also partly because it may enable a firm to achieve ECONOMIES OF SCALE and so undercut its rivals. Advertising may also increase the BARRIERS TO ENTRY into an industry, since a new firm may have to incur heavy expenditures to overcome existing brand loyalties. There is a strong presumption among many economists that advertising tends to be excessive in consumer-oriented oligopolistic industries (\Rightarrow OLIGOPOLY), such as household detergents, drink and tobacco. In some respects, advertising can be thought of as a system, organized by businessmen, whereby consumption of the outputs of the mass media is subsidized from the proceeds of a tax (the advertising appropriation) on the consumption of goods.

Agency for International Development (AID). A U.S. Government Agency that carries out programs designed to assist DEVELOPING COUNTRIES make optimum use of their human and economic resources. The Foreign Assistance Act of 1961 directed the Secretary of State to establish the agency. Its functions are carried out under the direction of an administrator who reports to the President and the Secretary of State. The central office is in Washington, D.C., with missions and offices in several countries overseas. The aid programs involve food supply and storage facilities, population and health planning, educational programs and a variety of forms of technical assistance.

Aggregate demand. The total DEMAND for goods and services in the economy. It is conventionally broken down into: (a) the demands of HOUSEHOLDS for consumer goods and services; (b) the demands of firms and the government for investment goods (\Rightarrow CAPITAL); (c) the demands of both federal and state governments for goods and services; and (d) the demands of consumers and firms in other countries for goods and services in the form of EXPORTS. Since aggregate demand determines the level of production and hence employment, analysis of the determinants of these components of aggregate demand is the core of the Keynesian (\Rightarrow KEYNES, JOHN MAYNARD) analysis of NATIONAL INCOME and employment determination. (\Rightarrow EMPLOYMENT, FULL; \Rightarrow SOCIAL ACCOUNTING).

Aggregate supply. The total SUPPLY of goods and SERVICES in the economy available to meet AGGREGATE DEMAND. It consists of domestically produced goods and services plus IMPORTS.

AGGREGATION PROBLEM

Aggregation problem. ⇒ CAMBRIDGE SCHOOL

Allen, Sir Roy George Douglas (1906–). Educated at Sidney Sussex College, Cambridge, England, Sir R. G. D. Allen began lecturing at the London School of Economics in 1928. During the Second World War he moved from the U.K. TREASURY to Washington as Director of Records and Statistics of the British Supply Council and of the combined Production and Resources Board. In 1944 he was appointed Professor of Statistics at London University, a position he held until 1973. His publications include *Mathematical Analysis for Economists* (1938), *Statistics for Economists* (1949), *Mathematical Economics* (1956) and *Macro-Economic Theory—A Mathematical Treatment* (1967). In 1934 he published an article in *Economica* with Sir JOHN RICHARD HICKS which demonstrated the use of the INDIFFERENCE CURVE based on ORDINAL UTILITY as an analytical tool in the theory of consumer behavior. (⇒⇒ SLUTSKY, EUGEN).

Amalgamation. Synonym for COMBINATION.

American banking systems. ⇒ FEDERAL RESERVE SYSTEM

American Federation of Labor (AFL). The basis for craft unions in the United States whereby workers are joined in association or union based on their skills, not their employer or place of work. It was founded by Samuel Gompers in 1886 and reached a peak membership of 10 percent of the labor force in 1920. In the 1930s the industrial unions in steel and automobiles split from the AFL and formed the CONGRESS OF INDUSTRIAL ORGANIZATIONS (CIO).

American selling price. ⇒ GENERAL AGREEMENT ON TARIFFS AND TRADE

American Stock Exchange. One of two major U.S. STOCK EXCHANGES where STOCKS and BONDS are bought and sold publicly. The other major exchange is the New York Stock Exchange.

Amortization. Provision for the repayment of DEBT by means of accumulating a “sinking fund” through regular payments which, with accumulated INTEREST, may be used to settle the debt in installments over time. A sinking fund may be required by law, as in the case of some public utilities bond issues, or it may be set up by the borrower as a matter of financial prudence. The term is also used to refer to regular capital repayments on loans as in a house MORTGAGE and as a synonym for DEPRECIATION.

Andean Pact. A common market established, by the Cartagena Agreement in 1969, among Chile, Peru, Colombia, Bolivia and Ecuador. Venezuela joined the Pact in 1973, but Chile terminated its agreements in 1976. The aims of the group include the establishment of a common external tariff (⇒ TARIFFS, IMPORT), the freeing of trade among member countries and a policy for the rational development of specific industries on a regional basis. Tariffs on manufactured goods have been virtually eliminated among member countries, except for Ecuador and Bolivia, which have been given a further 10 years to adjust. (⇒ LATIN AMERICAN FREE TRADE ASSOCIATION).

Annuity. 1. A constant annual payment. 2. A guaranteed series of payments in the future purchased immediately for a lump sum. Annuities are described as “certain” where payment is specified for a fixed number of years. A

"life" annuity payment continues until the death of the person for whom it was purchased. Annuities may be "immediate," where payment commences on purchase, or "deferred," where payment starts at a specified future date. Annuities are available from insurance companies, whose pension schemes (\Rightarrow PENSION FUNDS) are often annuities purchased with accumulated contributions and EARNINGS on the funds in which they are invested. The price of an annuity is based on the PRESENT VALUE of the stream of income payments it provides, and it varies with RATES OF INTEREST and, in the case of life annuities, the age and sex of the person who will draw the annuity.

Anti Inflation Board (A.I.B.). In order to combat rising wage and price inflation, the Canadian government established a comprehensive PRICES AND INCOMES POLICY in October 1975. The A.I.B. was the agency established to conduct the policies laid down in Parliament. The major instrument assigned to the Board was the power to roll back wage settlements, although there was some control over profits as well. The Board was disbanded in the fall of 1978 without having achieved its specific goal. The evidence suggests, however, that the Board was successful in reducing wage inflation.

Anti-Merger Act. \Rightarrow CELLER-KEFAUVER ACT

Antitrust Division. The division within the U.S. Department of Justice that initiates court action against companies that are believed to have violated laws with respect to MERGER, MONOPOLY and PRICE DISCRIMINATION.

Antitrust policy. The foundation blocks of U.S. antitrust policy are the SHERMAN ANTITRUST ACT, CLAYTON ANTITRUST ACT and the FEDERAL TRADE COMMISSION. The two acts of Congress and subsequent amendments such as the CELLER-KEFAUVER ACT provide the legal basis for public policy against trusts, cartels and other forms of the abuse of monopoly power (\Rightarrow CARTEL; TRUST), such as PRICE DISCRIMINATION, EXCLUSIVE DEALING and TYING CONTRACTS.

Prior to 1914, it was generally recognized that an agency was needed to oversee antitrust policy. This concern led to the creation of the Federal Trade Commission. Today, the Commission and the Antitrust Division of the Department of Justice share the responsibility for enforcement of the laws governing business behavior. The Antitrust Division is almost exclusively an investigative and enforcement board. If it proceeds with an antitrust charge, the case is heard before a federal district court. While the Federal Trade Commission does research, it can prosecute cases and issue cease-and-desist orders against corporations when their business policies are found by administrative law judges to violate antitrust laws.

Over the years, the interpretations by the courts with respect to violations against the Sherman and Clayton Acts have led to the conclusion that both the Justice Department and the Federal Trade Commission may bring civil actions against those suspected of violating the Acts. In either case, appeal is to the Supreme Court. The success of U.S. antitrust policy is impossible to measure because of the lack of any specific criteria of optimal business behavior. There seems little doubt that without the ghost of Senator Sherman at the board table, the degree of monopoly and the abuse of that power would be more widespread than it is at present.

APPRECIATION

Appreciation. Increase in the value of an ASSET; the opposite of DEPRECIATION. Appreciation may occur through rising PRICES as a result of INFLATION, increased scarcity or increased earning power. (\Rightarrow CURRENCY APPRECIATION).

Arbitrage. 1. The practice of switching short-term funds from one INVESTMENT to another in order to obtain the best return. An arbitrage flow of funds will take place between two financial centers if the difference in their RATES OF INTEREST is greater than the cost of covering against the currency exchange RISK. The latter is reflected in the difference between the spot exchange rate and the forward exchange rate (\Rightarrow FORWARD EXCHANGE MARKET; SPOT MARKET). The source of these arbitrage flows may come from dealers who specialize in this business. Arbitrage may also take place between BONDS or NOTES with different maturity dates when interest rates diverge. Arbitrage in itself is not speculative. For instance, there are two alternative methods for the holder of U.S. dollars to speculate on an appreciation (\Rightarrow EXCHANGE RATE) of the French franc. The first is to buy francs spot in Paris and invest in bonds on the Paris market; the second is to buy forward francs and invest dollars in the New York market. The choice will depend on the actual interest rates prevailing in each market. 2. When price differences exist within any MARKET, the act of buying at the lower price and reselling at the higher price is known as arbitrage. The effect is to eliminate the price difference, and so arbitrage forms part of the process by which EQUILIBRIUM is reached. (\Rightarrow PERFECT COMPETITION; PRICE DISCRIMINATION).

Arithmetic progression. A series of numbers in which each value differs by a constant from that of the preceding value, e.g., $x, (a + x), (2a + x), \dots (an + x)$. (\Rightarrow GEOMETRIC PROGRESSION).

Arrow, Kenneth, J. (1921–). Professor Arrow received his M.A. and Ph.D. from Columbia University. From 1947 to 1949 he was a research associate at the Cowles Commission. He went to Stanford University in 1949 and remained there until his move to Harvard in 1968. Much of Arrow's scientific research has been concerned with proofs of the existence and stability of GENERAL EQUILIBRIUM and with how the economic system operates to achieve optimal resource allocation (\Rightarrow ECONOMIC EFFICIENCY). He has applied to economic theory modern mathematical concepts, and helped transform the nature of mathematical economics. The research of Arrow has stressed the role of decentralization as a means of achieving optimal resource allocation. Professor Arrow's work has also encompassed the subject of the SOCIAL WELFARE FUNCTION and he is widely known for his IMPOSSIBILITY THEOREM. Among his many publications are *Social Choice and Individual Values*, 1951, 1963, (based on his doctoral dissertation); *Public Investment, The Rate of Return and Optimal Fiscal Policy* (with M. Kurz), 1972; *Essays in the Theory of Risk-Bearing*, 1971. Professor Arrow received the Nobel Prize (\Rightarrow NOBEL PRIZES) in Economics in 1972.

Arusha Agreement. \Rightarrow LOME CONVENTION

Asian Development Bank (A.D.B.). The Bank was set up in November 1966 following the recommendations of the United Nations Economic Commission for Asia and the Far East. It was formed "to foster economic growth

and cooperation in the region of Asia and the Far East and to contribute to the acceleration of economic development of the DEVELOPING COUNTRIES of the region." It encourages economic and financial cooperation among the regional members. Membership carries the right to contract for projects supported by bank loans. About 60 percent of the total subscribed CAPITAL of \$1,100 million was contributed by the 19 countries within the United Nations commission region, which include the developed countries of Japan, Australia and New Zealand. The remaining non-regional members include the United States, which subscribed \$200 million (as did Japan), West Germany, Canada, the United Kingdom and Switzerland. In 1976, by which year subscribed capital had increased to \$3,700 million, agreement was reached which raised this figure to \$8,800 million. The bank operates as a viable BANKING institution, charging realistic RATES OF INTEREST, and encouraging a flow of capital to the region from outside sources. (⇒ CO-LOMBO PLAN; INTER-AMERICAN DEVELOPMENT BANK).

Assets. An accounting term. On a company's BALANCE SHEET, everything it owns or leases and which has a money value is classified as an asset, total assets being equal to total LIABILITIES. Assets fall into the following categories, roughly in the order of degree to which realizing their money value would disrupt the company's business: (a) *Current assets*: CASH, bank deposits and other items that can readily be turned into cash, e.g., accounts receivable (⇒ TRADE CREDIT), marketable SECURITIES, INVENTORIES, PREPAYMENTS. (b) INVESTMENT in subsidiary or associated companies and other not readily marketable securities, or securities being held for long term gain. (c) *Fixed assets*: LAND, buildings, plant and machinery, vehicles, furniture and equipment. With the exception of land these assets are called *depreciable assets* and are usually written in at cost, less DEPRECIATION. (d) *Intangible assets*: goodwill, patents, etc. The assets of an individual are those possessions or the liabilities of others which to him have a positive money value.

Association of South East Asian Nations (A.S.E.A.N.). An association of five DEVELOPING COUNTRIES in Southeast Asia, and comprising Indonesia, Malaysia, the Philippines, Singapore and Thailand. In 1976, the Association agreed to cooperate on industrial projects in petrochemicals, fertilizers, steel, soda ash, newsprint and rubber, and to assist one another in the construction of major plants. The Association also set up a permanent secretariat. Progress in developing joint projects has been slow but, in 1980, it was agreed to relax the rule that all the countries must participate in each project. The Association has an emergency oil sharing scheme to assist any member country whose supplies fall significantly short of requirement.

Assurance. That branch of insurance under which a contract is made to pay a CAPITAL sum on a specified date or on the death of the person assured.

Atomistic competition. The type of MARKET STRUCTURE in which very large numbers of small firms compete independently. (⇒⇒ PERFECT COMPETITION).

AUSTRIAN SCHOOL

Austrian school. A tradition of economic thought originating in the work of CARL Menger (1840–1921), who was Professor of Economics at Vienna until 1903. He was succeeded in the Chair by F. VON WIESER (1851–1926) and E. BÖHM-BAWERK (1851–1914). Menger's principal achievement was the construction of a marginal utility theory of value (\Rightarrow VALUE, THEORIES OF). His work was developed by Von Wieser, who, in addition, clearly formulated the important concept of opportunity COST. Böhm-Bawerk's main contributions were in the fields of CAPITAL and interest rate theory (\Rightarrow RATE OF INTEREST). The Austrian tradition was followed in the work of L. E. VON MISES, F. A. HAYEK, and J. R. HICKS. ($\Rightarrow\Rightarrow$ JEVONS, WILLIAM STANLEY; LONGFIELD, SAMUEL MOUNTFORT).

Auto-correlation. CORRELATION between the error terms in a regression model (\Rightarrow REGRESSION ANALYSIS). Its effect is to invalidate one of the assumptions underlying the ordinary least squares procedure (\Rightarrow LEAST SQUARES REGRESSION), and thus to make it necessary to modify that procedure. It is often called serial correlation.

Automatic stabilizer. \Rightarrow BUILT-IN STABILIZERS

Automatic transfer service (ATS). An arrangement permitting a depositor to transfer funds from TIME DEPOSITS to DEMAND DEPOSITS in order to honor checks written on the account. (\Rightarrow BANKING; NOW ACCOUNT).

Autonomous investment. The portion of total INVESTMENT that is not determined by economic factors such as the RATE OF INTEREST, the rate of change of sales, or the profitability of investment, but rather by factors that are considered outside the economic system (\Rightarrow EXOGENOUS VARIABLE). An example would be investment made to take advantage of some INNOVATION or technical discovery. The importance of autonomous investment in economic theory is that changes in it may spark economic fluctuations, and may influence the behavior of the TRADE CYCLE in ways that are not explained by MODELS based on investments understood in terms of endogenous factors (rate of interest, rate of change of sales, etc.).

Average. A single number meant to represent a set of numbers, by showing a "central" value around which the other numbers are grouped. The average wage of a group of workers, for example, suggests the wage those workers typically tend to earn. Necessarily, some or even all the numbers may differ from the average—a worker may never earn his "average" wage (cf. the statement, the average number of persons per HOUSEHOLD in the United States is $2\frac{1}{3}$). Nevertheless, the average is useful; it reveals the value about which the actual numbers are closely grouped, or, as statisticians say, a measurement of the "central tendency" of the data.

There are in fact several ways to calculate an average from a set of numbers, and the different ways frequently yield different values. It is misleading to say "the average . . . is" without specifying the type of average being used. The types of average in common use are:

(a) *The arithmetic mean:* This is the "average" most often seen in everyday use: a set of numbers is summed, and the answer divided by the number of numbers. The "mean" wage of a group of 500 workers, for

example, is found by summing their individual wages, and dividing by 500. The mean gives a good representation of the typical values of the numbers when the numbers are somewhat closely clustered and there are no values very much greater or very much smaller than the rest. If such extreme values are present, the mean tends to give an inaccurate representation of the numbers' typical values. As an example: the mean weekly wage of five men, earning respectively, \$150, \$170, \$180, \$200 and \$200 is given by:

$$\left(\frac{150 + 170 + 180 + 200 + 200}{5} \right) = \$180 \text{ p.w.}$$

However, if the fifth man earned \$550 per week, the mean wage would be \$250 per week, which is much less representative of the set of numbers as almost all the other wages were considerably less. Hence, in this case the mean would not be very useful.

Certain types of data frequently exhibit such extreme values—wages and incomes (\Rightarrow INCOME DISTRIBUTION), size of firms in an industry (\Rightarrow SIZE DISTRIBUTION OF FIRMS), size of cities in a country, etc.—that the mean is often rejected as the appropriate measurement, and other methods of averaging are used.

Note also that the usefulness of the mean depends on how *closely* the numbers are grouped around it. In the example given above, the actual wages approximate the mean of \$180. However, suppose the wages of the five men were \$80, \$110, \$180, \$260 and \$270. The mean is again \$180 per week, but it is a less typical value because the numbers are more widely dispersed. In fact, whenever a mean value is given, it should be accompanied by a measure of how closely or widely the surrounding numbers are dispersed (\Rightarrow STANDARD DEVIATION; VARIANCE).

(b) *The median*: A type of average often used when the mean is inappropriate. The median of a set of numbers is that number which is surrounded by an equal number of values that are less than it and greater than it is. To find the median, the set of numbers is first arranged in ascending order of size. If the number of values in the set is odd, the median is immediately established as the middle number. (In the five values in the set of wage rates given above, the middle value is the third number, i.e., \$180.) On the other hand, if the number of values is even, none of those values is the "middle number." The solution then is to take the mean of the adjacent central values (the second and third when there are four numbers, the 10th and 11th when there are 20 numbers, and so on), as the median. To illustrate: suppose the set of wage rates contains the four numbers \$150, \$170, \$180 and \$200. The two middle numbers are \$170 and \$180. Their mean is $\$ \left(\frac{170 + 180}{2} \right) = \175 . Hence, \$175 is the median wage rate, with two numbers below it (\$150 and \$170) and two above it (\$180 and \$200). In short, the middle value of the set is taken as typical or representative of the whole set. Unlike the mean, the median ignores extreme values. Thus, in the case where the fifth wage rate was \$550 per week, the median would still

AVERAGE

be \$180 per week, whereas the mean would rise to \$250 per week. In fact, we could make the two values above the median as high as we liked, or the values below the median as low as we liked: as long as the number of values is five, the median is \$180 and remains unchanged. It follows that, when there are extreme values among the higher values in the set, the mean tends to pull above the median; when there are extreme values among the lower values in the set, the mean tends to pull below the median. In each of these cases, the median is apt to give a more accurate representation of the data.

(c) *The mode*: This is the value in the set of numbers that occurs most frequently. Thus, in the set \$150, \$170, \$180, \$200 and \$200, the mode is \$200. If the last \$200 was deleted, the set would have no mode. If, however, the set of numbers was increased to six by adding a value of \$150, it would have two modes (it would be “bi-modal”), one of \$150 and one of \$200. The mode can be of interest for its own sake: it may be interesting to know what wage is earned most frequently, the size of family encountered most often, etc.

(d) *The geometric mean*: This is calculated as the n th root of the product of n numbers. Thus, the geometric mean of 1 and 4 is $\sqrt{1 \times 4} = \sqrt{4} = 2$. Similarly, the geometric mean of 1, 2, 3, 13.5 is $\sqrt[4]{1 \times 2 \times 3 \times 13.5} = \sqrt[4]{81} = 3$. The geometric mean is chiefly used in calculating average growth rates over a period of time. Although this method of calculating the geometric mean could be cumbersome when the number of growth rates is large, the procedure is simplified by noting that the logarithm of the geometric mean is found by taking the arithmetic mean of the logarithms of the growth rates. ($\Rightarrow \Rightarrow$ WEIGHTED AVERAGE).

Average cost. Production COST per unit of output produced. It is calculated by dividing total cost of production by the number of units of output. SHORT-RUN average cost relates to the cost of production during a time period when at least one FACTOR OF PRODUCTION is fixed in quantity. For example, it may take a year for a firm to plan, order and install new machinery; during this period the firm will be constrained to use only its existing stock of machines. LONG-RUN average cost relates to the cost of production during a time when all factors of production can be treated as variable. For example if the firm, by planning now, can determine the amount of each factor of production it will have available in one year's time, it can plan its future production on the basis that all inputs are variable in quantity. It follows that when planning production for the long run the firm can choose the most efficient set of input quantities, i.e., that set which minimizes production cost. In the short run, however, the firm may be unable to attain these least-cost input quantities because of the constraint that at least one input cannot be changed. As a result average cost in the short run will be higher than average cost in the long run, *unless* the fixed input quantities are in fact the ones the firm would have chosen had it been free to do so.

Average cost pricing. The method of establishing prices in which PRICE is set equal to AVERAGE COST. Since total revenue is equal to price multiplied by quantity, and total cost is equal to average cost multiplied by quantity,