DEMAND THEORY AND ECONOMIC CALCULATION IN A MIXED ECONOMY

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BY

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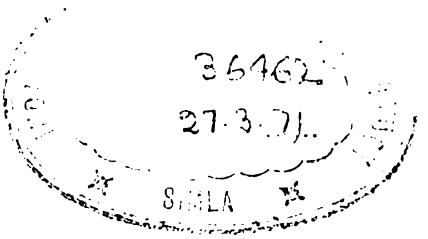

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This book is based on a doctoral dissertation approved by the University of London. The first part dealing with the Pure Theory of Demand makes use of material embodied in a comprehensive history of the theory, in both its micro and macro forms, which is expected to be published shortly. The second part discusses the usefulness of the micro theory of demand in a mixed economy. The need for some corrective to the excessive reaction against the theory and a balanced evaluation of its utility is emphasized in conclusion.

I am indebted to Dr M. E. A. Bowley, Professor B. R. Williams and Professor A. W. Stonier under whose supervision the first draft of the present work was prepared as a doctoral dissertation; to the University of Manchester for the award of a Hallsworth Fellowship which enabled me to complete this work; to Mr J. P. Lewis, Mr J. Coppock, Mr A. Lerner, Dr K. Martin, Dr J. K. Ghandhi and Dr D. Usher for many valuable suggestions; and to Professor C. F. Carter and Mr H. Tout who took a kind interest in my work and helped me in various ways to continue it.

I should also like to put on record my deep gratitude to my friend, Mr T. Richmond, but for whose continuous help and encouragement this work could not have been written.

CONTENTS

LIST OF ABBREVIATIONS USED

AER	*American Economic Review*
ED & CC	*Economic Development and Cultural Change*
EJ	*Economic Journal*
IEP	*International Economic Papers*
IER	*Indian Economic Review*
JPE	*Journal of Political Economy*
JRSS	*Journal of the Royal Statistical Society*
JSP	*Journal of Social Psychology*
OEP	*Oxford Economic Papers*
QJE	*Quarterly Journal of Economics*
RES	*Review of Economic Studies*
RE & S	*Review of Economics and Statistics*
SEJ	*Southern Economic Journal*

INTRODUCTION

In many parts of the 'free world',[1] especially in underdeveloped countries that have adopted the technique of central planning (e.g. India), the feeling has grown over recent years that micro-economic analysis is not of much practical use to the economist. This view is not uncommon even among economists of relatively free market economies (like that of the USA) or of semi-Socialist countries (like Britain). Nevertheless this branch of economic science, known as 'pure', sometimes 'advanced', economic theory—a legacy from the pre-Keynesian generation of economists that was largely occupied with explaining the behaviour of the individual as a consumer and/or as a producer rather than with the behaviour of the economy—takes up a significant part of the university syllabi. It is not unreasonable to postulate that many underdeveloped countries will probably develop the same framework of economic organization and policy as underlies India's recent development plans. In these circumstances such questions as the one posited above, namely 'what use can we make of economic theory?' are bound to be asked. After all, economics is a social science and to be useful its theory must be related to day-to-day economic problems. Apart from these practical considerations, an inquiry that investigates the significance of any such important branch of economic science must be considered worthwhile on academic grounds alone.

Our inquiry is restricted to a part only of what is included normally under the general heading of 'micro economic theory', viz. the Theory of Demand. Our treatment falls into two distinct parts. In Part I we present what may be regarded as the essentials of the micro theory of demand. This is necessary because an extended comment has been forthcoming on demand theory in recent years and its substance is not easily available except to a specialist in the field. Two recent surveys,[2] both very ably compiled, emphasize the 'psychological' and 'mathematical' components of the discussion; but they hardly touch what may be regarded as the 'economic core' of the issue. Dr Tapas Majumdar's 'Measurement of Utility'[3] is a competent reporting of some aspects of the recent debate on the subject but, since his analysis is oriented towards welfare economics and methodology, his study does not cover the entire field.

[1] The adjective 'free' has no ethical or political connotation here. It is used in the strictly conventional sense of the free market economy.

[2] Ward Edwards, 'The Theory of Decision Making', *Psychological Bulletin*, July 1954, pp. 380–417. Herbert A. Simon, 'Theories of Decision-Making in Economics and Behavioural Sciences', *A.E.R.*, June 1959, pp. 253–83.

[3] Macmillan & Co. Ltd. (London), 1958.

The ground covered in our Part I may be identified as the analysis of the logical foundations of demand theory. The three hypotheses that are considered are 'Utility', 'Indifference' and 'Revealed Preference'. The discussion is integrated so that the subject matter can take on the unity of a single doctrine. What is discussed here is not the Theory of Consumer's Behaviour in its fullest generality and complexity but only that part of it which opens a route to the Law of Demand. Thus the Theory of Consumption is left aside (*à la* Marshall).[1] This is in accordance with the established procedure. For much that is of interest in the Theory of Consumption is the analysis of 'wants' and 'activities'. Since the character of demand analysis is 'static' (based as it is on the constancy of the consumer's tastes) and any adequate discussion of wants and activities must run along dynamic lines, any attempt to integrate the Theory of Consumption with the Theory of Demand (or vice versa) would appear contrived. This means that while we are not investigating the laws of development of wants, changes in the system of tastes are not necessarily excluded from demand analysis.

Having put the micro theory of demand on what we consider to be its main bases, the next question to be asked is whether or not it is of any use. This is done in Part II. Here we have adopted the assumption of a 'mixed economy'. This procedure is novel as it involves a divorce of economic theory from the usual assumptions of a 'free enterprise' (or 'capitalistic') economy. But nevertheless such a procedure is useful, as a large part of the 'free world' is tending to move towards a 'mixed economy' pattern in which neither of the two main sectors, 'private' or 'public', is insignificant. This is especially true of an underdeveloped country in which economic growth is being directed and stimulated through national planning.

[1] *Principles of Economics* (1890), 8th ed., 1920, pp. 90–1.

PART I

Chapter 1

MARGINAL UTILITY ANALYSIS

The logical theory of demand derives from three different bases: marginal utility hypothesis, indifference-preference hypothesis and revealed-preference hypothesis. Although the theories based on the latter two hypotheses, which use more scientific techniques, have gained ground considerably during the last twenty-five years or so, the theory based on the marginal utility hypothesis has by no means fallen completely into disfavour. In the present chapter we introduce the formulation of the theory of demand in terms of utility whereas chapters 3 and 4 do so in terms of indifference-preference and revealed-preference hypotheses respectively. Chapter 2 is a critique of the marginal utility analysis and emphasizes the need for the further development of demand theory.

II

It may be pointed out at the outset that, in the traditional economics, the utility hypothesis provides not only the logical basis for the theory of demand but also for a large part of welfare economics. The latter, though more significant (in view of the economist's ceaseless interest in the formulation of economic policies) and recently more widely discussed, was historically a by-product of the application of the utility hypothesis to the theory of demand.

The method of utility theorists is abstract and deductive. They make assumptions about the behaviour of the individual consumer and his economic environment and from these assumptions they deduce theorems. Though some attempts have been made to fit these theorems with statistical data, the difficulty of obtaining data about the consumer's decision-making process, especially his utility calculations, has made the problem of testing and verifying seemingly intractable.

The principal focus of the theory is on the individual consumer.

This economic actor—he is no other than the classical mythological figure of 'economic man', in a new dress—has the following properties.

First, he is a composite consumption unit made up of several individuals, generally the family. This practice is only an analytical convenience. But it is not unrealistic as in most households the function of economic decision-making is usually performed by one single individual, the housewife or the male head of the family. This simplification implies that the utility functions of all the members of the household are similar to those of the decision-maker or do not count because, say, of immaturity of judgement. The alternative would be to work the model with an aggregate utility function involving the utility functions of all the individuals of the household. If the utility functions of the individuals are ascertainable and additive, this treatment poses only the mechanical problem of aggregation.

The second crucial fact about the consumer is that he is rational. This attribute involves several assertions about the consumer's psychology: (1) that he has a clear perception of utilities of various quantities of the objects of desire; (2) that these utilities are capable of measurement in money terms; (3) that the consumer can compare marginal utilities of various commodities of exchange; and (4) that of various alternatives the consumer will always choose the one which will give him maximum utility. The notion of maximization makes it possible for the theory to specify a unique alternative among those open to the consumer.

The word 'utility' is adopted to convey that 'abstract quality whereby an object serves our purposes, and becomes entitled to rank as a commodity'.[1] It does not savour of any ethical connotation. Anything, a loaf of bread or a jot of poison, is a commodity if it ministers to somebody's need. Menger asserted that for a thing to be a good (*Gut*), or for it to acquire a goods-character (*Güterqualität*), all four of the following conditions must co-exist:

(*a*) There must be a human need.
(*b*) The thing must have adaptability (or properties) to be placed in causal correlation with the satisfaction of this need.
(*c*) Man must recognize this need-satisfying power of the thing.
(*d*) Man must have sufficient control over the thing to make it subserve the given need.

Jevons distinguished three kinds of utility of an object:

(*a*) Actual, which means that the object is useful to some person at the present moment.

[1] W. S. Jevons, *The Theory of Political Economy* (1871), 2nd ed., 1879, p. 41.

(*b*) Prospective, which implies that the object, though not useful at the moment, is likely to become so at a future date.

(*c*) Potential, which means that the object would be useful if some person needing it could possess it.

The utility theory of demand is essentially a short-period theory. It eliminates the 'trend' by holding causes of variation constant. The utility theorists before Marshall did not care to introduce the qualifications necessary for the law of demand to hold good. But Marshall's device of impounding long-period variables in *ceteris paribus* has become traditional. Thus the price-quantity relationship in the law of demand is insulated from the effects of changes in (1) the tastes of the consumers, (2) the prices of substitutes and complements, and (3) the money income of the consumers.[1] The assumptions of stability of 'tastes' and 'income' are considered by most economists to be acceptable and quite appropriate to a short-period analysis. However, the assumption of constancy of the prices of related goods is implausible and provides a weak point of theory. Walras who was contemporary with Marshall did not have to make this assumption as he worked with the General Equilibrium method (of which he was the first and the chief exponent).

Further, there is a set of analytical assumptions. First, it is assumed that the consumer has a perfect knowledge of (*a*) the alternative choices open to him and (*b*) the consequences of his action in pursuing any of them. Secondly, it is assumed that all the quantities with which the economist has to deal (utilities, units of commodities, money income, price quotations, etc.) are infinitely divisible (the assumption of continuity and differentiability). Thirdly, it is assumed that the consumer is infinitely sensitive and therefore reacts to the smallest discernible change in his economic environment.[2] The purpose of the second and third assumptions is to make the functions 'continuous' and differentiable', and as Richard Stone has demonstrated in *The Role of Measurement in Economics* (1951) they can be relaxed without any harm to the theory.

There is one qualifying assumption which has become obvious due to the recent development of the theory of risky choices; that the alternatives open to the consumer are equally certain.

[1] An alternative interpretation of Marshall's demand curve was given by Milton Friedman (*J.P.E.*, December 1949, pp. 463–95). Friedman substitutes the 'real income' in place of the 'money income' in the list of 'other things the same'.

[2] This is true especially of those utility theorists who used mathematical methods; e.g. Bernoulli, Dupuit, Gossen, Jevons and Marshall. Menger made use of simple arithmetical tables but not of diagrams, equations, or any other mathematical means. He dealt with small, finite changes, rather than with infinitesimals; his schedules are irregular and always discontinuous. Walras worked both with continuous and discontinuous functions.

III

Once a careful choice of assumptions is made, the formulation of the theory of demand becomes relatively simple. Let us now consider any one of the many consumers in a market, an 'ideal consumer', and try to explain how he allocates his income to various consumer goods.

Consider the following data derived from hypothetical experiments:

(*a*) Money income which the consumer is prepared to spend on goods listed as item (*b*): £3 (=60 shillings) fixed.

(*b*) Goods which the consumer is interested in buying:

A(pples),
B(ananas) and
C(herries).

Consumption of all other goods is held constant.

Let us assume the following prices of A, B and C:

A, 1 shilling a lb.,
B, 1 shilling a lb., and
C, 2 shillings a lb.

Let us assume further that the marginal utility of money is constant at 1 shilling=5 utils.[1]

(*c*) Utility schedules of the consumer for these goods are as follows. These utility schedules are independent of prices and may be taken as a datum at a given moment of time.

The notion of utility underlying the theory of demand is at the heart of most of the recent controversies in the theory. It will be helpful therefore to discuss the broad outline of its structure at this stage.

In the first place (using the language of the psychologist), most utility theorists—and all of its chief exponents—based the theory on the assumption that utility can be measured on an interval scale.[2]

[1] 'Util' is a unit of measurement of utility adopted by Irving Fisher in his *Mathematical Investigations in the Theory of Value and Prices* (1892). See p. 18.

[2] Gossen's, Menger's and Marshall's position on this point is beyond doubt. There is some confusion—even in well-informed quarters—as to whether Jevons committed himself to the idea of measurement of economic quantities, the two chief being pleasure and pain, or utility and disutility. There can be difference of opinion as to how far he committed himself but not as to whether he did commit himself. He regards all economic notions—'pleasure, pain, labour, utility, value, wealth, money, capital, etc.'—as quantities all allowing of measurement.

Anticipating that his attempt to measure utility will be ridiculed, he makes reference (like Lloyd) to the vaguest notions that at one time prevailed about everything which was later rendered capable of exact measurement; measurement of heat, for instance. In economics, Jevons finds perplexity, not because of the

Quantity (lbs)	*Utility measured in utils*								
	of commodity A			*of commodity B*			*of commodity C*		
	TU	*MU*	*AU*	*TU*	*MU*	*AU*	*TU*	*MU*	*AU*
0	0	0	0	0	0	0	0	0	0
1	12	12	12	16	16	16	20	20	20
2	22	10	11	30	14	15	38	18	19
3	30	8	10	42	12	14	54	16	18
4	37	7	9.25	52	10	13	68	14	17
5	43	6	8.6	60	8	12	80	12	16
6	48	5	8	67	7	11.17	90	10	15
7	52	4	7.43	73	6	10.43	98	8	14
8	55	3	6.87	78	5	9.75	104	6	13
9	57	2	6.33	82	4	9.11	108	4	12
10	58	1	5.8	85	3	8.5	110	2	11
11	58	0	5.27	87	2	7.91	110	0	10
12	56	−2	4.67	88	1	7.33	108	−2	9
13	52	−4	4	88	0	6.77	104	−4	8
14	46	−6	3.29	86	−2	6.14	98	−6	7
15	35	−11	2.33	81	−5	5.4	90	−8	6

NOTE: *TU*=Total Utility. *MU*=Marginal Utility. *AU*=Average Utility.

Expressed in a more familiar language this means that utility is cardinal and can be expressed as a quantity (or magnitude). A quantity can be defined as anything that is estimable as greater or smaller than some other thing. This property implies 'transitivity'

lack of numerical data for estimating various magnitudes, but because of the abundance of it.

Nevertheless, Jevons shows awareness of the crucial problems, especially that of interpersonal comparisons of utility, involved in the direct measurement of the feelings which belong to the inscrutable realm of the human heart. It is to his credit that in his theory he repudiates comparisons between utility magnitudes experienced by different persons. He has frankly admitted that a unit of pleasure or of pain is difficult even to conceive, so that the numerical expression of feelings is out of the question. But he has no doubts that, indirectly, the comparative amounts of feelings can be estimated from the quantitative effects they produce. 'Just as we measure gravity by its effects in the motion of a pendulum, so we may estimate the equality or inequality of feelings by the decisions of the human mind. The will is our pendulum, and its oscillations are minutely registered in the price lists of the markets. I know not when we shall have a perfect system of statistics, but the want of it is the only insuperable obstacle in the way of making Economics an exact science.' (*The Theory of Political Economy*, pp. 12–13.)

Walras's position is similar to that adopted by Jevons. For a detailed discussion of Walras's views see H. K. M. Singh, Marie Esprit Léon Walras, *I.E.R.*, February 1958, p. 15n.

and 'asymmetry' but not 'measurability'. A quantity to be measurable must satisfy two additional requirements: (*a*) it should be possible to define a unit and (*b*) it should be possible to define increment operationally.

In the second place, the theory postulates the law of diminishing utility. Marshall who gave the theory a grand architectural form and framed most of its explanatory hypotheses has stated this law as follows:

'There is an endless variety of wants, but there is a limit to each separate want. This familiar and fundamental tendency of human nature may be stated in the law of satiable wants or of diminishing utility thus: The total utility of a thing to anyone (that is the total pleasure or other benefit it yields him) increases with every increase in his stock of it, but not as fast as his stock increases.'[1]

Pointing to certain exceptional circumstances,[2] Marshall argued that the law applied to all objects of desire, including money. Since money represents purchasing power over all other commodities, the marginal utility of money, as a rule, is never zero. (The utility curve of money tends to be an asymptote to the quantity axis but never intersects it.) The statement that 'there is a limit to each separate want' implies that in the consumer's commodity plane there is a saturation point for every commodity of consumption (except money).

In the third place, the utility school assumed that the utility of any commodity is a monotonically increasing negatively accelerated function of the quantity of that commodity alone.

Finally, the assumption that while the marginal utility of the commodities which the individual purchaser is exchanging for money changes, that of money 'is the same throughout'. This assumption was introduced into economic analysis in 1730 by Daniel Bernoulli.[3] Since Marshall took it over from Bernoulli and introduced it in his 'Principles', it became a standard assumption of the theory.[4] The assumption was justified by Marshall as an analytical

[1] *Op. cit.*, p. 93. While Marshall's formulation appears to exclude negative utility, Bernoulli, Gossen and Jevons introduced it explicitly in their theories. (See Daniel Bernoulli, 'Exposition of a New Theory on the Measurement of Risk' (1730), translated from Latin into English by Louise Sommer, *Econometrica*, January 1954, pp. 23–36; H. H. Gossen, *Entwickelung der Gesetze des menschlichen Verkehrs und der darausfliessenden Regeln für menschliches Handeln*, pp. 9–39; and W. S. Jevons, *op. cit.*, pp. 37–74.)

[2] *Op. cit.*, p. 94.

[3] *Loc. cit.*, pp. 23–36.

[4] It was also adopted independently by two mathematical economists of Vienna, Rudolf Auspitz and Richard Lieben. *Revue D'Économie Politique*, IV (1890), p. 602.

convenience on the grounds that 'his (the individual consumer's) expenditure on any one thing . . . is only a small part of his whole expenditure'. Marshall admits that there are some exceptions. He refers, for instance, to the findings of Sir R. Giffen but 'such cases', he maintains, 'are rare' and 'when they are met with, each must be treated on its own merits'.[1] (Referring to Note VI in the Mathematical Appendix of his '*Principles*' where he indicates that formal account could be taken of changes in the marginal utility of money, 'if it were desired to do so', he emphatically repeats his earlier assertion: 'In mathematical language the neglected elements would generally belong to the second order of small quantities.'[2]) This assumption enabled Marshall to close the gap between the marginal utility curve and the demand curve; without it the marginal utility curve would have been below the demand curve for a fall in price and above the demand curve for a rise in price.

IV

The next logical step is the derivation of the individual consumer's demand.

Accepting that the consumer maximizes utility, the condition of the consumer's equilibrium is dictated by the proportionality rule: The consumer will come to equilibrium at a point where the 'marginal utility'[3] (the change in utility u with an infinitesimal change in amount possessed Q, i.e. du/dQ) of each commodity is proportional to its price. ($\frac{MU_A}{P_A}=\frac{MU_B}{P_B}=\frac{MU_C}{P_C}$ . . ., where MU is the marginal utility of the commodity and p its price.) An alternative formulation

[1] *Op. cit.*, p. 132.

[2] *Op. cit.*, pp. 132 and 842.

[3] The term 'marginal utility' which has become a standard expression in economics is Professor William Smart's translation of Friedrich Von Wieser's term '*Grenznutzen*' which was first used in the latter's *Über den Ursprung und die Hauptgesetze des wirtschaftlichen Werthes* (*On the Origin and Laws of Value*), 1884, at page 128. Gossen used 'utility of the last item'. Jevons introduced 'final utility' and 'final degree of utility'. The final degree of utility is the ratio of the increase in the total utility to the increase in the total quantity of the commodity made by the final unit. If we define the marginal utility as the addition made to the total utility adding one small unit to the existing stock then the final degree of utility is that quotient which is obtained by dividing the marginal utility by the size of the added unit. Intellectually, the concept of the final degree of utility is more satisfying than that of the marginal utility. It steers clear of any reference to the unit in which the quantity of the commodity is measured. It is mathematical, more precise, and better adapted to the application of utility analysis to the problems of economic theory. Léon Walras retained the term '*rareté*' introduced by his father Auguste Walras. Wicksteed proposed 'fractional utility'. J. B. Clark spoke of 'specific utility' and Pareto of '*ophélimité élémentaire*'.

will be that 'the marginal unit of expenditure in each direction brings in the same increment of utility'.[1] Such a position will also reflect an equilibrium between the consumer's marginal utility for each commodity and his marginal utility for money.

Considering the hypothetical table on page 21, our ideal consumer will be in equilibrium when he buys 6 lbs. of apples, 8 lbs. of bananas and 6 lbs. of cherries. At this point, his money expenditure on these commodities will be £1 6s, his total utility 216 utils and his gain from exchange (consumer's surplus) 86 utils. That no other allocation of this amount of money expenditure will yield 216 utils of utility can be proved by a *reductio ad absurdum.*

It may be mentioned here that in some formulations of the theory, prices and utilities are treated as 'ratio relations' and not as absolute quantities. Thus what is necessary to the theory of exchange is not that to *A* good *X* has a higher and good *Y* a lower marginal utility than to *B*, or vice versa, but that to *A* the comparative ratio between the marginal utilities of goods *X* and *Y* is different from the comparative ratio to *B*.

By varying the price of each commodity we can obtain a list of the quantities of each commodity that the consumer will demand at various prices (that is, the quantities he must purchase to be in equilibrium). Marshall called these quantities 'demand points'[2] and their corresponding prices 'demand prices'.[3] In view of the operation of the law of diminishing utility it is clear that the consumer's point of equilibrium for each commodity will move upwards with a rise in price and downwards with a fall in price. In other words, the individual's demand curve is 'inclined negatively throughout the whole of its length' (which is the same thing as saying that the quantity of any commodity which the consumer will buy is a decreasing function of its price). In fact, once the shape of the utility curve is known, the demand function gets precisely specified.

V

The transition to the aggregate (market) demand curve is a matter only of horizontal summation of the demands of all the individuals. It has the same properties as the demand curve of a single individual. Dupuit who was the first among economists to derive a demand curve from the law of utility gave two reasons to show that the market demand curve will be negatively inclined. First, with every fall in price the consumption of the article spreads to more and more

[1] J. R. Hicks, *Value and Capital* (1939), 2nd ed., 1946, p. 11.
[2] *Op. cit.*, p. 97.
[3] *Op. cit.*, p. 95.

consumers. Secondly, as the price falls, the existing buyers extend it to more and more uses. (This further implies that, where necessary, greater quantities will be allocated to the previous uses with every decline in the price.[1]) A formal definition of the demand curve for a market has been given by Marshall thus:

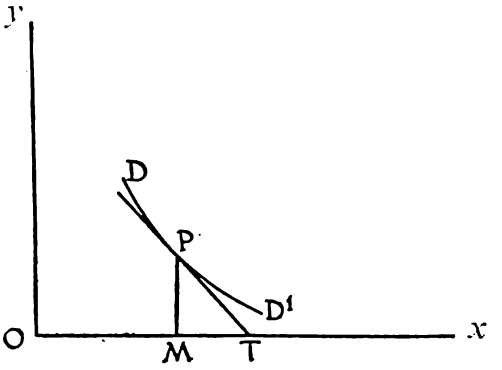

Fig. 1

> 'The demand curve for any commodity in a market during any given unit of time is the locus of demand points for it . . . if a point moves along the curve away from Oy it will constantly approach Ox. Therefore if a straight line PT be drawn touching the curve at P and meeting Ox in T, the angle PTx is an obtuse angle . . . a short way of expressing this fact . . . (is) by saying that PT is *inclined negatively*.[2, 3]'

Quoting the law of averages (like Dupuit, Jevons and Walras), Marshall observes: 'In large markets, then—where rich and poor, old and young, men and women, persons of all varieties of tastes, temperaments and occupations are mingled together—the peculiarities in wants of individuals will compensate one another in a comparatively regular gradation of total demand.'[4] Marshall notes certain exceptions to the law of demand. Thus he writes: 'There are

[1] Jules Dupuit, 'On the Measurement of the Utility of Public Works' (1844), translated from French into English by R. H. Barback, *I.E.P.*, No. 2, p. 103.

[2] *Op. cit.*, 83-84n.

[3] Augustin Cournot is the first among economists to develop a clear expression of the schedule concept of demand. Mathematically his law is $D=F(p)$ where the demand D is, for each article, a particular function $F(p)$ of the price p of such article. (*Researches into the Mathematical Principles of the Theory of Wealth*, 1st French edition 1838; English translation by N. T. Bacon, 1897; Ch. IV, para. 21.)

[4] *Op. cit.*, p. 98.

many classes of things the need for which on the part of any individual is inconstant, fitful and irregular. There can be no list of individual demand prices for wedding-cakes, or the services of an expert surgeon.' Again, he writes: 'It will of course be understood that "the law of demand" does not apply to the demand in a campaign between groups of speculators. A group, which desires to unload a great quantity of a thing on to the market, often begins by buying some of it openly.' But then he adds: '. . . the economist has little concern with particular incidents . . . He studies rather the course of action that may be expected under certain conditions from the members of an industrial group . . .'[1]

A popular modern textbook concluding discussion on the application of demand theory refers to these exceptions as 'three rather unimportant exceptions to the universal law of downward-sloping demand'.[2] It is a convention now to group cases where the demand curves are positive in their inclination under four headings: (1) 'Speculation'; (2) 'Giffen paradox', introduced by Marshall in the third edition of his *Principles* (1895); (3) 'Conspicuous consumption', a phrase popularized by Thorstein Veblen in *The Theory of the Leisure Class* (1899); and (4) 'Ignorance effect', where commodities may be mistaken for other commodities for many reasons; e.g. deceptive labels as well as price.

[1] *Op. cit.*, p. 98.

[2] P. A. Samuelson, *Economics* (1948), 3rd ed., 1955, p. 395.

Chapter 2

CRITICAL EVALUATION OF MARGINAL UTILITY ANALYSIS

We have discussed the utility theory of demand at some length. The formulation of the utility hypothesis was the first and the most fundamental stage in the development of the theory. Spanning well over a century and a half this process of development culminated in Marshall's *Principles* (1890). Marshall revised his *Principles* at intervals for thirty years, the last (8th) edition appearing in 1920.

Frank Knight wrote in 1931, 'Demand is one of the most elementary concepts in economics and one of the most seriously ambiguous. Properly understood it includes the entire complex of conditions, except price, which determines the amount of a commodity saleable in a given market at any named price.'[1] The work of Marshall's successors has been largely that of clearing up ambiguities in the formulation of the theory. In the process many new techniques have been found which, apart from being technically superior to the old ones, have enabled the theory to cover more complicated problems than those with which Marshall and his contemporaries attempted to deal. As most theoretical work on the subject issues from the weak points of the utility theory, it will be appropriate at this stage to focus attention on the main points of criticism of this theory.[2]

[1] F. H. Knight, *Encyclopaedia of the Social Sciences* (edited by E. R. A. Seligman), vol. 5, 1931, p. 69.

[2] There are several points of criticism of the exposition of the theory which can be directed only against some economists. Two examples may be given:

(*a*) Dupuit, who is the first economist to use the notion of a derived demand curve—he called it the 'curve of consumption'—Jevons and Menger (and his Austrian followers, notably Böhm-Bawerk) failed to distinguish between utility schedules and demand schedules. This error is not to be found in the theory as it was expounded by Walras, Wicksteed and Marshall. The confusion on the part of the former group was due to the fact that they expressed utility schedules in monetary terms and identified them with price-offers.

(*b*) Again, some utility theorists (e.g. Gossen, Jevons, Edgeworth and to some extent Walras) built their analysis on 'rationalistic hedonism' which, apart from being irrelevant to the foundations of the theory, laid the theory open to un-

II

In the first place, the utility theorists in their attempt to explain market demand which is an objective phenomenon got involved in difficult psychological and philosophical questions: to explain the character of demand they went to the origin of demand and argued how demand was 'a phenomenon of motivation'. The end to which they developed their analysis was the explanation of the price-determination mechanism. For this they developed a causal sequence between utility and price which (according to the classification developed by Jacob Viner) is as follows: 'from (1) a potential or future schedule of diminishing utility of successive units of a good to (2) a more or less accurate and conscious anticipation of this utility schedule, to (3) a corresponding desire schedule, to (4) a comparison, unit by unit, with the desire for what must be given in exchange for this good if it is to be obtained, which gives (5) an individual demand schedule in terms of the price-good, which compounded with the demand schedules of other persons gives (6) the market demand schedule, which is a determinant of (7) price.'[1]

The critics raised several objections to this type of reasoning. They alleged that the theory rested upon 'individualistic', 'hedonistic' (or 'utilitarian') and 'rationalistic' premises which was 'unsound psychology'. The law of utility which was the heart of the theory postulated that 'utility'[2]—understood as a 'pleasure' or a 'satisfaction'—decreased with increased consumption. This view of human nature is regarded as too naïve. As one critic laments, utility theorists did not show awareness of 'the many other "men" who walk about and variously perform "in the same skin" as the creature

deserved criticism. Jevons in particular elaborated the 'Theory of Pleasure and Pain' as worked out by Bentham and made it the basis of his theory of utility. Wicksteed and Marshall attempted to sever this link. Marshall was emphatic that 'Utility' which 'is taken to be correlative to Desire or Want' has 'no ethical or prudential connotations'. (*Principles*, p. 92.) He rebuked Jevons for confusing 'economics' with 'hedonics'. (*Ibid.*, pp. 17n and 90n.) Though some economists (e.g. Stigler) have taken the view that Menger's theory was also hedonic yet this connection in Menger's theory was very spurious. In fact, Menger (following the practice of natural scientists) took the concept of 'quantitative logic of causality' from mechanics and introduced it into economic theory.

[1] 'The Utility Concept in Value Theory and Its Critics, I', *J.P.E.*, August 1925, p. 373.

[2] As the term 'utility' is pregnant with utilitarian suggestions, several attempts were made to replace it with other expressions, themselves none too satisfactory. Thus Gide proposed 'desirability' and Wicksteed 'desiredness'. Fisher used 'desiredness' and 'wantability' and Pareto 'ophelimity'. Several other expressions have been used in the literature; e.g. 'pleasure', 'satisfaction', gratification', 'benefit', 'capacity to satisfy desire', etc., etc.

who merely uses means to satisfy "needs" (the automatic-mechanism, the conventional man, the playful, humorous, contentious, prejudiced, capricious, perverse, obdurate, destructive, benevolent man, the idealist, the esthete, the malicious man, etc., etc.).'[1] Again, the leap from utility to exchange implies that 'the intensity of desire for objects is governed by and is quantitatively a more or less accurate reflection of the utility or satisfaction-yielding power of the objects.'[2] The critics point out that 'men commonly seek, not utilities nor pleasures, but objects, and that they do not commonly engage in deliberative and careful comparisons and calculations of the units of pleasure which successive units of the same good, or units of different goods, or units at different stages of removal from the present, will yield to them. They ridicule the notion that man's desires are held in leash and spring into action only after completion of fine actuarial comparisons of the hedonic potentialities of different commodities.'[3]

As has been noted earlier,[4] these objections are quite puerile. The connection of the theory to hedonism (or utilitarianism) is quite illogical and was an unfortunate historical alliance. Since the theory did not have to investigate the nature of the human wants or desires, it could be and was at a later date actually stated independently of any hedonist assumptions. In England the renunciation was effected by Marshall and Wicksteed and, as Schumpeter observes, even the Austrians (faced by strongly anti-utilitarian German economists) 'pretty quickly realized the necessity of clearing their skirts of hedonism'.[5] A decade after the appearance of Marshall's *Principles* the objection was abrogated from all serious discussions of the theory and gradually the theory came to be treated more as a logic than a psychology of values.[6]

Some critics of the theory assumed that the law of diminishing utility, which explains why the market demand curve always slopes downwards and to the right, was derived from the Weber-Fechner

[1] F. H. Knight, 'Introduction' to the English translation of Carl Menger's *Principles of Economics* (1871) (translated from German by J. Dingwall and B. F. Hoselitz, 1950), p. 16.

[2] J. Viner, *op. cit.*, p. 373.

[3] *Ibid.*, p. 373.

[4] Cf. above, p. 16n, 2(*b*).

[5] J. A. Schumpeter, *History of Economic Analysis* (1954), p. 1056.

[6] Professor Hicks is of the opinion that Walras's theory is, in essence, more non-utilitarian than Marshall's. The present writer is unable to accept this view as Walras frequently refers to the individual's motives and expectations when he talks about the bases of his theory. But then Professor Hicks argues that all this in Walras's theory is a mere 'excrescence' and can be easily disregarded. (Léon Walras, *Econometrica*, October 1934, pp. 347–8.)

law of psychology.[1] Since the Weber-Fechner law applied only to the 'sensations' and not to the 'feelings', the theory derived from this law was invalid. As is well known to economists, none of the architects of the utility theory had any knowledge of this law—the earliest reference to it in economic literature is perhaps in F. Y. Edgeworth's *Mathematical Psychics* (1881).[2] As one economist observed, 'The law of diminishing utility, whether sound or not, has been developed by the economists as a product of their own observation and has not been borrowed from psychology.'[3] Strictly speaking, the evidence of the law of diminishing utility is 'introspective' but then the economists use this law only as a 'working hypothesis' to explain the negative slope of the demand curve which conforms to their observation of human behaviour in the economic markets.

III

Following criticism of the psychological presuppositions of the theory, objections have been raised, in the second place, to the characteristics of utility postulated in the theory. The two main aspects which have come in for constant criticism are: (1) the measurability of utility and (2) the nature of the utility function.

Almost all the utility theorists assumed that utility was a psychic fact, a psychological feeling which was known to individuals from experience and which could be measured on an interval scale; that is,

[1] E. H. Weber proposed the hypothesis: the just noticeable increment to any stimulus is proportional to the stimulus ($R-Reiz$), or $\frac{dR}{R}=k$.

G. T. Fechner made this constant of just noticeable differences the unit of sensation (S), to obtain $dS=C\frac{dR}{R}$, or, integrating, $S=C \log R/R_o$, where R_o is the threshold of sensation. (See G. J. Stigler, 'The Development of Utility Theory, II', *J.P.E.*, October 1950, p. 375.)

[2] Professor Schumpeter reports in his *History of Economic Analysis* (p. 1058) that the Weber-Fechner law was noticed by some economists (especially the Austrians) but it was brushed aside by them as having no connection with the law of utility. Professor Schumpeter's formulation of the law is as follows: if y be the intensity of sensation, x the physically measurable external stimulus, and k an individual constant, then $dy=k\ dx/x$.

[3] J. Viner, *op. cit.*, p. 376. Professor Viner has further proposed that the price-economists who wish 'merely to make a first contact between objective price and human psychology' should substitute the law of diminishing desire for the law of diminishing utility. 'Diminishing desire need be referred to only to explain diminishing price-offers as quantity available increases. The variations between the demand schedules for a given commodity of different persons can be explained as due either to differences in the intensity of their respective desires or to differences in the intensity of their aversions to surrendering the price-commodity or to both.' (*Ibid.*, pp. 376–7.)

with every utility feeling a real number could be associated (the concept of Cardinal Utility). Menger and Böhm-Bawerk believed that utility could be measured directly, though the latter spoke of utility measurements as rough estimates. Jevons and Walras suggested that the comparative amounts of feelings could be estimated from the quantitative effects they produce. Anticipating that his attempt to measure utility will be questioned, Jevons (like Lloyd) referred back to the vaguest notions that at one time prevailed about everything which was later rendered capable of exact measurement; measurement of heat for instance. 'The existence of heat was no less undeniable before thermometers were invented than at present' (W. F. Lloyd).[1] Marshall's attempt to measure utility indirectly through its external, observable effect is best illustrated by his concept of Consumers' Rent.[2] He takes Utility to be correlative to Desire (or Want) and then observes: '. . . desires cannot be measured directly, but only indirectly by the outward phenomena to which they give rise: and that in those cases with which economics is chiefly concerned the measure is found in the price which a person is willing to pay for the fulfilment or satisfaction of his desire.'[3] As has been noted earlier,[4] Marshall's method of measurement of utility depends on the assumption of constant marginal utility of money.

The hypothesis that utility could be conceived as quantitatively measurable, that is, as a number, was suspected by mathematical economists at a very early date. Irving Fisher who accepted it in the first part of his book, *Mathematical Investigations in the Theory of Value and Prices* (1892), and later tried to make it operational was forced to give it up in the second part of his book while he introduced discussion of complementary and substitute relations between commodities. Eight years later Pareto, who subsequently gave direction to the new line of thought, started giving vent to his scepticism that utility was a measurable quantity.[5]

During recent years the proposition has been debated to such a pitch that most discussions have become unproductive. The two economists who have done most of the cogitation and have led the

[1] A Lecture on the Notion of Value as distinguishable not only from Utility, but also from Value in Exchange, delivered in Oxford in 1833, reprinted in *Economic History*, May 1927, p. 180.

[2] The term 'Consumer's Surplus' dates from the Fourth Edition of Marshall's *Principles* which appeared in 1898.

[3] *Principles*, p. 92.

[4] Ch. 1, Section III, pp. 10–15 above.

[5] The first symptoms of Pareto's scepticism are discernible in the two articles that appeared in *Giornale degli Economisti* in the year 1900. See 'Excerpta del Trattato di Economia pura' and 'Sunto di Alcuni Capitoli di un Nuovo Trattato di Economia pura del Prof. Pareto' in the March and June issues.

debate are Oscar Lange and Paul Samuelson.[1] Pareto, while rejecting the idea of numerical utility, had observed that of the three states, A, B and C which a person considered, he could nevertheless tell whether the difference between the utilities of A and B was greater than, equal to, or less than the difference between the utilities of B and C. Lange pointed out that if such a comparison were admitted, it would easily lead to the numerical measurement of utility. Among economists who conducted empirical tests to measure marginal utility from the observed market data and household budgetary figures the two boldest attempts were those by Irving Fisher and Ragnar Frisch.[2] The methods devised by these economists, however, were based on rather unrealistic assumptions (1) that the consumer tastes are similar and (2) that the marginal utilities of the various commodities are independent of one another. As a result, the demand function is placed under such severe restrictions that its practical service is nil. An alternative mathematical exercise which has no operational significance has been performed by Samuelson.[3] Samuelson's method is based on the assumption that, 'During any specified period of time, the individual behaves so as to maximize the sum of all future utilities, they being reduced to comparable magnitudes by suitable time-discounting' and that 'The individual discounts future utilities in some simple regular fashion which is known to us.'[4] A moment's reflection reveals that Samuelson's time-discount functions are as unrealistic as the assumptions underlying Fisher's and Frisch's models.

An interesting line of thought was joined by John von Neumann and Oskar Morgenstern in 1944.[5] They demonstrated that if a person was confronted not with riskless but with risky choices—e.g. A certain, 50–50 prospect of getting B, 30–70 prospect of getting C, etc. —and if he maximized not actual but expected utility, a way back to measurability was open. The authors worked on the assumption that the individual can completely order probability combinations of states. Referring to the indifference-preference hypothesis which we are approaching, they observed: 'if the preferences of the individual

[1] O. Lange, 'The Determinateness of the Utility Function', *R.E.S.*, June 1934, pp. 218–25; P. A. Samuelson, (1) 'A Note on Measurement of Utility', *ibid.*, February 1937, pp. 155–61, and (2) 'The Numerical Representation of Ordered Classifications and the Concept of Utility', *ibid.*, October 1938, pp. 65–70.

[2] I. Fisher, *A statistical method of measuring 'marginal utility' and testing the justice of a progressive income tax* (1927); R. Frisch, *New Methods of Measuring Marginal Utility* (1932).

[3] See his 'Note on Measurement of Utility', *R.E.S.*, February 1937.

[4] *Ibid.*, p. 156.

[5] *Theory of Games and Economic Behavior*, First edition, 1944; Second edition, 1947.

are not at all comparable, then the indifference curves do not exist. If the individual's preferences are all comparable, then we can even obtain a (uniquely defined) numerical utility which renders the indifference curves superfluous.'[1]

While the measurability controversy is still unresolved, some economists accepting and others denying its admissibility, new methodological devices have been found which purport to steer clear of the assumption of numerical utilities.

IV

Another point that came in for criticism and started the process of metamorphosis in the theory at about the same time as the theory was developed was the assumption that the utilities of different commodities were independent; that is, the utility of every commodity is a function of the quantity of that commodity alone. Jevons, Menger, Walras and Marshall believed alike that the utility functions were additive; in other words, the utilities of different commodities could be combined by simple arithmetic addition. If x_1, x_2 . . . are the commodities, the total utility function can be written as

$$U=V_1(x_1)+V_2(x_2)+ \ldots V_n(x_n).$$

Marshall adopted this assumption in spite of the fact that elsewhere he called attention to rival commodities (like beef and mutton, tea and coffee, beet- and cane-sugar, etc.) and complementary commodities (like hops and malt, flour mill and oven, etc.). The latter class of commodities he brought under his notion of joint-demand and about the former he observed that 'This difficulty can be theoretically evaded by grouping the two "rival" commodities together under a common demand schedule.'[2] Edgeworth who fully accepted the view that utility was cardinally measurable was not prepared to accept the view that utilities of separate commodities could be combined in an additive total utility function. In his *Mathematical Psychics* (1881) he adopted the generalized utility function in which he made the utility to the individual a function of all the commodities that enter the individual's budget. He proposed that the utility function should be written as

$$U=\varphi(x_1, \ldots x_n),$$

where φ is any joint function of all commodities. After an interval of twenty years Pareto seized on this idea and started the gradual transformation of the utility theory which completed a stage in the development of the Hicks-Allen theory in 1934.

[1] *Ibid.*, pp. 19–20.

[2] *Principles*, pp. 105, 131–2n and 381–93.

V

Lastly, the critics of the utility hypothesis point out that whereas it assumes 'too much', it explains 'too little'. There is some force in this argument. As we shall presently see, the Hicks-Allen theory achieves the same results as the marginal utility theory on the basis of fewer assumptions; though from a practical standpoint the former takes us no farther than does the latter.

Reference has already been made to the fact that the utility theory as perfected by Marshall does not take account of complementary and substitutive relations between commodities.

Professor Hicks has further argued that Marshall's assumption of constant marginal utility of money taken with independent utilities reduces the validity of his demand theorem to the one-commodity case only. The argument takes the following course.

Start off with the position where the consumer is in equilibrium and vary the price of one commodity X. Supposing that the purchases of all commodities remain unchanged, the marginal utility of X would after the price change be smaller if the price has risen or greater if the price has fallen than the product of its price and the marginal utility of money. To re-establish equilibrium the demand for X must change to a level that equalizes the new marginal utility of X and the new price multiplied by the old marginal utility of money. In the new situation, the money expenditure on X is likely to vary depending on whether the marginal utility curve of X is elastic or inelastic (except in the rare circumstance where this curve has unit elasticity). To restore the consumer's total expenditure to the amount he has available for spending, his expenditure on commodities other than X must be varied; in other words, the demand for commodities other than X will tend to change. In view of Marshall's *ceteris paribus* this cannot happen, so that the adjustment must take place in the unit of utility measurement (that is, the marginal utility of money). There is a gallant inconsistency between Marshall's assumption of constant marginal utility of money and his *ceteris paribus* clause: they do not belong together.

Chapter 3

INDIFFERENCE-PREFERENCE ANALYSIS

The exposition of the weak points of the utility theory in the previous chapter does not claim to exhaust criticism of the theory but we hope to have conveyed the essential points. And as one author has observed, 'On some points the critics could be set off against one another, some crediting to the utility economics, as its only contributions, what others attack as its chief errors.'[1] In this chapter we shall be concerned with an alternative formulation, namely, the 'indifference-curve analysis method', which purports to give all the characteristics of the demand theorem that are derivable from the cardinal utility hypothesis. At the same time the proponents of the new method assert that their analysis is based on fewer and more tenable assumptions. Before any judgment is passed on the merits of the new theory, the main points of criticism of the utility theory may be summed up. In the first place, it was argued by critics that the psychological presuppositions of the theory were either untrue or absent from human behaviour. In this connection, the aspects which came in for special criticism were: (1) the postulate that the consumer was a rational entity who always maximized utility; (2) the law that the utility of a commodity increased at a diminishing rate as its stock (or consumption) increased; (3) the hypothesis that utility existed as a cardinal magnitude; and (4) the assumption that utilities of different commodites were independent of one another. In the second place, the critics pointed out that Marshall, who gave the utility theory its final architectural form, assumed too much under its *ceteris paribus* clause; and that for the theory to have realism and relevance, some of the variables ought to be let out of Marshall's 'pound'. We shall be returning to this point later.[2]

There is one point in the new theory to which attention may best be drawn at the outset. It is claimed by the leader of the new school

[1] J. Viner, *loc. cit.*, p. 180.

[2] See Chapter 7, Section IV.

that the demand theory based on the indifference-preference hypothesis is more suitable for the purposes of the econometrist and hence operationally more significant. When the theory was stated for the first time (1934) the econometric reference was not at all clear. It is in the nature of a postscript and has been advanced by Hicks in his *Revision of Demand Theory* (1956).[1]

II

The indifference-preference hypothesis, which was intended to supersede the marginal utility hypothesis, has retained some of the initial assumptions of the utility theory in order to yield the required demand theorem. Thus the assumptions of 'complete information' and 'rationality' have been retained. The former means that the consumer under consideration is completely informed about the relevant characteristics of the economic environment in which he operates (e.g., prices, markets, etc.). The latter implies that the consumer confronted with given prices and total money income performs all operations, which this knowledge enables him to do, so as to select that combination of goods which is highest on his preference scale. The assumption of 'continuity' was fully retained in the first version of the theory. Thus it was assumed that the consumer was capable of 'ordering' all conceivable sets of goods that were presented to him. This assumption has been relaxed in the revised version of the theory.[2] Now all that the consumer is expected to do is to 'order' only those combinations which might actually be under his consideration. In other words, while the older version of the theory was based on the 'completeness' of the system of individual preferences (the assumption of continuous indifference curves) the revised model can work with discontinuous functions (curves).

The cardinal element in the new theory is however the 'indifference-preference' hypothesis, known, for short, as the 'preference' or the 'indifference' hypothesis. This means that if the consumer is presented with a (finite) number of sets of various goods, he can arrange them in a 'scale of preference'. Thus if these alternatives are marked A, B, C, D, E, F . . . , the consumer can tell whether he prefers A to B, or B to A, or is indifferent between them. Similarly between any other pair of alternatives. This scale of preferences has two implicit assumptions. First, it includes the relation of 'preference' as well as that of 'indifference'; or what is called in symbolic logic, the assumption of 'weak ordering' as contrasted with the assumption of 'strong ordering'—the latter admits only the relation

[1] Chapter I, pp. 1–7.

[2] J. R. Hicks, *A Revision of Demand Theory* (1956), Ch. III (see especially p. 20).

of preference, i.e. A preferred to B or B preferred to A. Second, the relation between various alternatives are 'transitive' which means that if the consumer prefers A to B, B to C, then he also prefers A to C; similarly, if the consumer is indifferent between A and B, and B and C, then he is also indifferent between A and C.

The geometrical device to express the scale of preference is the 'indifference map' in which each 'indifference curve' represents all those combinations of goods which have the same 'total utility'.[1] Higher indifference curves (that is, curves falling to the right and above) are positions of relatively greater utility. It is a dominant characteristic of the indifference-curve system that the consumer is called upon to state only qualitatively the differences (distances) between various states; e.g., A preferred to B, B preferred to C. The consumer is not expected, as he is with the utility hypothesis, to be able to specify by how much he prefers A to B, B to C, and so on. In other words, as the indifference curves rise, the successive positions can be denoted by any ascending series, 1, 3, 7, 9 . . . ; or 1, 4, 6, 8, 13 . . . ; or 1, 2, 5, 8, 10 . . . The scale of preference replaces Marshall's utility schedules. In the familiar economic language it may be said that while the utility theory hypothesized a utility function measurable on an interval scale, the indifference-curve method hypothesizes a utility function measurable on an ordinal scale. (Since the ordinal utility function cannot be differentiated, it will not be permissible to speak of 'the marginal utility' in the new theory.)

III

The main points of the new theory are best summarized with the help of a diagram. In the following diagram X and Y are two com-

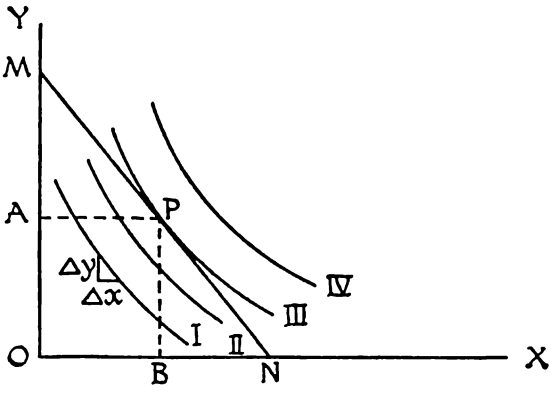

Fig. 2

[1] *Value and Capital*, p. 13.

modities and I, II, III, IV . . . are indifference curves showing a graphic picture of an ideal consumer's tastes (his 'scale of preference'). The theory ascribes the following properties to indifference curves: (1) they slope downward to the right; (2) they are convex toward the origin; and (3) they are non-intersecting.[1] The negative slope of the curves implies that as the quantity of X at the disposal of the consumer increases, that of Y must decrease. This characteristic is to secure the consumer indifference between points on the same curve. The convexity of the curves conveys the consumer's peculiarity that as his stock of X increases and that of Y decreases, he values X less in terms of Y. As a result of this, he wants more of X per unit of Y when the quantity of X increases; conversely, he wants to give less of X per unit of Y when the quantity of Y increases. The rate at which he is prepared to exchange X and Y is known as 'the marginal rate of substitution' which between any two points on the same indifference curve increases for one commodity and decreases for the other.[2] This rate is represented by the slope of the indifference curve. Thus in Figure 2 when the consumer sacrifices Δx of X and acquires Δy of Y, fully compensating himself for the loss of Δx by the gain of Δy, the marginal rate of substitution of Y for X (S_{yx}) may be expressed as the numerical value of $-\frac{\Delta y}{\Delta x}$.

Assuming that (*a*) the consumer's money income OM (in terms of Y) is fixed and (*b*) the prices of X and Y are given in the market; then, within these constraints, there are some definite quantities of X and Y that the consumer can buy. The line MN indicates all such possibilities. If the consumer spends all his income on X he can buy ON amount of X. Alternatively, he can buy any combination of X and Y falling on the line MN. This line is known as the 'price (or budget) line'.

If we join the consumer's price line and the indifference map together, we can read off the position of his equilibrium. The indifference map indicates the consumer's preferences, the price line

[1] While the indifference curves are derived from 'a kind of hypothetical experiment', their properties appear as the assumptions of the theory.

[2] In their 1934 article Hicks and Allen used the expression 'increasing marginal rate of substitution'. (See 'A Reconsideration of the Theory of Value', *Economica*, Part I, February 1934, pp. 52–76; Part II, May 1934, pp. 196–219.) In his *Value and Capital* (1939) Hicks replaced it by 'diminishing marginal rate of substitution'. (See p. 20.)

In his *Revision of Demand Theory* Hicks worked with the 'Logic of Order' which enabled him to drop the assumption of 'diminishing marginal rate of substitution' as well as the assumption of 'continuity'. The consumer is no longer required to 'order' *all* conceivable alternatives in any methodical way. (See Chapters III, IV and V.)

his power to fulfil them. The position of highest fulfilment ('maximum satisfaction') is identified as the position of consumer's equilibrium. This will be at the point P on the indifference curve III which is the highest attainable point in consumer's scale of preference, subject to budget and price constraints. At this point the slope of the price line, which expresses the price ratio between X and Y, is the same as the slope of the indifference curve III, which expresses the marginal rate of substitution between X and Y—the familiar proportionality rule. The consumer buys OB of X and OA of Y. If we suppose that X is any ordinary commodity of consumption and Y the 'composite commodity money' then we know how much of his income the consumer allocates to X. Assuming that he spends all his income, the latter (OA) will represent his allocation to commodities other than X.

IV

It will be helpful to consolidate the achievement of the new theory up to this stage, as hereafter it purports to break fresh ground.

In the first place, we find that while the older theory described consumer tastes in terms of cardinal utility, the new theory does so only in terms of ordinal utility. The quantitative utility schedules have been superseded by scales of preference. It is claimed that this assumption of the new theory closes the gap between theoretical abstraction and reality and brings the theory of demand, for the first time, within the purview of econometric operations.

In the second place, the law of diminishing marginal utility of the old theory has given way to the principle of diminishing marginal rate of substitution. The latter embodies only a quantitative relationship between commodities and frees the theory from many psychological objections. However, it will be appreciated that from the economic point of view, the essential element in this part of the theory is the characteristic of diminution of rates of exchange at the margin, if we are to have any equilibrium theory at all; and this is common to both the theories.

What is fundamentally new in the theory is, however, its attempt to generalize the law of demand. It is the view of the indifference-preference school of thought that Marshall's law is hedged about with so many qualifications that, from the point of view of practical 'applicability', its scope is greatly reduced.

To be specific, what Marshall did was this. He allowed the price of a single commodity to vary, holding the prices of all other commodities constant. Then he assumed that the marginal utility of income did not change while the consumer went on spending his

income on the commodity under consideration. This was equivalent to saying that the ratio between the marginal utility of this commodity and its price was constant.

From the above procedure two restrictions follow on the nature of the resulting demand theorem. First, that the consumer's demand for any commodity is independent of his income. Second, and this follows from the first, that where the 'income effect' is significant—as, for example, in the case of food and house room which generally take a large part of total consumer outlay—the law of demand does not apply.

Another hiatus in Marshall's theory is the treatment of 'related goods'. By assuming 'independent utilities' Marshall completely bypassed the issue of complements and substitutes. The Hicks-Allen theory takes up the issue of independent goods as a special case of a more generalized treatment of complementary and competitive goods.

V

The method by which the above qualifications of Marshall's theory are relaxed is the most ingenious part of the Hicks-Allen theory. In fact, it is at this stage that the merit of this theory becomes pronounced: a way is found to take account of the effects of changes in income (consumer's supply of money) on demand which was not possible in Marshall's theory and had to be assumed away.

If we consider, *de novo*, what factors bring about changes in the quantity demanded of a commodity, we shall find three possible explanations:

(1) the consumer's income has changed; or
(2) the price of the commodity has changed; or
(3) the price of some other commodity has changed.

The assumption that the consumer's tastes (represented by utility schedules or scales of preference) are stable is continued. Marshall's law of demand relates the quantity demanded of a commodity to its price (No. 2 above) in the form of function and variable. He ignored income and cross effects (No. 1 and No. 3 above). In the Hicks-Allen theory the influence on the quantity demanded becomes the composite of all the three variables enumerated above. The discussion of the method employed to deal with income and price changes (Nos. 1 and 2) can be simplified by considering in the first instance a change in the price of the given commodity (No. 2). We

further assume, as before, that there are only two commodities, X and Y, and that the consumer spends all his income on them. Now imagine that the price of one of these commodities changes. This change is likely to generate two types of effects: (1) an 'income effect' which will correspond to the change in the level of the real income of the consumer; and (2) a 'substitution effect' through which the consumer will tend to substitute some quantity of the commodity that has become relatively cheaper for the other that has become relatively dearer. While the substitution effect will always be positive, tending towards the relatively cheaper, against the relatively dearer, commodity, the importance of the income effect depends on two factors: (*a*) the character of the commodity under consideration; namely, whether it is 'normal' or 'inferior'; and (*b*) the proportion in which the consumer has been dividing his expenditure between this commodity and other commodities. If the consumer has been spending a good deal of his income on the commodity that has fallen in price, the income effect is likely to be very significant. A fall in the price of any commodity results in an increase in the real income; it enables the consumer to buy more of the commodity that has fallen in price and all other commodities. Conversely, with a rise in price. However, if the commodity that has fallen in price is such that the consumer consumed it only at lower levels of income, he may gradually turn away from its consumption; for every fall in its price will place the consumer in a higher (real) income bracket. As a consequence, we can establish the following theorems:

(1) For normal commodities, both the income and the substitution effects are positive; so that Marshall's law of demand—contraction of demand with a rise in price and extension of demand with a fall in price—will hold.

(2) For inferior commodities the outcome will depend on the relative strength of income and substitution effects. For these commodities the income effect is always negative and the substitution effect positive; the net effect will really determine the relationship between the quantity demanded and the price of the given commodity. If the substitution effect is so strong as to swamp the income effect, the inverse quantity demanded and price relationship of Marshall's law of demand will still hold. But if the income effect is relatively stronger so as to drown the substitution effect, the demand curve will have a positive slope, the quantity demanded increasing with a rise in price and decreasing with a fall in price. This will happen when the consumer is spending a large proportion of his income on the inferior commodity. A short way of expressing these characteristics will be to say that the inferior commodities of the

Giffen class have negative income elasticities of demand[1] which are large enough to outweigh the substitution effect.

To deal with cross price-effects, Hicks and Allen have set up what the former author called the 'theory of complementary and substitute goods'.[2] This theory falls into two main parts: the first part is an attempt to develop a definition of complementary and substitute goods which is independent of psychological assumptions; the second part is an attempt to make the new definition operational.

The classical theory of demand, concluded in Chapter 1, did not take cognizance of any relationship between commodities: it assumed that the commodities are 'independent' in consumption. Edgeworth and Pareto, who developed the notion of indifference curves to deal with the utilities of non-independent commodities, stated that the commodities could be defined as 'complementary', 'independent' or 'substitutive' in consumption, according as an increase in the quantity of one of them increased, maintained or decreased the marginal utility of the others. On this definition X and Y will be complementary if an increase in the quantity of Y, the quantity of X remaining unchanged, increased the marginal utility of X; X and Y will be substitutive if an increase in the quantity of Y, the quantity of X remaining unchanged, diminished the marginal utility of X. This definition is open to two serious objections: first, to be 'operational' it calls for 'introspective comparisons'; and, second, it is based on the assumption that utility is uniquely measurable. For the same reason for which they discarded the marginal utility hypothesis of the utility school, Hicks and Allen have rejected the definition of complementarity developed by Edgeworth and supported by Pareto. Their own definition runs in terms of ratios of marginal rates of substitution between commodities and is as follows: Y is a substitute for X if the marginal rate of substitution of Y for money is diminished when X is substituted for money; Y is complementary with X if the marginal rate of substitution of Y for money is increased when X is substituted for money—assuming that the level of consumer well-being (indifference) is unchanged. It should be remarked here that while the classical definition had the advantage of being capable of statement exclusively in terms of individuals' tastes, the Hicks-Allen definition can be established only with

[1] The income elasticity (E) indicates the ratio between relative changes in quantity and income, brought about by small variations in income, which is equal to the sum of the price elasticity (e) of the commodity and the cross elasticities ($e_1, e_2, e_3 \ldots e_n$) of all other commodities (saving included)—the last two partial elasticities being expressed with the opposite sign. [$E=-(e+e_1+e_2+e_3 \ldots e_n)$].

[2] *Value and Capital*, p. 50.

reference to the market situation. And contrary to the impression given by the authors, the Hicks-Allen definition of complementarity is no more operational than Edgeworth's, since the necessary relationships implied in their theory cannot be discovered. Another peculiarity of this definition is that, while we can talk about substitution in a two-commodity world, complementarity can be defined only if we introduce at least one more commodity. Hicks and Allen introduced money (commodity Z) which is a composite of all commodities. This procedure is valid so long as the relative prices of commodities lumped together in Z are constant. If we assume that the consumer's (real) income is constant and he is dividing his income between purchases of two commodities only, then these commodities can only be substitutes for one another. An increase in the quantity of one commodity requires a decrease in the quantity of the other, otherwise the level of consumer's well-being (his state of indifference) will change.[1]

The second part of the Hicks-Allen theory deals with the recognition of cross price-effects. Once the commodities are classified as complements and substitutes, any price change can be conceived as generating two types of effects, the 'income effect' and the 'substitution effect'. The remainder of the argument consists of splitting these effects, observing the familiar categorization of commodities as 'normal' and 'inferior' commodities, and applying the rules of income and substitution effects already described.

VI

The transition to the market demand curve raises only one point of any theoretical significance. The negative income effect in the case of inferior goods is likely to be weakened when we shift from a single person's consumption to that of the large groups of consumers. For what may be an inferior commodity for some may be a normal commodity for others. The degree to which the negative income effect will be neutralized in the large market depends on the dis-

[1] It may be observed in passing that the Hicks-Allen definition of complementarity reduces to the Edgeworth-Pareto definition of complementarity if we introduce the assumption of constancy of marginal utility of money.

Yet another definition of complementarity which has only a theoretical interest and does not apply to statistical demand functions is the one developed by Johnson and Allen. (See, 1, W. E. Johnson, 'The Pure Theory of Utility Curves', *E.J.*, December 1913, pp. 483–513; and 2, R. G. D. Allen, 'A Comparison between Different Definitions of Complementary and Competitive Goods', *Econometrica*, April 1934, pp. 168–75.) A variant of this definition developed by Milton Friedman in an unpublished paper is reported by Henry Schultz in his *Theory and Measurement of Demand* (1938), pp. 614–19.

tribution of income in the economy. The more varied the distribution and the wider the use of the commodity, the less will be the chance that the negative income effect will be important. The celebrated example of the positively sloping demand curve noticed by Giffen, although true of England a century before, may be statistically refutable when applied to present-day circumstances.[1]

It may be appropriate to remark here that although the proposition of negative income effect does not alter the core of Marshall's demand theory, it does afford an explanation for a disconcerting situation which Marshall rules out as an exception.

VII

Before concluding this chapter a passing reference may be made to an issue which does not strictly fall within the scope of this inquiry. As will be clear from the above discussion, the technique of indifference curves defines only a single person's preferences. Whether we can talk of a community's (or collective) indifference curves—which are being used regardless of whether we can give them any meaning or not, as, for example, in the theory of international trade[2]—remains as yet a theoretical impasse.

[1] For a short history of the 'Giffen Paradox' see G. J. Stigler's 'Notes' on the subject in the April 1947 issue of the *J.P.E.*, pp. 152–6.

[2] A. P. Lerner's paper, 'The Diagrammatical Representation of Cost Conditions in Internal Trade' (*Economica*, August 1932), and W. W. Leontief's paper, 'The Use of Indifference Curves in the Analysis of Foreign Trade' (*Q.J.E.*, May 1933), mark the beginning of this development.

Appendix to Chapter 3

DEVELOPMENT AND USE OF INDIFFERENCE CURVES

A large part of the literature on the subject of indifference curves deals with problems of hypothetical character which have no relevance to the problem in hand. The following note is an attempt to encompass in brief the main landmarks in the development of the indifference-curve technique and its application.

II

Among economists who have contributed towards the subject, there are some who were concerned with it only indirectly. Thus Edgeworth, who is regarded as the pioneer in the field, devised the technique of the indifference curve and employed it only in his theory of barter to show that the possibilities of exchange between the two parties were limited (*Mathematical Psychics*, 1881). Marshall reproduced the gist of Edgeworth's argument in his *Principles* (Mathematical Appendix, Note XII) but made no use of it. A little later Fisher discovered the same technique independently (*Mathematical Investigations in the Theory of Value and Prices*, 1892). However, there are two noteworthy differences between the formulations of Edgeworth and Fisher. First, Edgeworth derived the indifference curves from a utility surface. Fisher simply postulated that they existed and took them as the starting point of his analysis. Second, in Edgeworth's indifference curves, the co-ordinates of any point express two quantities, one of which is 'acquired' and the other is 'sacrificed'. Thus one quantity enters positively and the other negatively. He considered the 'net utility' of an exchange which increased 'with increase of acquisition or decrease of sacrifice'. His curves are, therefore, 'convex to the sacrifice axis and concave to the acquisition axis'. Fisher, instead of considering the 'net utility' of an exchange, considered the total utility resulting from the combination of the two quantities, both contributing positively. His 'total

utility' (indifference) curves are, therefore, convex to both the axes—the familiar modern form. Similar differences appear in relation to the positions of their respective price lines. While Edgeworth's price lines start from the origin, those of Fisher cut the two axes. Although in Part II of his book Fisher tried to construct a non-utility theory of consumer equilibrium, pointing out that if account was taken of complementarity relationships between commodities, the concept of measurable utility becomes nebulous yet both Edgeworth and Fisher declared themselves in favour of the doctrine of cardinally measurable utility. Pareto who followed Fisher without having noticed Fisher's work at first accepted the marginal utility analysis but later turned against it. (*Manuel d'économie politique*, Italian ed. 1906, French ed. 1909; also see above, pp. 28–9, footnote 18.) He developed an 'Index Function' (*'funzione-indice'*) which is based on ordinal utility. This function represents only the consumer's 'scale of preference'. Thus with Pareto, as with Edgeworth, the indifference curves are derived from index (or utility) functions. Pareto used them to demonstrate that all the theorems that were originally derivable from the marginal utility hypothesis could be derived from them, thus obviating the need to hypothesize cardinal utility. Though Pareto set out to transform the bases of Marshall's theory of demand, there remained serious inconsistencies in his work. Thus even after adopting ordinal utility he continued to talk about the marginal utility and its sign. Soon after Pareto's work appeared, W. E. Johnson contributed a paper in the *Economic Journal* which marks a substantial advance in the analytical apparatus of indifference curves and their application. ('The Pure Theory of Utility Curves', December 1913 issue, pp. 482–513.) Johnson's paper springs directly from Edgeworth and contains no reference to Fisher and Pareto. However, like Pareto, he proceeded to show that to define the position of consumer equilibrium there was no need to assume a determinate or measurable concept of utility. 'There are no lines in the figure which measure the utility itself. The several utility-curves are arranged in a scale of increasing value as we pass to the right and above; and thus the "distance" (measured arbitrarily) from one curve to another "indicates" (without measuring) the increase in utility. But this impossibility of measurement does not affect any economic problem. Neither does economics need to know the marginal (rate of) utility of a commodity. What is needed is a representation of the *ratio* of one marginal utility to another. In fact, this ratio is precisely represented by the *slope* at any point of the utility curve.' (*Loc. cit.*, p. 490.) Johnson called indifference curves 'constant utility curves'. (*Loc. cit., p.* 487.)

Pareto and Johnson substituted the indifference-preference hypo-

thesis in place of quantitative utility schedules as the centrepiece of the new theory. Their analysis lacked nothing but the working out of the implications of this change. This is what Professor Eugen Slutsky accomplished in 1915. ('On the Theory of the Budget of the Consumer', translated from Italian into English by Olga Ragusa, printed in *Readings in Price Theory*, edited by K. E. Boulding and G. J. Stigler, 1953, pp. 27–56.) Building only on Pareto's ideas Slutsky defined utility as 'a quantity possessing the property of assuming greater or less values according to the degree of preference for the combination expressed by the individual considered'. (R. G. D. Allen, 'Professor Slutsky's Theory of Consumer's Choice', *R.E.S.*, February 1936, pp. 120–1.) He wrote the utility function as $u=\psi\ (x_1, x_2, \ldots x_n)$ and then made three assumptions about its properties: (1) that the utility function and its derivatives of the first two orders are continuous; (2) that the utility function remains unaltered in form during the period of time considered; and (3) that the increment of utility from one combination of goods to another is not dependent on the mode of variation from the one combination to the other. He then developed a theory of consumer equilibrium which was, to quote him, 'completely independent of psychological assumptions and philosophical hypotheses.' (*Loc. cit.*, p. 27.)

Two decades later Hicks's and Allen's classic paper (see above, p. 38, footnote 2) carried the process of change to its logical conclusions; though by that time neither they nor the body of academic economists outside Italy had noticed Slutsky's paper (perhaps owing to the circumstances of war at the time Slutsky's paper appeared). Slutsky's paper was discovered independently by Schultz and by Hicks and Allen in 1934. The theory of Hicks and Allen cast off the last vestiges of introspective elements from the theory: the definition of complementary and competitive goods which until then ran in terms of utility (Edgeworth had provided it and Pareto retained it) was rendered in terms that were entirely independent of any notion of utility. Slutsky who had very largely anticipated Hicks and Allen did not work on this part of the new theory. Since its first complete statement in 1934 by Hicks and Allen, the theory has been restated by its authors and others several times. A comprehensive revision of it was attempted by Hicks in 1956. In his presentation of the theory of consumers' choice in his *Value and Capital* (1939) Professor Hicks credits Slutsky with what he calls the 'Fundamental Equation' of Value Theory. (See 'Mathematical Appendix' to the 2nd ed., 1946, p. 309.) While interpreting the Hicks-Allen and the Slutsky versions of the theory we should bear in mind that the treatment of the substitution effect in the two versions has an important difference. While the Hicks-Allen substitution effect results after the money income is

adjusted in such a way as to leave the real income constant, the Slutsky substitution effect results after the money income is adjusted in such a way as to leave the real income changed. The former implies a change in demand along a given indifference curve, the latter implies a change from one to another indifference curve. (See J. L. Mosak, 'On the Interpretation of the Fundamental Equation of Value Theory', in *Studies in Mathematical Economics and Econometrics*, edited by Oscar Lange and others, 1942, pp. 69–74.)

III

The theory as developed by Hicks and Allen can be amplified by geometrical analysis.

1. Assuming that there is a saturation point (S)[1] in the commodity plane (OXY) of the consumer, where the consumer has got the maximum quantities he needs of the commodities x and y, the shape of the indifference curves can be deduced from the assumptions made about the characteristics of these commodities. Figures 3, 4 and 5 represent the indifference curve systems for 'independent', 'complementary' and 'competitive' goods respectively. The lines AA^1 and BB^1 are 'partial saturation lines' which indicate the levels up to which the utility increases with increase respectively in the quantities of x and y. The area OASB represents the region within

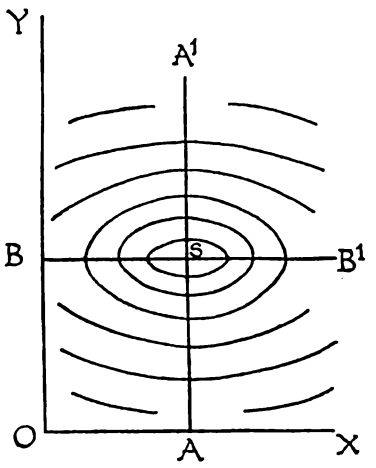

Fig. 3

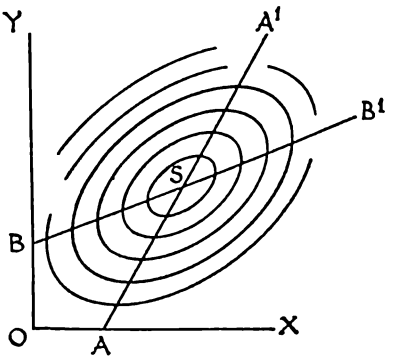

Fig. 4

[1] The implications of the saturation point and the area beyond it have been explored further by Professor J. M. Clark. (See his paper, 'Realism and Relevance in the Theory of Demand', *J.P.E.*, August 1946, pp. 347–53.)

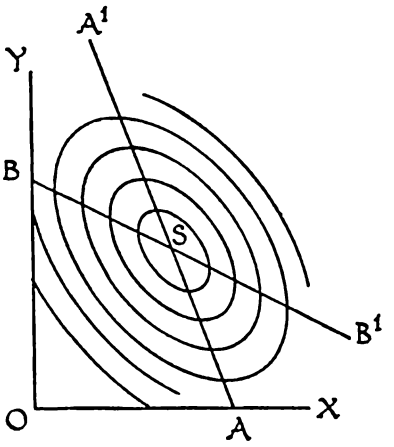

Fig. 5

which the marginal utilities of both the commodities (x and y) are positive. Outside this 'effective region', the marginal utility of at least one of these commodities is negative, in that the curves bend upwards (part AS) or to the right (part BS). AA^1 is the locus of points at which the indifference curves are horizontal, while BB^1 is the locus of points where they are vertical. As in real life, observation is possible only within a small range (around the actually known exchange ratios) the indifference map is usually restricted to segments of indifference curves falling within the 'effective region' (see Figure 6 below). The characteristic properties of indifference curves that they are negatively sloped and are always convex to the origin

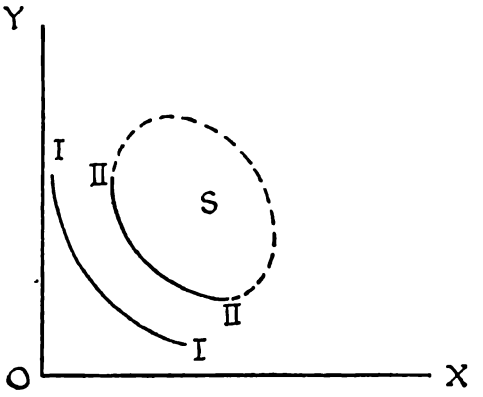

Fig. 6

are true only in the effective region. As the individual consumer crosses higher and higher indifference curves (whatever the region) his total utility continues to increase until he reaches the saturation point, where it is maximum.

The saturation point in the indifference curve system corresponds in the utility theory to the point where the marginal utility is neither positive nor negative (P in Figure 7 below).

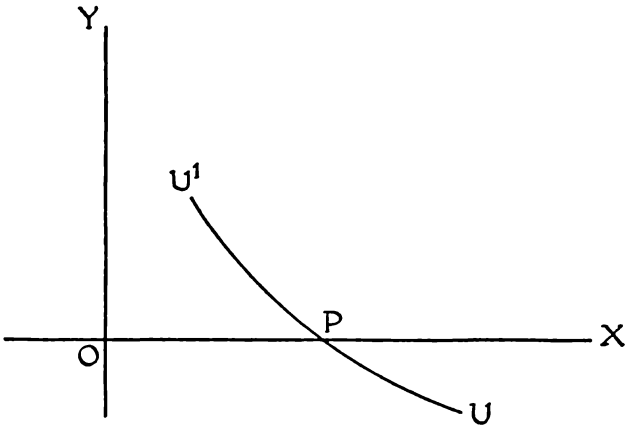

Fig. 7

At this point the marginal utility of X is zero and the total utility maximum. If the individual consumer crosses this point in the acquisition of X, the marginal utility becomes negative and the total utility diminishes with every increment of X. The positions to the right of P can be compared to the positions in the three regions adjoining the effective region in the indifference curve system.

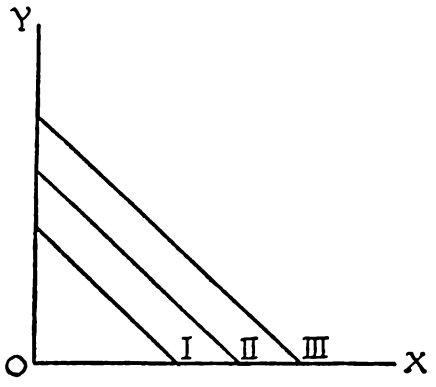

Fig. 8

2. The three cases illustrated above are typical of the general classes of commodities but they do not by any means exhaust all the possibilities. The curvature of indifference curves reflects the degree of complementarity and substitutability between commodities. The less curved the indifference curves, the greater the degree of substitution. For perfect substitutes the indifference curves become straight lines (Figure 8 opposite). In this marginal case, there is no theoretical meaning in distinguishing between the two commodities. If conversely, the commodities are complementary, the indifference curves become more curved. The greater the curvature, the higher the degree of complementarity. The marginal case of extreme complementarity when the two commodities can be used together in a fixed proportion is reflected in Figure 9.

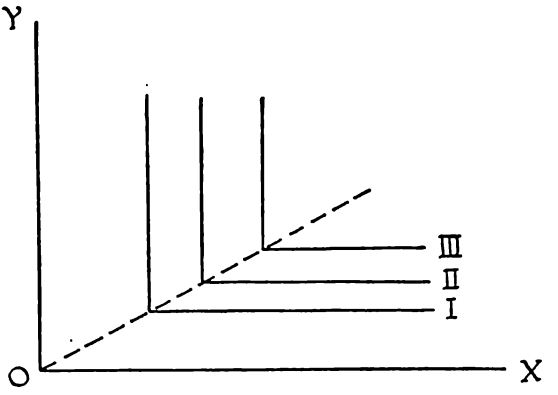

Fig. 9

3. Changes in consumption due to 'income' and 'price' variations are revealed by the two paths, ABC and AST (Figure 10), known respectively as the 'income-consumption curve' and the 'price-consumption curve'. The income-consumption curve joins points on successive indifference curves where all the curves have the same slope. It is the locus of points of contact between indifference curves and the constant-slope price line as the price line is pushed outwards, not because of a change in relative prices but because of a change in money income (which, at constant prices, is a change in real income). The price-consumption curve joins points where the price-line radiating from M touches the indifference curves as N moves outwards. Now the relative prices change (as shown by the change in the slope of MN) but money income is unchanged. The income-consumption curve ordinarily slopes upwards and to the right but in the case of inferior goods it may turn upwards to the left or downwards

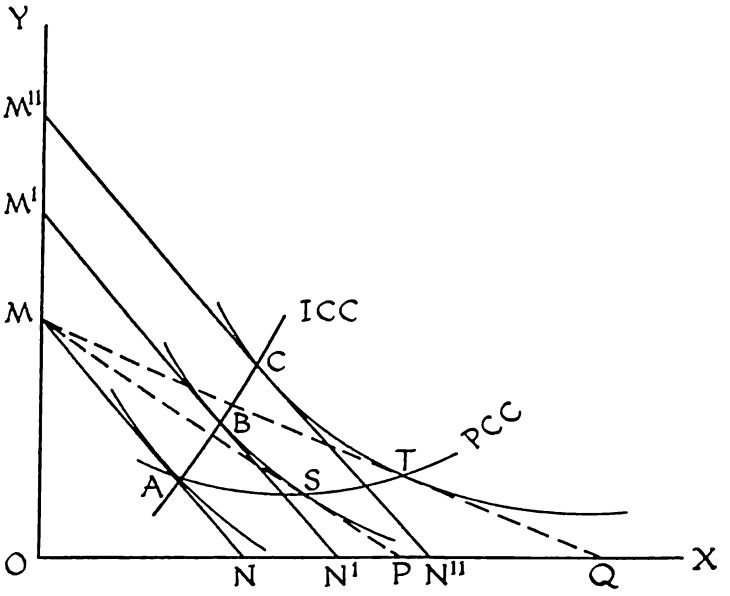

Fig. 10

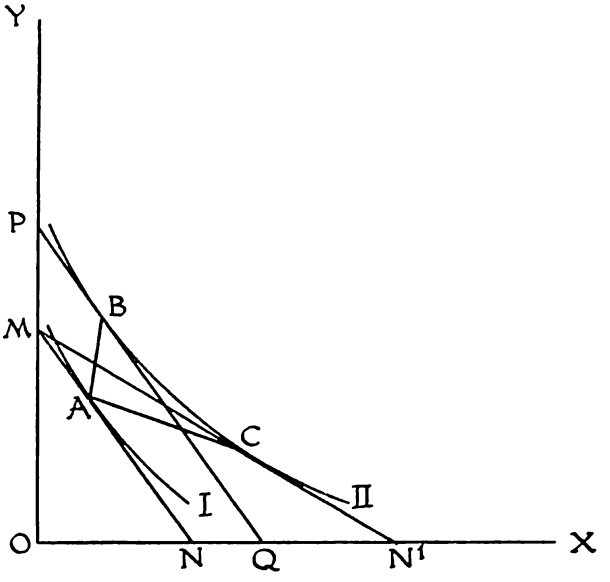

Fig. 11

to the right. One property can, however, be deduced from the convexity of indifference curves; that the price-consumption curve must lie to the right (left) of the income-consumption curve in the case of a price fall (rise).

4. The 'income effect' and the 'substitution effect' can be illustrated by considering a fall in the price of X. Starting off from the initial position A (Figure 11), a shift in consumption will take place, after the fall in price, from position A to position C. The path from A to C can be thought of as comprising two separate moves. Position B (where the indifference curve through C touches a straight line parallel to MN) indicates a shift in the consumption of X and Y due to a rise in the real income of the consumer (the 'income effect'). However B is not a position of equilibrium as X has become relatively cheaper and it is to the advantage of the consumer to replace some Y by X. This brings about the substitution effect which is revealed in the move from position B to position C.

5. Figures 12–15 compare the treatment of the 'substitution effect' in the two versions of the theory, namely, that of Slutsky and of Hicks and Allen. We start off with A as the initial position of consumer equilibrium. The effect of a fall in the price of X, the price of Y remaining constant, is shown as a composite of two effects—the 'income effect' and the 'substitution effect'.

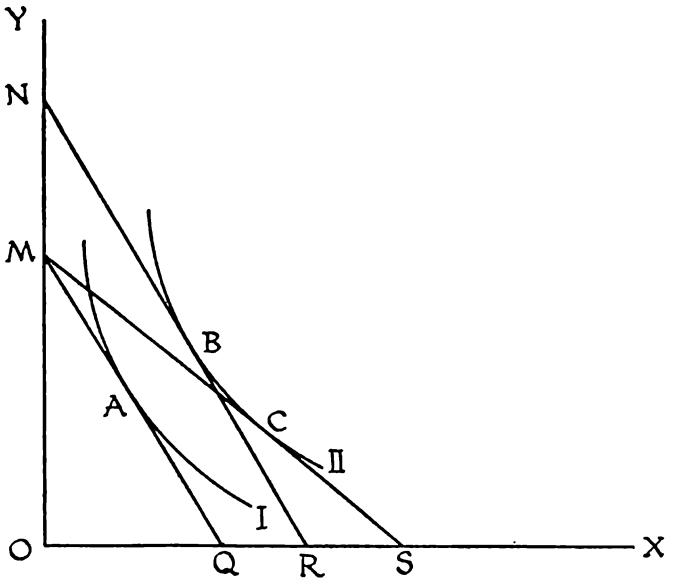

Fig. 12

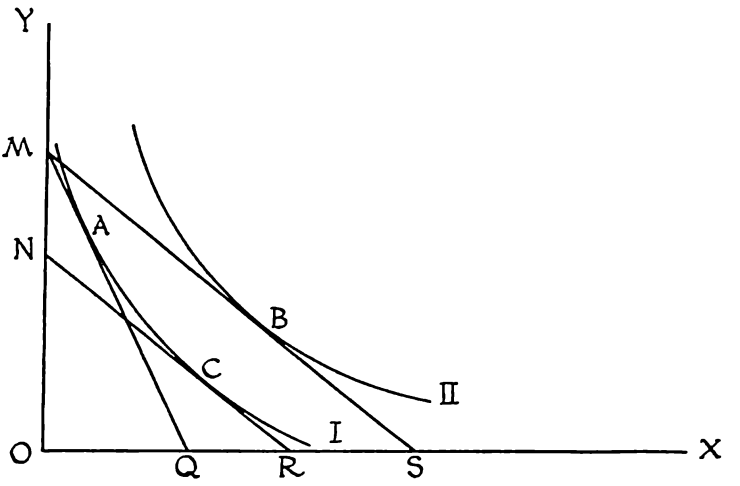

Fig. 13

Figures 12 and 13 show the substitution effect as in the Hicks-Allen theory. In Figure 12 we view the income effect first and the substitution effect second; in Figure 13 we view the substitution effect first and the income effect second.

In Figure 14 we have shown the Hicks-Allen substitution effect and the Slutsky substitution effect together. The Hicks-Allen substitution effect is shown along the indifference curve I (A to B). The Slutsky substitution effect is shown by a move on a higher indifference curve II (A to B^1).

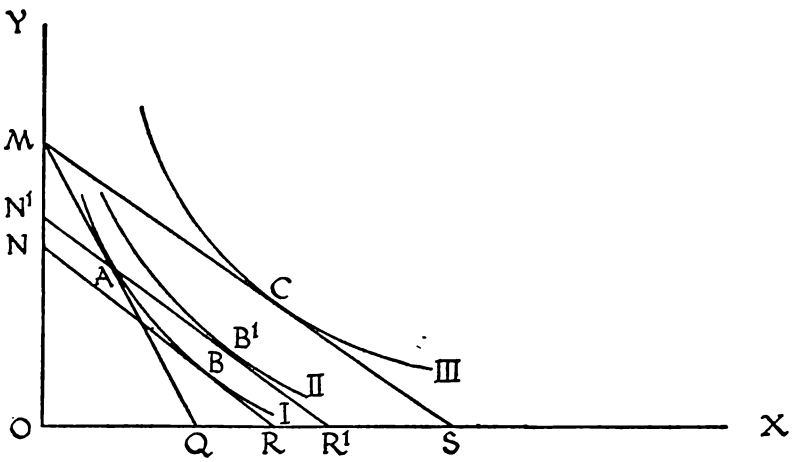

Fig. 14

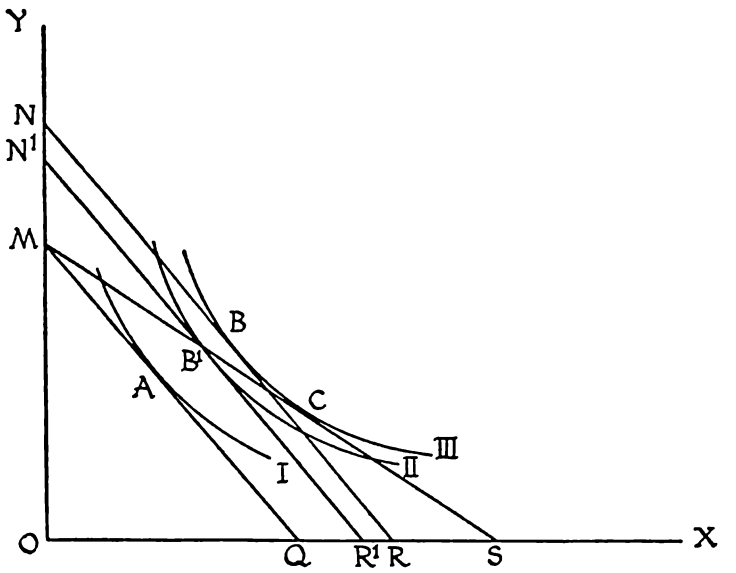

Fig. 15

In Figure 15 we have shown the income effect first and the substitution effect second. The Hicks-Allen substitution effect appears along the same indifference curve III while the Slutsky substitution effect is shown by a move from a lower indifference curve II to a higher indifference curve III (B^1 to C).

6. The theory of consumer's choice sketched out in Chapter 3 encounters two commodities, X and Y, as contrasted with only one in the classical theory. From the point of view of generalizing the theory of consumer's choice this was the crucial step; for, once the theory has been established for two variables, its extension to cover the several-commodity case offers only a technical difficulty. When we deal with more than three variables, the geometrical analysis breaks down; for, the number of physical spatial dimensions is limited. For three variables we can use three-dimensional diagrams but for more than three variables we must have recourse to algebra.

A simpler method of generalizing the theory of consumer's choice to more than two commodities is to plot the 'composite commodity' money (which represents expenditure on all commodities other than X) along the Y-axis. The success of this method has been convincingly portrayed by Professor Hicks in his *Value and Capital.*

Chapter 4

CRITICAL EVALUATION OF INDIFFERENCE ANALYSIS, THE THEORY OF REVEALED PREFERENCE AND NOTES ON SOME RECENT DEVELOPMENTS

In the previous chapter we were mainly concerned with introducing the method of indifference analysis as an alternative to cardinal utility analysis for the purpose of enunciating the demand theorem. As the study was designed to be comparative, we did not undertake a critical evaluation of the new theory. This will be attempted in the present chapter while the opportunity will also be taken to review briefly some recent developments in the field, notably the Theory of Revealed Preference.

II

A serious shortcoming in the indifference analysis lies in the meaning we attach to 'indifference'. In spite of the 'romantic glamour' associated with the development of the indifference-curve notation, the authors of the new theory did not unfold the concept of indifference. As a consequence of this failure, some criticism has been developed which if valid strikes at the very roots of the new theory.

One economist who has developed his criticism consistently and worked out its implications is Professor Armstrong.[1] In his view, in most cases in which the consumer indifference is noticed it is due to the consumer's imperfect ability to perceive difference between alternative combinations of goods. If this view of indifference is adopted, the relation of indifference becomes non-transitive. Further, as, in Armstrong's view, the underlying utility relation is quantitative, the relation of indifference can remain symmetrical only when utility difference is zero; otherwise, it becomes asymmetrical.

A simple diagrammatic exposition can bring out the main point

[1] W. E. Armstrong, 'The Determinateness of the Utility Function', *E.J.*, September 1939, pp. 453–67 (see especially pp. 457–9); 'A Note on the Theory of Consumer's Behaviour', *O.E.P.*, January 1950, pp. 119–22; and 'Utility and the Theory of Welfare', *O.E.P.*, October 1951, pp. 259–71 (see especially p. 263).

of Armstrong's thesis. Consider four points, A, B, C and D, lying

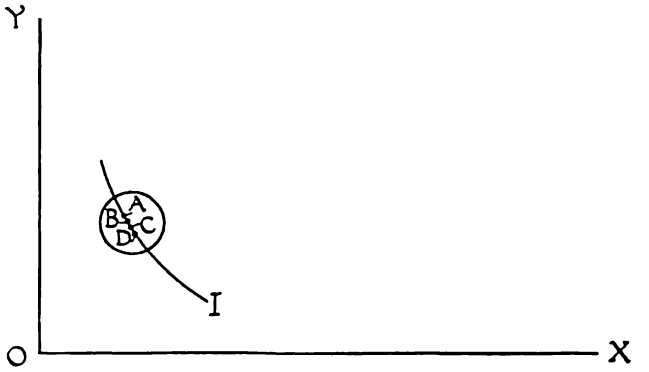

Fig. 16

continuously on curve I. Now each of these points represents a combination of X and Y (two commodities) which is different from the other three. Let us suppose further that the relation of indifference prevails between any pair of two points taken consecutively (AIB, BIC, CID)—the usual case of an indifference curve. On Armstrong's interpretation the consumer will be indifferent, say, between A and B not because the total utility of combination A is identical with the total utility of combination B but because the difference in the total utilities of A and B is so small that it is imperceptible to the consumer (except in the marginal case where the total utilities of A and B may be identical). However, if we compare A to C (or to D) the imperceptible difference between total utilities of A and B and of B and C (or D) may have accumulated so as to become perceptible. In this situation the consumer will either 'prefer' A to C, or conversely C to A (APC or CPA). The relation of indifference which was true (because the difference was imperceptible to the consumer) between A and B and between B and C does not hold between A and C. Once we admit intransitivity of indifference the system of indifference curves breaks down.[1]

[1] Developing his argument further, Armstrong has introduced the notion of 'preference intensity'. In the preference field YOX every point is distinguishable from all others on the basis of preference intensity. However, there may be some points, which though distinguishable on the basis of preference intensity cannot be distinguished by the individual because the difference between their total utilities is so small as to be imperceptible. If we introduce a threshold between the points that can be and that cannot be distinguished, there will be one point that has the greatest preference intensity within the threshold and another point that has the smallest preference intensity outside the threshold. The former Armstrong

A way to circumvent Armstrong's argument has been suggested by Charles Kennedy who has argued for a 'statistical definition' of indifference.[1] This implies that if the consumer is confronted with the same alternatives several times then he chooses each alternative 50 per cent of the time. This definition also seems implicit in one of Samuelson's *obiter dicta*.[2] In psychology it has been a standard definition since Fechner's time. A psychologist has recently accused Armstrong of failing 'to understand that a just noticeable difference (j.n.d.) is a statistical concept'.[3] However, Armstrong was surely right, for the system of indifference curves at the base of the Hicks-Allen theory was built in terms of a *single act* (and not of several acts) of choice. Moreover, in view of the *static* nature of the Hicks-Allen theory, the statistical definition of indifference is likely to violate an important rule of the *ceteris paribus* clause, the assumption of constancy of tastes (conveyed through the stationariness of the indifference curves). With the use of the statistical definition it becomes impossible to distinguish indifference from a change of tastes.

Another serious difficulty which renders the statistical definition of indifference as somewhat otiose arises out of determining the adequacy of the sample-size. Writing in a different context on a similar issue Professor Samuelson (whose own theory is based on a single act of consumer choice) makes some very profound observations. '. . . how many observations is "enough" . . . ?' he asks. And then he exclaims, 'For a long time I have been trying to find a theorem stating the minimum number of situations that will serve . . . I have had no success. If my confidence in my powers were greater, I should be tempted to conjecture that the needed number cannot be specified in advance . . . Light on this open question would be welcome.'[4]

Thus whichever definition of indifference we choose we have a

calls 'marginal indifference', the latter 'marginal preference'. However, if preference intensity is a continuous variable, the two may be treated as equal. ('Utility and the Theory of Welfare', *O.E.P.*, October 1951, pp. 257–71; see especially p. 265).

In a splendid mathematical paper N. Georgescu-Roegen earlier expressed views similar to those of Armstrong. ('The Pure Theory of Consumer's Behaviour', *Q.J.E.*, August 1936, pp. 545–93.)

[1] Charles Kennedy, 'The Common Sense of Indifference Curves', *O.E.P.*, January 1950, pp. 123–31.

[2] P. A. Samuelson, 'Consumption Theory in Terms of Revealed Preference', *Economica*, November 1948, p. 248n.

[3] Ward Edwards, 'The Theory of Decision Making', *Psychological Bulletin*, July 1954, p. 388.

[4] P. A. Samuelson, 'Consumption Theorems in Terms of Overcompensation rather than Indifference Comparisons', *Economica*, February 1953, p. 9.

dilemma. Transitivity being a condition of non-intersecting indifference curves the indifference-preference system will not work if it is proved that indifference is non-transitive. To quote Armstrong, '. . . if indifference is not transitive, then there are no indifference classes, and the textbook diagrams with their masses of non-intersecting indifference curves do not make sense'.[1]

Some recent experimental tests[2] on the transitivity axiom suggest that intransitiveness of preference cannot be ruled out although the evidence for it is not strong. However, from the economist's point of view nothing can be said on the testimony of tests that are performed under 'controlled conditions' and deal with 'imaginary' rather than actual choices. Moreover, the tests performed were related to very simple choices. It may well be that as the choice situation becomes complex the element of intransitiveness may grow.

III

Another angle from which the Hicks-Allen theory has been attacked is the inadequacy of the ordinal utility system to explain individual behaviour when the individual chooses among alternatives involving 'risk' or 'uncertainty of expectation'. This development began with the appearance of von Neumann and Morgenstern's 'Theory' in 1944. Prior to that the discussion of decision-making in risky situations was largely confined to mathematics (the celebrated 'St Petersburg paradox'). In recent years a large body of literature has grown up accounting for the behaviour of the individual in situations that differ in the degree of risk to which he is subject. But from the present point of view it will suffice to mention two rather important papers; (1) 'The Utility Analysis of Choices Involving Risk' by Milton Friedman and L. J. Savage;[3] and (2) 'Uncertainty and the Utility Function' by W. E. Armstrong.[4] Friedman and Savage have dropped the Bernoulli-Marshall hypothesis that the marginal utility of money income to the individual diminishes for all ranges of income and have adopted in its place the hypothesis that the marginal utility of money income to the individual diminishes for incomes up to a certain level, increases between that level and some larger income, and diminishes for all higher incomes. The Friedman-

[1] 'Uncertainty and the Utility Function', *E.J.*, March 1948, p. 3.

[2] A. G. Papandreou, 'An Experimental Test of an Axiom in the Theory of Choice' (Abstract of a paper presented at the Winter meeting of the Econometric Society held in Chicago, December 27–29, 1952), *Econometrica*, July 1953, p. 477; and K. O. May, 'Transitivity, Utility, and Aggregation in Preference Patterns', *Econometrica*, January 1954, pp. 1–13.

[3] *J.P.E.*, August 1948, pp. 279–304.

[4] *E.J.*, March 1948, pp. 1–10.

Savage hypothesis springs from von Neumann and Morgenstern's 'Theory' and furnishes for the first time an integrated and rationalized explanation, within the framework of the cardinal utility system, of an important class of human behaviour, such as 'insurance' and 'gambling',[1] which was incompatible with the universal diminishing marginal utility of income (Marshall's position).[2]

Von Neumann and Morgenstern as well as Armstrong have emphasized that the Hicks-Allen method of analysis of individual behaviour—namely, the ordinal utility system—'breaks down' as soon as we introduce 'uncertainty of expectation with regard to the consequences of choice'. Let us consider a situation in which the individual is confronted with three alternatives, A, B and C, such that he prefers A to B and C to A. Let us suppose that the prospect of A occurring is certain, that of B or C 50–50. In this situation the individual choice will be dictated by comparative ratios of preference intensity. If the ratio of individual's preference intensity for A relative to that for B is much higher than the similar ratio between C and A then the individual will prefer A (certain) to 50–50 chance of B or C. The comparative ratios of preference intensities can be varied to show that in some circumstances the individual will choose 50–50 prospect of B or C to A (certain). It is obvious that an ordinal preference (or utility) system cannot work in the above situation. In order to be able to predict the individual's choice we ought to know his preference for A over B and for C over A. In other words, we must form a quantitative estimate of his preference intensities. A method by which the utility function becomes measurable, except for arbitrary origin and scale (that is, up to a linear transformation), has been suggested by von Neumann and Morgenstern and is as follows:

'Consider three events, C, A, B, for which the order of individual's preferences is the one stated. Let α be a real number between 0 and 1, such that A is exactly equally desirable with the combined event consisting of a chance of probability $1-\alpha$ for B and the remaining

[1] Marshall's theory has 'plenty of room for insurance but none for gambling' (to quote Robertson) which he regarded as an 'economic blunder' even 'when conducted on perfectly fair and even terms'. A theoretically fair insurance, which is the direct converse of gambling, is regarded by Marshall as involving an 'economic gain'. (See Marshall's *Principles*, pp. 135n and 843; and D. H. Robertson, 'Utility and All What', *E.J.*, December 1954, pp. 665–78. Robertson's article offers a further comment on the Friedman-Savage hypothesis. In this connection also see Friedman's 'Utility and All What' and Robertson's 'Rejoinder' thereto in *E.J.*, September 1955, pp. 405–10.

[2] A variant of the Friedman-Savage hypothesis has been produced by H. Markowitz. (See 'The Utility of Wealth', *J.P.E.*, April 1952, pp. 151–8.)

chance of probability α for C. Then we suggest the use of α as a numerical estimate for the ratio of the preference of A over B to that of C over B.'[1]

Though the cardinal utility hypothesis can, and the ordinal utility hypothesis cannot, formalize consumer behaviour when uncertainty is present, it is only after the development of the indifference function that this point became clear. Since 1944 the literature on the subject of the theory of risky choices has been growing rapidly. However, the important issue that breaks into economic analysis at this stage is the 'measurability' of risk (or uncertainty). This is the most important axiom that has been built into the analysis of risky choices since the theory's modern phase began. Most theories that spring from von Neumann and Morgenstern's work follow their practice in axiomatizing that 'economic man' can 'completely order probability combinations' of uncertain alternatives. To obtain the necessary 'numerical foothold' probability is visualized as 'frequency in long runs' rather than as subjective estimation. Though from the point of view of pure logic nothing can be said against this procedure yet, having regard to facts of economic life, the situations in which these requirements can be met, especially the requirement that risk is measurable, are very few. Moreover, in the 'economic markets' in which consumers operate, an overwhelming number of alternatives are not uncertain.[2] If, on the other hand, notwithstanding these mitigating factors, we admit the cardinal utility hypothesis for theoretical reasons, the difficulties become so enormous that the serviceability of the theory from the practical standpoint becomes doubtful. Even Professor Armstrong, whose position may be described as that of a senior spokesman of the cardinal utility club, has admitted this in unambiguous terms. Having argued that the Hicks-Allen theory 'is not merely false but does not work',[3] he continues, '. . . it does not follow that because (cardinal) utility theory can be made to work for the simplified model it can be made to work for the real world. Even a simple economic choice, the spending of a pound, means an infinity of alternatives, and it can

[1] *Theory of Games and Economic Behaviour*, p. 18.

[2] There are many other qualifications of the theory of risky choices which have been criticized, e.g. the assumption that the risk has no utility (or disutility) of its own. Thus Professor Robertson once wrote, 'For this reason, i.e. because they ignore the pleasures or pains of uncertainty bearing *per se*, I am less excited than as a member of the Cardinal Club, I should wish to be by the additional evidence in favour of cardinalism which has been turned out by the N and M (Neumann and Morgenstern) and F and S (Friedman and Savage) machines'. ('Utility and All What', *E.J.*, December 1954, p. 674.)

[3] 'Uncertainty and Utility Function', *E.J.*, March 1948, pp. 1 and 6 respectively.

legitimately be questioned whether even (cardinal) utility theory can be made to work for situations in which there may well be an infinite variety of alternatives as well as an infinite diversity of expectations.'[1] The resolution of the difficulty posed by these considerations forces the economic theorist to answer an awkward, but nevertheless important, methodological question, 'what to sacrifice when the two are in conflict—the logical method or fidelity to facts?'

IV

In the third place, the indifference analysis has been criticized for its low empiric content. That the theory as it matured in the hands of Professor Hicks is a model of self-consistent logic is not here denied.[2] What is criticized is the gap between pure and applied logic of the theory. This, we believe, is the position of some leading critics (like Armstrong, Clark, Knight, Robertson and Schumpeter).[3] As we have noted earlier,[4] Pareto worked with indifference curves derived from utility functions. In his hand the theory of consumer's choice remained subjective. In the Hicks-Allen theory the indifference curves are not based on introspectively obtained utility functions. They are introduced as a postulate of the system. This behaviouristic slant has been interpreted by critics negatively. Thus Knight lamented the failure of the indifference-preference school 'to bring the behaviour facts into some intelligible relations of subjective experience'[5] (the procedure of utility theorists). More recently he has pleaded again against the compromise which the indifference analysis offers. His view is that either the economist should seek to explain consumer behaviour or he should not. If the former is the case then there is a strong argument for the more explanatory

[1] 'Uncertainty and Utility Function', *E.J.*, March 1948, pp, 1 and 6 respectively.

[2] Such a view is possible if the assumptions of the theory are granted. Professor Armstrong who denies transitiveness of indifference (which is an important assumption of the Hicks-Allen theory) once observed, 'Unfortunately, a theory of the above (Hicks-Allen) kind is ruled out by purely logical considerations.' ('A Note on the Theory of Consumer's Behaviour', *O.E.P.*, January 1950, p. 119.)

[3] W. E. Armstrong, 'Uncertainty and the Utility Function', *E.J.*, March 1948, pp. 1–10; J. M. Clark, 'Realism and Relevance in the Theory of Demand', *J.P.E.*, August 1946, pp. 347–53; F. H. Knight, 'Realism and Relevance in the Theory of Demand', *J.P.E.*, December 1944, pp. 289–318; D. H. Robertson, *Utility and All That* (1952), Chapter 1 (same heading as the book) and Chapter 4 ('A Revolutionist's Handbook'); and J. A. Schumpeter, *History of Economic Analysis* (1954), pp. 1053–69 (see especially p. 1067).

See also R. L. Bishop's article, 'Professor Knight and the Theory of Demand', and Knight's 'Comment on Mr. Bishop's Article', *J.P.E.*, April 1946, pp. 141–76.

[4] See above, p. 46.

[5] 'Realism and Relevance in the Theory of Demand', *J.P.E.*, December 1944, p. 293.

cardinal utility theory which goes behind the observed market behaviour, to explain it subjectively. If it is the latter then he (the economist) should 'set up functions and curves in purely objective' (behaviouristic terms).[1] This is asking him to go back to the demand curve as an empirical (statistical) fact, *à la* Cournot. In the same vein Professor Schumpeter characterized 'indifference varieties' as 'a midway house'.[2] From the practical point of view there would be no objection to allowing the indifference curves to stand as purely objective, portraying facts of consumer behaviour, if it were possible to secure the quantitative data for them. As things are, in the Hicks-Allen theory they appear as an inference from hypothetical experimentation. And as Schumpeter remarks, 'if they use nothing that is not observable *in principle*, they do use "potential" observations which so far nobody has been able to make *in fact:* from a practical standpoint we are not much better off when drawing purely imaginary indifference curves than we are when speaking of purely imaginary utility functions'.[3]

Some attempts at experimental measurement of indifference curves have been made by psychologists and economists.[4] Though a limited success has been reported, it may be pointed out that all these experiments were conducted under controlled conditions. The subjects were required to choose from hypothetical rather than actual sets of goods. So that from the economist's point of view the indifference curves still remain imaginary.[5] Two American economists who examined the characteristics of the indifference function from the point of view of empirical analysis found against its 'material value' for the purpose of organizing 'empirical data'.[6] Their argument establishes that the difficulty of quantifying indifference functions arises out of the peculiar logical structure of the theory and is not to be interpreted as reflecting lack of data or inadequacy of statistical techniques.

[1] 'Introduction' to Carl Menger's *Principles of Economics*, p. 20.

[2] *History of Economic Analysis*, p. 1066.

[3] *Ibid.*, p. 1067.

[4] L. L. Thurstone, 'The Indifference Function', *J.S.P.*, May 1931, pp. 139–67; and S. W. Rousseas and A. G. Hart, 'Experimental Verification of a Composite Indifference Map', *J.P.E.*, August 1951, pp. 288–318.

[5] Successful experimentation with measurement of indifference curves through the application of psychophysical techniques requires control of circumstances of the 'subjects' to such an extent as to take the entire phenomenon into the realm of bloodless abstraction from reality. 'Economic stimuli' to which the 'response mechanism' reacts are not only not amenable to such a degree of control but are themselves 'continually evolving' with the passage of time.

[6] W. A. Wallis and M. Friedman, 'The Empirical Derivation of Indifference Functions', in *Studies in Mathematical Economics and Econometrics* (1942), edited by O. Lange and others.

Among less emphasized points of criticism, Dr Norris has drawn attention to Hicks's failure to incorporate changes made necessary by the development of the theory of monopolistic competition.[1] Thus the assumptions of homogeneous goods and perfect competition are cited as examples. It may be pointed out that while Marshall's theory can deal with the problem of differentiated products because of its system of cardinal utility rating, the second objection (to perfect competition assumption) is applicable to a large part of the classical theory.

Lastly, a word from that eminent mathematical economist N. Georgescu-Roegen about the point of view, often bandied about by the indifference school, that cardinal utility is in any case unnecessary for a theory of consumer's choice (Occam's razor principle); i.e. the argument that the ordinal utility analysis is logically more economical, since it requires fewer assumptions, than the cardinal utility analysis. Writing on complementarity he makes the all-important observation that this point of view is 'very weak scientifically'. He asks, 'Could we refuse to take account of animals with more than two feet, on the ground that only two feet are needed for walking?'[2]

V

We may now turn to the development which we mentioned at the beginning as the third root of the logical theory of demand, the 'Revealed Preference' hypothesis. If we were to sum up the course of development of the pure theory of demand, we would describe it as a move from psychological to behaviouristic explanations of consumers' behaviour in 'economic markets'. The utility theory was purely subjective. It sought to explain observed consumer behaviour in terms of motivation and psychological valuation. The indifference-curve analysis took the observed behaviour as an ultimate fact. It did not seek to explain it. To that extent it released the theory of consumer's choice from psychological implications. But until a satisfactory method of deriving quantitative counterparts of indifference functions from empirical analysis is discovered—of which there seems to be no promise—the indifference curves remain a sort of psychological postulate. Professor Schumpeter's characterization of the Hicks-Allen theory as 'midway house' reflects a correct estimation of its status judged on our analysis. The growing desire of the rank and file of economists to have a 'scientific' (meaning 'behaviouristic' as against 'psychological') explanation of consumers' be-

[1] R. T. Norris, *The Theory of Consumer's Demand* (1941), revised edition 1952; see especially Chapter III.

[2] 'A Diagrammatic Analysis of Complementarity', *S.E.J.*, July 1952, p. 2, n7.

haviour[1] gradually led to the development of a method that seeks to enunciate the demand theorem from observed consumer behaviour.

The new method adopts an hypothesis suggested by Samuelson in 1938 and utilized more recently by him[2] and others for a variety of economic constructions. The hypothesis comprises a presumption that 'choice' reveals 'preference'. Its definition and supporting 'argument' as developed by the sponsor are as follows:

'Through any observed equilibrium point, A, draw the budget-equation straight line with arithmetical slope given by the observed price ratio. Then all combinations of goods on or within the budget line could have been bought in preference to what was actually bought. But they weren't. Hence they are all 'revealed' to be inferior to A. No other line of reasoning is needed.'[3]

Let this situation be represented in the following diagram. X and Y are the two commodities. MN is the budget line. MON represents

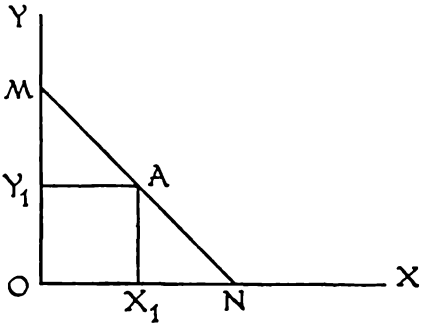

Fig. 17

[1] To state that the behaviouristic approach is more desirable than the psychological, is quite a different matter. In spite of behaviouristic trends in economic science some leading economic lights continue to favour the more-inclusive (eclectic) methods. Professor Knight who belongs to the philosophical-psychological school of thinkers has characterized the scientific approach as the 'recourse' of those who worship the 'Occam's razor'. (Introduction to Carl Menger's *Principles*, p. 20.)

[2] P. A. Samuelson, A Note on the 'Pure Theory of Consumer's Behaviour', *Economica*, February 1938, pp. 61–71; 'An Addendum' to this 'Note', *Economica*, August 1938, pp. 353–4; 'Consumption Theory in Terms of Revealed Preference', *Economica*, November 1948, pp. 243–53; 'The Problem of Integrability in Utility Theory', *Economica*, November 1950, pp. 355–85; 'Consumption Theorems in Terms of Overcompensation rather than Indifference Comparisons', *Economica*, February 1953, pp. 1–9.

[3] 'Consumption Theory in Terms of Revealed Preference', *Economica*, November 1948, p. 244.

the consumer's choice triangle. $A(X_1, Y_1)$ represents the actual consumer choice (the position of equilibrium). With money income given (OM in terms of Y or ON in terms of X), the consumer can buy any combination of X and Y lying on or within the triangle MON. In choosing A the consumer is revealing his preference for A over all other combinations that were possible. The sequence of events by which choice becomes preference is neither indicated nor considered by the sponsors of the theory. The 'inference' that choice is preference thus becomes axiomatic and may be taken as an implicit underlying assumption of the theory.

As presented by Samuelson the theory has been raised on the strong form of the preference hypothesis; that is, it excludes the relation of indifference between various alternative situations. Thus in Figure 17 the consumer is shown to prefer A to all other available alternatives 'in or on the triangle'. In its weak form (as in the revised version of the Hicks-Allen theory in which Hicks drops the assumption of 'complete' ordering and works with the weak form of the preference hypothesis) A will be shown to be preferred to all the positions within the triangle and will be either preferred or indifferent to positions on the budget line MN.

As is clear from his above-mentioned definition of revealed preference, Samuelson's preference is not a statistical concept. It derives its whole meaning from a single-choice situation in which the consumer buys a particular batch of goods, A, while he could have bought any of the alternatives on or within the budget line. Unless the consumer has an opportunity to exercise his choice several times (in similar circumstances) he has no way of revealing his 'indifference' for any other batch(es) of goods in his market behaviour. Thus the rejection of indifference in Samuelson's theory follows from his methodology.[1] In general Samuelson's methodological position is that of an 'eclectic'. In the debate on consumer's choice he has carefully avoided taking sides. Repeating an earlier assertion he observed, 'I think it important to know what one can and cannot constructively accomplish with a finite set of data . . . I see no reason in principle to eschew the use of constructions that involve indifference between various situations.'[2]

The assumption of rationality which underlies all logical explanations of consumers' behaviour and which we have previously analysed in our discussion of marginal utility and indifference-preference formulations has been remarkably pruned. It appears in

[1] Tapas Majumdar has earlier taken a similar view. See his *Measurement of Utility*, p. 82.

[2] 'Consumption Theorems in Terms of Overcompensation rather than Indifference Comparisons', *Economica*, February 1953, p. 3.

the new form of analysis as a single basic assumption of the theory and has been christened the 'Consistency Postulate'. In the first formulation of his theory of consumer's behaviour Samuelson adopted the following three assumptions:

1. That the amount demanded of each commodity is a single valued function of all prices and income; that is, confronted with a given set of prices and income the consumer will always choose the same set of commodities.
2. That the above function is homogeneous of order zero in the variables prices and income; that is, if we multiply all prices and income by the same positive quantity, the quantities demanded will remain invariant.
3. That if the individual consumer selects (prefers) batch I over batch II, he does not at the same time select (prefer) batch II over I.[1]

Subsequently Samuelson discovered that postulates 1 and 2 were implied in postulate 3 and hence redundant. The postulational base of the theory was accordingly revised, omitting the first two postulates and retaining the third to provide the consistency test for the rational behaviour of the idealized consumer. This postulate is the exact logical equivalent of Hicks's formulation of consistent consumer behaviour in his *Revision of Demand Theory*. He calls it the 'Direct Consistency Test' which obeys two conditions: (1) if Q is left of P, P must be right of Q; and (2) if Q is right of P, P must be left of Q (the two-term consistency).[2] An alternative formulation would be: if A is shown to be preferred to B in situation I, B cannot be shown to be preferred to A in situation II (assuming that both A and B are available in both the situations and the consumer's tastes remain unchanged).[3]

The revealed preference theorem can also be translated into index-number form. If in situations I and II, Q_1 and Q_2 are the batches of goods and P_1 and P_2 the respective price sets, then the statement that the consumer chooses Q_1 over Q_2 can be expressed by the formula that $\Sigma P_1Q_1 > \Sigma P_1Q_2$. Since ΣP_1Q_1 stands for the total expenditure on the batch of goods Q_1 and ΣP_1Q_2 the total expenditure on the batch of goods Q_2 (when P_1 prices prevailed), the condition $\Sigma P_1Q_1 > \Sigma P_1Q_2$ indicates that the consumer could have bought Q_2 when he bought Q_1 by spending his income on Q_2 instead of on Q_1. However, the index-number formulation is only

[1] Samuelson's article and addendum thereto in *Economica*, 1938, already referred to (see above, p. 65n).
[2] *Op. cit.*, Chapters IV and VI.
[3] *Op. cit.*, Chapter VI.

tautological and has no additional economic meaning except that for some constructions it may be more convenient.

As we have noticed earlier, the revealed preference hypothesis is in the nature of a fundament on which a variety of economic propositions can be made to rest. Like the cardinal utility hypothesis the notion of revealed preference provides the basis for demand theory as well as welfare economics, though the scope of revealed preference hypothesis is relatively much restricted. Owing to the limited scope of our inquiry we shall only deal with the utilization of revealed preference hypothesis for the purposes of enunciating the demand theorem.

In what follows we shall paraphrase the latest of Samuelson's attempts to deduce the equivalent of the 'simple and basic Marshallian proposition' that 'An increase in a good's price must, if income and other prices are held constant, decrease the amount of it demanded.'[1]

Samuelson's theory is based on a logical deduction that positive-income elasticity implies negative price-elasticity. As a first step he develops what he calls the 'Fundamental Theorem of Consumption Theory'. This is as follows:

'Any good (simple or composite) that is known always to increase in demand when money income alone rises must definitely shrink in demand when its price alone rises.'[2]

He then demonstrates that a proof of the Fundamental Theorem is possible in plain words as well as geometrically and analytically. The geometric argument is simple and will suffice for our purposes.

Suppose that X and Y are two commodities, X simple, Y composite; OM in terms of Y is the consumer's income (=ON expenditure on X if the consumer spends all his income on X); and MN the budget line based on the price of X given on the market. The point A indicates the consumer's choice (hence also his preference, by the pre-established definition that 'choice' reveals 'preference') in the price-income situation MN.

Suppose that the price of X rises so that MP becomes the new budget line. We have to prove now that the consumer's purchase of X is less than X_1 (his purchase of X at the original price).

Let us 'overcompensate' the consumer by giving him enough extra money income to enable him to buy exactly the same quantity of X as he would have bought before the rise in the price of X. This is

[1] 'Consumption Theorems in Terms of Overcompensation . . .', *Economica*, February 1953, p. 1.
[2] *Ibid.*, p. 2.

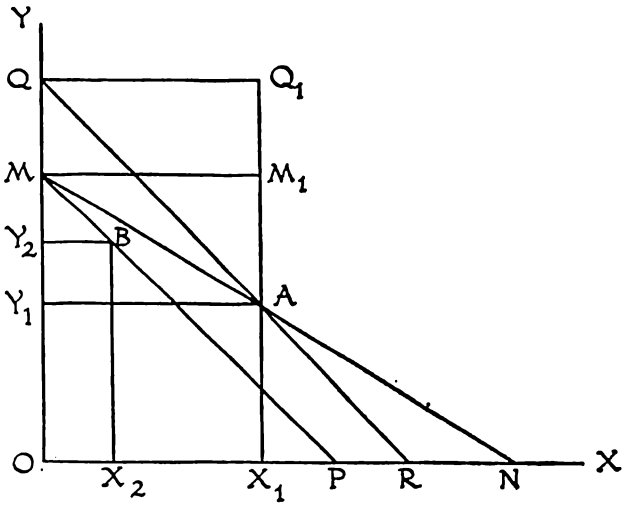

Fig. 18

represented in terms of Y by the amount MQ.[1] After the 'over-compensation effect' has taken place the new budget line (QR) must pass through A and lie parallel to the budget line MP. This gives us ORQ as the consumer's triangle of choice. Since before the rise in the price of X, A was chosen (=preferred) to all the alternatives available in or on the triangle MON, the alternatives lying on the AR portion of the budget line QR must be considered as 'rejected' in favour of A which means that the consumer's choice lies on AQ. It is obvious that any point on AQ reveals that the consumer's purchase of X has shrunk (except in the marginal case of point A where it remains the same as before). It is highly probable that the consumer will reduce his consumption of X, as X (after the rise in its price) has become relatively dearer. To distinguish this kind of 'substitution effect' from the Hicks-Allen kind of 'substitution effect' Samuelson has called

[1] This method of varying the consumer's income so as to neutralize the difference between the cost of his consumption of X at the old and the new prices has been called by Hicks the 'cost difference'. It has been further distinguished from an alternative method, the method of the 'compensating variation', employed by him in his 'Value and Capital'. The compensating variation is the method of an adjustment in the consumer's money income after a fall in the price of a good that exactly neutralizes the gain in his real income and leaves him no better off than before. However, Hicks has admitted that for the purpose of establishment of the law of demand, the method of cost difference is more convenient. It follows from their respective definitions that as a general rule the compensating variation will 'tend to exceed' the cost difference for a fall in price but will fall short of it for a rise in price. (See *Value and Capital*, pp. 38–41; and *A Revision of Demand Theory*, Chapters VII and VIII.)

it the 'overcompensation effect'. The 'overcompensation effect' like the Slutsky 'substitution effect' permits the consumer to shift to a higher indifference curve. As has been noted earlier,[1] the Hicks-Allen 'substitution effect' takes place along a given indifference curve.

Since purchases along AQ are possible only after the consumer's money income has been increased through the 'overcompensation effect', it is obvious that when the 'gift of extra money income' is withdrawn, leaving the consumer with his original money income but the enhanced price of X, his purchase of X must be to the left of X_1—somewhere on the budget line MP (say, at B where he purchases X_2 of X). This conclusion will be valid only if we assume that the income-elasticity of demand for X is positive. Since the Fundamental Theorem has been made conditional on the fulfilment of this qualification, there is no theoretical difficulty here. This second stage can be legitimately compared to the 'income-effect' in the Hicks-Allen theory.

There are two important qualifications which are implicit in Samuelson's theory but have not been explicitly stated. In the first place, the consumer is debarred from choosing any alternative from within the choice triangles MON and MOP by the non-saturation axiom, that is, by assuming that the consumer prefers a larger collection of goods to a smaller. In the second place, he is shown to choose only one collection of goods in every price-income situation. Granting these two qualifications as well as the consistency postulate and the assumption of a positive income-elasticity of demand, the Fundamental Theorem that the demand for any good must definitely shrink when its price alone rises is established. Thus the inverse price-quantity relationship of Marshallian law of demand is obtained by assuming that the income-elasticity of demand for any consumption good is always positive.

The Fundamental Theorem, that positive income-elasticity implies negative price elasticity, can similarly be expounded in terms of a fall in price; the graphical proof and the literary argument supporting it can be set up in the reverse direction.]

VI

This approach leaves on one side an interesting development initiated by Paul Samuelson himself and I. M. D. Little, and further developed by H. S. Houthakker.[2] Samuelson and Little demon-

[1] See above, pp. 47–8.

[2] See Samuelson's articles in *Economica*, 1938, 1948 and 1950, cited on page 65n; also his *Foundations of Economic Analysis* (1947), Chapters V, VI and VII;

strated that if we could observe for any individual a number of price-quantity situations relating to two goods, X and Y, then it is possible to define a locus which is the exact equivalent of the indifference curve. Since Little rules out the concept of indifference in single-choice situations as non-observable, hence also non-operational, he insists on calling the resultant boundary curve a 'behaviour line'. This unique curve is the limiting locus of revealed preference. Thus in the consumer's preference field if we consider some given batch of goods A, then according to the behaviour line passing through A, all the batches above A are preferred to A and all the batches below A are rejected in favour of A. Samuelson's alternative mathematical method established a similar frontier for every point in the consumer's preference field. Samuelson's proof consists of showing that all the points above the frontier of some given point, say A, are revealed to be superior to A and all the points below the frontier of A are revealed to be inferior to A. Though both Little and Samuelson have built their analysis by using only 'strong ordering' (which excludes the relation of indifference) there is a difference in their respective positions. Little drops 'indifference' as completely inadmissible. Samuelson sees 'no reason in principle to eschew the use of constructions that involve indifference between various situations'.[1] Samuelson calls his 'frontier' locus the 'solution contour' and does not mind giving it 'by courtesy, the title of an indifference curve'.[2] Furthermore unlike Little's behaviour line that refers only to the one given point to which it relates, Samuelson's 'frontier locus' does not rule out the possibility of more than the one chosen point. However, these other points 'can never themselves be revealed to be better or worse'[3] than the chosen point. Besides Little and Samuelson, Houthakker has also proved that *formally* the 'revealed preference' approach to the theory of consumer's behaviour is equivalent to the 'utility function' or 'indifference function' approach. His procedure is, however, somewhat different. Unlike Little and Samuelson who worked out the theory for the case of two goods, Houthakker does not restrict the number of goods. He has argued that normally both 'preference' and 'indifference' involve transitivity. His theory is based on an axiom that extends the revealed preference relation to

I. M. D. Little, 'A Reformulation of the Theory of Consumer's Behaviour', *O.E.P.*, January 1949, pp. 90–9; also Chapters I, II and Appendix II in his book, *A Critique of Welfare Economics* (1950), revised ed., 1957; and H. S. Houthakker, 'Revealed Preference and the Utility Function, *Economica*, May 1950, pp. 159–74.

[1] 'Consumption Theorems in Terms of Overcompensation . . .', *Economica*, February 1953, p. 3.

[2] and [3]. 'Consumption Theory in Terms of Revealed Preference', *Economica*, November 1948, pp. 248 and 215 respectively.

make it 'semi-transitive' instead of only 'asymmetric'.[1] The semi-transitivity axiom enables Houthakker to deduce 'integrability' for indifference surfaces which he constructs using only the axioms of revealed preference. This filled a genuine gap in Samuelson's theory. Houthakker has also shown that the problem of integrability (which is the logical counterpart of transitivity in the non-mathematical theory) does not arise in Little's and Samuelson's theories as these theories deal only with the case of two commodities. Once the bases of the theory are widened to include the general case of n commodites the problem of deducing integrability must be solved. In the mathematical theory of consumer's behaviour integrability is necessary to ensure that the consumer's revealed preference is 'non-contradictory'.

VII

The last two sections (V and VI) show that the revealed preference approach to the theory of demand has followed two lines of development. Chronologically, the approach of Section VI came to be developed first. It is an indirect approach in the sense that all three exponents of this method—Samuelson, Little and Houthakker—show that a consistent set of indifference curves for an individual can be generated by using the technique of revealed preference requiring only 'The triplet of numbers (p_x/p_y, x, y)'. Once the indifference curves are obtained, all the results of the Slutsky-Hicks-Allen theory follow. This method of revealed preference, first converting itself into the indifference curve analysis, has more recently been abandoned by Samuelson who has provided a direct logical link between revealed preference and the demand theorem. Samuelson's second theory was paraphrased above and is considered further in the following paragraphs.

VIII

A casual observer coming to Samuelson's latest theory via the Hicksian labyrinth of 'indifference' and 'income and substitution effects' will at once be struck by the fact that Samuelson's theory has some important gaps. In the first place, it does not take cognizance of the possibility of 'indifference' in consumer behaviour, which is contrary to general experience. It can happen that the batch

[1] 'Asymmetry' means that for any two batches of goods A and B if A is preferred to B, then B is not preferred to A. 'Semitransitivity' implies that if A is preferred to B, B to C, C to D . . ., and Y to Z, then Z (the last in the chain) cannot be preferred to A.

actually chosen by the consumer (A in Figure 19) is one of the few between which the consumer is indifferent. If we admit this possibility, then the proof which Samuelson's theory offers to establish the limited character of the Law of Demand breaks down. Suppose that in the following diagram, (i) MN is the original budget line,

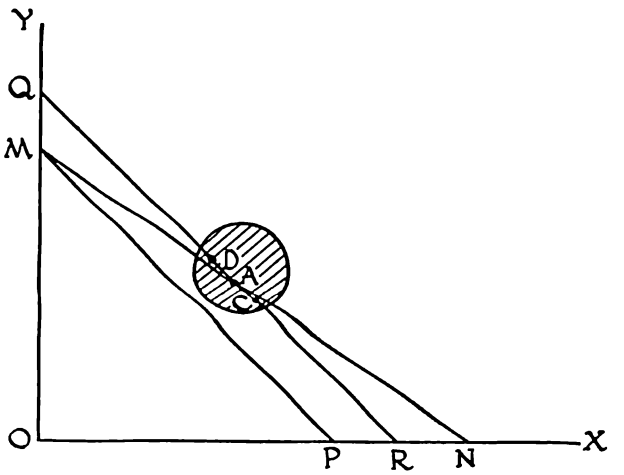

Fig. 19

(ii) A the consumer's actual choice in this price-income situation, (iii) MP the new budget line, after the market price of X has risen and (iv) MQ the gift of money income to make it possible for the consumer to continue buying A should he choose to do so. Let us now suppose that the consumer is indifferent between the batches falling in the shaded area. We can always pick a point C on AR which might be chosen rather than D (or any other point on AQ), which vitiated Samuelson's proof.[1] In the second place, since Samuelson's theory argues deductively from positive income-

[1] This criticism based on Armstrong's arguments will however violate Samuelson's assumption of 'single valued demand functions'. Professor Samuelson has (in a private letter) commented on this point as follows:

'Under the usual strong postulates of revealed preference theory, I end up with results that are identical with those of the conventional theory (of Slutsky, Hicks, *et al*). So any valid Armstrong objections that are valid against that theory must also be valid against revealed preference. Thus Armstrong's notion that there are points on every side of a given point indifferent to it would violate my postulate of single-valued demand functions, with quantity that *must* rise with an increase in income. (*His* guinea pig could choose to keep the old consumption levels even with income up.)

'Note: without strong postulates no one can devise strong theorems. It is (on

elasticity to negative price-elasticity, it can recognize only the income effect generated by a given change in the price. As the response of the individual to a change in the price is a composite of income and substitution effects, it follows that Samuelson's theory offers only a partial demand explanation. From the empirical (though, of course, certainly not from the theoretical) point of view the exclusion of substitution effect can be justified on the ground that on the plane of observation the income and the substitution effects are indistinguishable.[1] In the third place, it will be noticed that the Samuelsonian demand theorem is conditional. It infers that if income-elasticities are positive, price-elasticities will be negative. Forestalling this criticism Samuelson attempted its refutation in advance (again on empirical grounds). 'Since as casual or systematic econometricians we know that most goods obey Engel's Laws corresponding to consumption increasing absolutely with increases in money income, this (his) Fundamental Theorem of consumption theory enables us to infer that most Marshallian price-elasticities of demand are definitely negative.'[2] Samuelson's theory cannot enunciate the demand theory where the income-elasticity of demand is non-positive. This means that 'Giffen's Paradox', so much fussed about in the analysis of demand, cannot be accounted for in Samuelson's theory. When compared to Marshall's law of demand or the Hicks-Allen law of demand, Samuelson's law of demand is less inclusive. While the Hicks-Allen formulation provides an integrated explanation both for the 'income' and 'substitution' effects as well as Giffen's Paradox, the Marshallian law does so only for the 'income' and 'substitution' effects (without separating the effects analytically). Giffen's case, as we have already noted, is an unaccounted for exception in the Marshallian formulation and to that extent it negates the law. As we have remarked above, Samuelson's theory does not recognize the substitution effect following a change in the price. About Giffen's Paradox Samuelson's position is follows: 'But the phenomenon of Giffen's Paradox reminds us that the Marshallian proposition is not a true theorem, and it is rather to a theory's credit than discredit if it refuses to enunciate a false theorem.'[3] On Samuelson's analysis the only valid theorem in the Demand Theory is the one that links inversely income to price elasticity.

principle) a testable hypothesis that people satisfy my axioms—or instead behave as Armstrong says they do. My job was to show the empirical implications of choice theory, not to insist that these are always or usually met.'

[1] The substitution effect can be recognized only for the case where the income elasticity of demand is zero.

[2] 'Consumption Theorems in Terms of Overcompensation . . .', *Economica*, February 1953, p. 2.

[3] *Ibid.*, p. 1.

Among other points of criticism objections have also been raised to Samuelson's interpretation of 'choice' as 'preference'. As one critic has recently observed, 'Indeed, this recklessly non-operational interpretation has long been abandoned by those concerned to preserve their methodological chastity'.[1] However, it may be pointed out that the fact that the consumer chooses A while he could have chosen any of the several alternatives open to him in the given price-income situation may be interpreted as revealing his preference, is a direct inference from the assumption of consistent behaviour (raised on 'strong ordering'). Whether it is also a true one is a different matter. So long as the economic theorist keeps to the methodological strait-jacket of working with the assumption of 'rational' behaviour such dubious definitions are bound to creep in.

On the positive side the 'revealed preference' approach has scored some points against the 'cardinal utility' and 'indifference preference' approaches. It is the first behaviouristic attempt to formalize consumer's behaviour from market observations alone. Commenting on the two earlier formulations, Samuelson remarks: 'For just as we do not claim to know by introspection the behaviour of utility, many will argue we cannot know the behaviour of ratios of marginal utilities or of indifference directions.'[2] Likewise 'The introduction and meaning of the marginal rate of substitution as an entity independent of any psychological, introspective implications would be, to say the least, ambiguous, and would seem an artificial convention in the explanation of price behaviour.'[3] His own theory Samuelson thinks sloughs off 'the last vestiges' of the psychological analysis in the explanation of consumer's behaviour. In the second place, Samuelson's theory eschews some of the assumptions underlying the two alternative formulations. Thus it drops 'utility maximization' and 'continuity' assumptions which means that rationalizing the individual's behaviour in Samuelson's theory is less difficult than in the other two models. As we have noted earlier,[4] Hicks also drops the assumption of continuity in his *Revision of Demand Theory*.

An extended comment on the alternative approach of Samuelson-Little-Houthakker is unnecessary. This approach sets up a theory of consumer's behaviour which is the precise equivalent of the Slutsky-Hicks-Allen approach. Critical observations made earlier on the

[1] E. J. Mishan, 'Theories of Consumer's Behaviour: A Cynical View', *Economica*, February 1961, p. 5n.

[2] 'A Note on the Pure Theory of Consumer's Behaviour', *Economica*, February 1938, p. 61.

[3] *Ibid.*, p. 62.

[4] See above, p. 38n.

indifference-preference analysis will seem to hold good also for this theory.

IX

This survey by no means exhausts the content of the recent debate on demand analysis. But we hope to have conveyed the essentials of what we described in the beginning as the three main roots of the logical theory of demand. A cursory look at the contents of some of the leading academic journals (e.g. *Economic Journal*, *Economica*, *Oxford Economic Papers*, etc.) will readily reveal the multi-dimensional character of the discussion. But it will be realized that most of these contributions have very little economic content. Most writers seem to explore either the meaning and logical implications of the consistency assumption about human behaviour or else try to rewrite the existing theories in terms of 'relational logic' made familiar to economists by the work of Professor K. J. Arrow.[1]

[1] See his book, *Social Choice and Individual Values*, 1951. Robertson speaks of Arrow as 'a convinced and eminent ordinalist'. See his 'Utility and All What', *E.J.*, December 1954, p. 667.

Appendix to Chapter 4

NEUMANN-MORGENTERN METHOD OF MEASURING UTILITY

Assumptions:

1. The 'economic man' can 'completely order probability combinations' of uncertain alternatives.
2. He maximizes 'expected utility'.
3. Risk (or uncertainty) has no utility (or disutility) of its own.

Consider three events C, A, B, for which the order of the individual's preference is the one stated. Suppose they are plotted on the x-axis as points C, A, B. The distance between any two points represents the measure of the individual's preference.

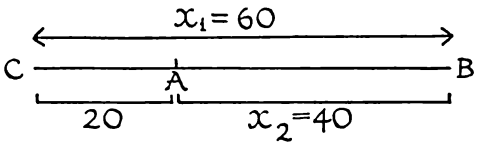

Fig. 20

$CB = x_1$ $\qquad$ $AB = x_2$

Let $\frac{x_2}{x_1} = \alpha$. Then α will necessarily lie between 0 and 1, as x_1 must be greater than or equal to x_2.

If the availability of B or C is with probabilities $1-\alpha$ and α respectively then the individual will be indifferent to the choice of A as against the choice of B or C. In this situation α may be termed the probability equivalent of his indifference between A and B or C.

Let $x_1 = 60$ $\qquad$ $x_2 = 40$; then $\alpha = \frac{2}{3}$

A (certain) $\qquad$ B (probability $\frac{1}{3}$) $\qquad$ C (probability $\frac{2}{3}$)

(i) If the probabilities of getting B or C are $\frac{1}{2}$ and $\frac{1}{2}$ then the individual will choose A as against B or C because his 'expected gain in utility' consequent on the choice of B or C will be less than the one obtained from the choice of A.

(ii) If the probabilities are $\frac{1}{3}$ and $\frac{2}{3}$, i.e. they are the same as worked out on the assumption of indifference, then the individual will be indifferent to the choice of A against B or C.

(iii) If the probabilities are $\frac{1}{6}$ and $\frac{4}{6}$ then the individual will choose B or C in preference to A.

PART II

Chapter 5

ASPECTS OF UNDERDEVELOPED ECONOMIES

In Part I we have attempted to give a systematic exposition of received micro analysis of demand. The aim was to clarify issues and state an up-to-date position in non-mathematical terms. The fabric out of which the analysis was woven was certain 'hypotheses' whose nature was presumptive. Investigation from the empirical point of view is necessary to demonstrate the insufficiency of false hypotheses and to confirm the accuracy of correct ones. Several attempts by this writer to discover a method for the empirical testing of these hypotheses have led him to believe that the micro theory of demand, as it is, is non-testable. None of the functions underlying the theory are amenable to quantification. As mentioned before,[1] this situation is due to the peculiar logical structure of the theory and is not to be taken as a reflection on the adequacy of statistical techniques. Under these circumstances the testing of the theory from the point of view of both its meaningfulness and usefulness in the context of a particular economy has to be conducted by asking suitable questions in a general form.

However, the situation is not as hopeless as might appear at first sight. After all, the aim of the theory is to establish the nature of demand for various goods. No attempt is made to state this relationship in any quantitative form. So long as the law of demand remains directional, it can be refuted or confirmed by asking a few general questions about the behaviour of factors that come into the picture, e.g. incomes, prices, tastes, and so on.

Economics being a social science, its laws can acquire meaning, apart from their value as abstract truth, only when they are related to practical reality. To emphasize a test of Léon Walras, in social sciences the 'ideal-type concepts' which abstract from reality in the first instance so that '*a priori*' framework of 'theorems and proofs' may be constructed must eventually be convertible into 'real-type

[1] Chapters 2 and 4.

concepts . . . with a view to practical applications'.[1] A similar test has been proposed by Professor Gunnar Myrdal. Speaking of 'The Logical Crux of All Sciences' he observes, 'As the theory is merely a hypothesis, the criterion of its truth can never be anything else than the pragmatic one of its usefulness in bringing our observations of facts into a meaningful and non-contradictory system of knowledge . . . When the observations of facts do not agree with a theory . . . The theory has to be discarded and replaced by another one which promises a better fit.'[2]

II

As things are, there is a large variety of economic orders (or systems) prevailing in different parts of the world. Moreover, the historical patterns which these orders are following in their evolution vary. It follows that if economic theory has to be comprehensible in relation to a particular economic society, the assumptions of the theory must lie close to the facts of economic life in that society.

The pattern selected to provide a backdrop for the present inquiry is an 'underdeveloped' economy which has adopted the technique of state planning to secure rapid economic growth within the initial framework of free enterprise society. It is some sort of a transition society which is aware of the fact that it is such and is consciously engaged in the process of transition. In the following paragraphs an attempt will be made to give a broad outline of such a society and its economic activities. India may be taken as a practical example resembling this theoretical model. But the analysis developed here will apply to many underdeveloped countries following the same path as India; e.g. Burma, Ceylon, Egypt, Pakistan, etc. Chapter 6 brings out the role of demand theory as an aid to economic policy in underdeveloped countries. This is followed in Chapter 7 by a general discussion to determine the extent to which the assumptions of the Law of Demand hold good for the chosen model. At the present time the intellectual air in underdeveloped countries is full of scepticism towards a large part of the existing body of economic doctrine. Most social scientists in these countries seem to do without a general theory. Myrdal recently described this state of affairs as 'a sound reaction' on the part of those who are devoting their efforts to the problems of the underdeveloped countries. He further spoke of this

[1] *Elements of Pure Economics*, French edition definitive 1926; English translation by William Jaffé, 1954, p. 71.

[2] *Economic Theory and Under-Developed Regions* (1957), p. 161.

'untheoretical twist' as 'a safer course than using one that is biased and faulty'.[1]

III

In economic analysis the term 'underdeveloped', like the adjective 'free', has no political or cultural significance. It merely refers to the fact that a country has low *per capita* income which can be increased by a suitable development of its resources, both natural and human. However, in the literature on the subject of growth several other criteria have been suggested and used.

1. In the first place, a country is regarded as underdeveloped if it has small capital per head of population. The most commonly used criterion in this case is the marginal productivity function of capital. If this function is low, the country is said to be developed and vice versa. The support for this proposition is mainly empirical, although cases can be cited of underdeveloped countries having low productivity functions of capital. For example, in periods of political instability it can happen that the marginal productivity functions of all factors of production taken separately, hence also the combined marginal productivity function, are low. Moreover, the productivity of capital depends not only on the amount of capital employed, but also on a large number of other factors such as labour attitudes, entrepreneurial ability, the economic age of a country, the degree of technology associated with capital investment, etc.

Some economists employ capital-output ratios to classify economies as developed and underdeveloped. In developed countries the range of capital-output ratio is believed to lie between 2.9:1 and 4:1. Philip Redfern's estimate for the United Kingdom reveals this ratio to be 2.9:1 for the year 1952.[2] For the United States this ratio has been estimated variously. Thus for the period 1939–55, while on Simon Kuznets's estimates this ratio works out at 4.4:1, the Department of Commerce places the ratio at 3.7:1.[3] Japan's capital-output ratio for the year 1955 is estimated as 2.46:1.[4] In underdeveloped countries this ratio may be supposed to lie between 1.5:1 and 2:1.

[1] *Ibid.*, p. 160.

[2] Philip Redfern, 'Net Investment in Fixed Assets in the United Kingdom 1938–53', *J.R.S.S.*, Vol. 118, Part 2, 1955, pp. 141–92; see especially Table 11, p. 164.

[3] Evsey D. Domar, 'The Capital-Output Ratio in the United States: Its Variation and Stability', in *The Theory of Capital* (1961), edited by F. A. Lutz and D. C. Hague, pp. 95–117; see especially Table 5, p. 101.

[4] H. Massaki, 'On Capital-Output Ratios by Industry', *I.E.R.*, February 1960, pp. 41–53; see especially p. 46.

The Indian sources place this ratio for the period 1951–56 at 1.8:1.[1] The Indian estimate is necessarily rough as no detailed study of investment in fixed assets has so far been made. No such estimates are available for underdeveloped countries that approximate the Indian conditions, such as Burma, Ceylon, Egypt and Pakistan.

2. Another criterion that is often used to classify countries as developed and underdeveloped is man-land ratio. It is remarkable that in literature on economic development both high and low man-land ratio has been used as an index of underdevelopment. The high man-land ratio emphasizes pressure of population on land resources, such as is the case in Ceylon, China, India and Pakistan. While over-population may be a major cause of underdevelopment in some countries, it does not explain why other countries that are not over-populated should similarly be underdeveloped. The low man-land ratio signifies underdevelopment by pointing to 'empty' tracts of land that are available in a country. This may be true of many underdeveloped countries in Latin America and Africa. As both high and low man-land ratio cannot at the same time act as the indicator of underdevelopment, this criterion may be regarded as ambiguous.

3. In the third place, underdevelopment may be indicated by the ratio of industrial output to total output (or of industrial population to total population). This ratio is supposed to increase as *per capita* income in a country increases. Theory gives only qualified support to this proposition. The degree of industrialization is a consequence rather than a cause of economic development. Objections to the use of the ratio of industrial to total income have been raised, among others, by Professor Viner who argues as follows:

'. . . where agriculture is prosperous not only do tertiary or service industries tend spontaneously to grow, but there is widespread tendency to use disposable surplus income derived from agricultural prosperity to subsidize uneconomic urban industry, with the consequence that the overall level of *per capita* income, while still comparatively high, is lower than it would be if urban industry were not artificially stimulated.

I do not challenge the semantic sovereignty of economists or of anyone else, and if there is determination to continue to use 'under-development' and 'non-industrialization' as synonymous terms, I must reconcile myself to the fact even if I do not approve of it. What I do have a right and a professional duty to insist upon, however, is that the practice is either arbitrary, or is more or less conscious question-begging, having as its consequence, and sometimes its

[1] Government of India, *First Five Year Plan*, 1952, pp. 32–33; and *Second Five Year Plan*, 1956, pp. 9–11.

deliberate intention, the evasion of analysis which would lead to unwelcome conclusions.'[1]

As an empirical proposition however, the ratio of industrial to total output passes as a valid criterion of underdevelopment. Studies on patterns of industrial growth conducted by some American and British economists (notably, Bean, Clark, Chenery, Kuznets, Rosenstein-Rodan and Rostow[2]) confirm the positive correlation between *per capita* income and the ratio of industrial to total income. This is due to secular change in the composition of demand for agricultural products of which the decline in demand for food, known as Engel's ratio, is the most important single factor. That Engel's Law (formulated in 1857) is universally valid has been repeatedly proved by econometricians. Its latest confirmation comes in Professor Houthakker's studies.[3] Applying regression analyses of about forty surveys in thirty-three countries Houthakker arrived at the conclusion that partial elasticities for food, clothing and housing in these countries were similar though not equal.

4. Lastly, countries may be classified on the basis of *per capita* income. Although comparisons based on national income are not free from ambiguities yet the criterion of *per capita* income seems to work very well. The following table (page 86) gives estimates of *per capita* product of fifty-five countries expressed in US dollars. As will be noticed, the cluster of countries at the bottom corresponds to what economists loosely regard as underdeveloped countries.

It may be apt to point out here that the national income of countries with low *per capita* income tends to have a low bias in comparison with the income of countries with high *per capita* income if that comparison is made, as is usual, by converting incomes in local currencies to a common monetary unit through the foreign exchange rate. These biases are of two kinds: (*a*) those associated with the

[1] *International Trade and Economic Development* (1953), p. 97.

[2] L. H. Bean, 'International Industrialization and Per Capita Income', '*Studies in Income and Wealth*', Vol. 8, N.B.E.R., New York, 1946; C. Clark, *The Conditions of Economic Progress*, 3rd ed., 1957; H. B. Chenery, 'Patterns of Industrial Growth', *A.E.R.*, September 1960, pp. 624–53; S. Kuznets, 'Quantitative Aspects of the Economic Growth of Nations, II, Industrial Distribution of National Product and Labor Force', *E.D. & C.C.*, July 1957; P. N. Rosenstein-Rodan, 'Problems of Industrialization of Eastern and South-Eastern Europe', *E.J.*, June-September 1943, pp. 205–16; and W. W. Rostow, 'The Take-Off into Self-Sustained Growth', *E.J.*, March 1956, pp. 25–48.

Also see W. G. Hoffmann, *The Growth of Industrial Economics*, translated from the German into English by W. O. Henderson and W. H. Chaloner, 1958.

[3] H. S. Houthakker, 'An International Comparison of Household Expenditure Patterns', 'Commemorating the Centenary of Engel's Law', *Econometrica*, October 1957, pp. 532–51; see especially Table II, pp. 541–2.

volume of and (*b*) those associated with the prices of goods.

One source of volume bias is the failure of income statements in some underdeveloped countries (e.g. Thailand) to include home-self-)consumption in income. Volume biases can also be associated with the cost of production in industrial societies[1] which tends to get recorded as income. For example, the cost of transportation to and from work in cities, some urban rents, the cost of distribution of many products are personal expenditures in an industrial society. These would be superfluous in a more traditional society.[2]

ESTIMATE OF PER CAPITA PRODUCT EXPRESSED IN US DOLLARS
ANNUAL AVERAGE 1952–54

AFRICA		*AMERICA*		*ASIA*		*EUROPE*		*OCEANIA*	
Country	*Per Capita*	*Country*	*Per Capita*	*Country*	*Per Capita*	*Country*	*Per Capita*	*Country*	*Per Capita*
Range in US Dollars:									
(*a*) *Over 1,000*									
		US	1,870			Switzerland	1,010		
		Canada	1,310						
(*b*) *750 to 1,000*									
						Sweden	950	N. Zealand	1,000
						Luxembourg	890	Australia	950
						Belgium	800		
						UK	780		
						Iceland	780		
						Denmark	750		
(*c*) *500 to 749*									
		*Venezuela	540			France	740		
						Norway	740		
						Finland	670		
						Germany	510		
						Netherlands	500		
(*d*) *250 to 499*									
Union of South Africa	300	Argentina	460	Israel	470	Ireland	410		
		Puerto Rico	430	*Malaya	310	Austria	370		
		Chile	360	Lebanon	260	Italy	310		
		Cuba	310						
		Colombia	250						
		Panama	250						
(*e*) *Under 250*									
Egypt	120	Brazil	230	Turkey	210	Greece	220		
Rhodesia and Nyasaland	100	Mexico	220	Japan	190	Portugal	200		
		†Jamaica	180	Philippines	150				
Belgian Congo	70	Dominican Republic	160	Ceylon	110				
Kenya	60	Guatemala	160	*Thailand	80				
Uganda	50	Ecuador	150	Korea	70				
		Honduras	150	Pakistan	70				
		Paraguay	140	India	60				
		Peru	120	Burma	50				

* 1952 and 1953. † 1952.

Source: UN, 'Per Capita National Product of Fifty-five countries', 1952–54, 'Statistical Papers', Series E, No. 4 (1957).

[1], [2] Expressions 'industrial' and 'traditional' may be taken to mean here (roughly) 'developed' and 'underdeveloped' respectively.

The process of international trade tends to give a low bias to costs of services and food products in traditional societies. The prices of goods and services tend to be lower in underdeveloped countries than one would expect by correcting their prices in developed countries through the foreign exchange rate.[1]

Jacob Viner has recently suggested an indicator of underdevelopment, according to which a country is underdeveloped if it has 'good potential prospects' for increasing '*per capita* incomes' or supporting 'an existing high level of *per capita* income for increased population'.[2] This definition emphasizes what is after all crucial in the phenomenon of development, namely, *per capita* real income and development potential. But it can be applied universally both to underdeveloped and developed countries. The Indian 'Plans' incorporate the following definition of underdevelopment:

'An underdeveloped economy is characterized by the coexistence, in greater or less degree, of unutilized or underutilized manpower on the one hand and of unexploited natural resources on the other. This state of affairs may be due to stagnancy of techniques or to certain inhibiting socio-economic factors . . .'[3]

Taking the general economic situation in most underdeveloped countries into account, it appears that the following two negative specifications hold universally: (*a*) scarcity of stock of capital goods and productive equipment available within the economy; and (*b*) relative backwardness of techniques of production. In consequence, the total labour force existing in the economy cannot be gainfully employed and *per capita* incomes tend to be low. The practice in most socialist countries is to regard the ratio between total employment (N) and total labour force available (N_0), i.e. N/N_0, as a measure of degree of underdevelopment.[4] Of course, this measure must be adjusted to account for cyclical variations in employment; this will

[1] Dan Usher, 'National Income of Underdeveloped Countries', Seminar paper read at the Manchester University, February 25, 1962. The paper is under publication.

[2] *Op. cit.*, p. 98.

[3] *First Five Year Plan*, p. 7.

[4] N is further equal to $\frac{c}{\alpha w}$, where c is the value of the economy's stock of capital goods, w the average wage rate, $\alpha(=\frac{c}{v})$ the average degree of capital intensity (what Marx called the organic composition of capital), and $v(=Nw)$ the value of the total labour employed. (See O. Lange, *Essays on Economic Planning*, 1960, p. 33.) In the absence of productivity changing through innovation, capital-intensity, capital-output and capital-labour ratios move together; that is why they are sometimes identified with one another.

eliminate the possibility of a developed country having temporarily a low N/N_0 ratio due to the phenomenon of Keynesian underemployment.

IV

Historically, most underdeveloped countries are, at the moment, in transition from the 'pre-industrial' to the 'industrial' stage. The phenomenon which is common to most underdeveloped countries is a sort of economic dualism: alongside a large sector of the economy, where agricultural and industrial forms of enterprise are carried on in the traditional way on a small scale with the help of family and artisan labour using primitive techniques and simple tools of production, will be found a (small) highly developed and organized sector characterized by large-scale operations using capital on a fairly intensive scale employing modern techniques of production and based on the system of hired labour. As a consequence of this situation, *per capita* income levels are very low in the primitive sector and almost the entire population dependent on this sector is living at the margin of biological subsistence. Relative to the primitive sector the differential in the *per capita* earnings in the advanced ('capitalistic') sector may be fairly large, though in the economies where the pressure of population is acute, the *per capita* income levels may not be above the subsistence level even in the advanced sector.[1] This is because the availability of a large labour force in the economy tends to lower the productivity of labour by reducing the degree of 'capital intensity' (of production). Thus underdevelopment carries with it the implication that the productivity of the labour force in the economy is low, hence the resulting *per capita* real income is low.

The key to the dynamic force in an underdeveloped country lies in its economic policy. This study is based on the assumption that the country follows an active economic policy under the aegis of a sympathetic government through *planning* or some other form of active governmental direction of the economy. This assumption seems to be fulfilled in many underdeveloped countries, especially those of the type with which we are particularly concerned, such as, Burma, Ceylon, Egypt, India and Pakistan.

The two principal objectives which the growth processes in underdeveloped countries may often consciously pursue are (1) higher levels of *per capita* income and (2) full employment of the available labour force. There are other considerations; e.g. equitable distribu-

[1] Most underdeveloped countries seem to fall into this category at the present stage of their economic development.

tion of income, economic and social security, higher levels of education, better conditions of work, etc. But to a large extent they constitute a subsidiary set of economic objectives. This at least has to be the case for a considerable period of time once the economy starts rising from lower levels of income-formation. However, in the context of underdeveloped economies the two principal objectives of growth policy, namely, 'higher levels of *per capita* income' and 'full employment' are not completely compatible with each other in the initial periods. The reason for this is the scarcity of capital. As wage rates cannot be pushed below the minimum which is dictated by the biological and sociological requirements of subsistence,[1] full employment is possible only by reducing the capital intensity. This brings the economy down to very low levels of productivity giving very low *per capita* income.

The alternative of adopting the capital-intensive methods of production, based on more advanced techniques, hastens the growth of the National Product through a rapid rise in productivity but this approach has a serious drawback. It leaves the economy in a state of unemployment and/or underemployment of part of the labour force for a considerable period of time. This, besides placing the stability of the economy in jeopardy, implies continuing waste of human resources. The problem is not insoluble in theory. We can always postulate a rate of capital accumulation which is sufficiently high to permit full employment of the available labour force with a value of capital intensity appropriate to the latest techniques of production. However, it is questionable if any underdeveloped country has the potential to realize in practice the desired rate of capital accumulation (even assuming generous foreign aid). The empirical evidence from underdeveloped economies suggests that the authorities usually plan for a compromise rate of transformation, adopting capital-intensive techniques where new capacity is being created (including expansion of the already existing industry) and leaving the remainder of the economy to be taken care of by forces of historic metamorphosis working gradually from capital-extensive to capital-intensive techniques of production.

The relationship between growth, savings and productivity of capital is clearly brought out in the growth equations developed by R. F. Harrod and E. D. Domar.[2] Thus according to Harrod's version, if G stands for growth, C for capital coefficient and s for savings ratio, then

[1] 'Cost of production' of the labour force, in the Marxian sense.

[2] R. F. Harrod, *Towards a Dynamic Economics* (1954); see especially p. 77 and E. D. Domar, *Essays in the Theory of Economic Growth* (1957), Chapters III and IV; see especially p. 97.

$$GC=s$$

A similar approach has been used by Domar. The rate of growth, r, in his theory is

$$r=\alpha\sigma$$

where α is the propensity to save and σ represents 'the *potential social average investment productivity*'. Domar represents 'the ratio of the productive capacity net of depreciation (net value added) of the new projects to capital invested in them (I)' by $s \cdot \sigma$, as defined above, is different from s as 'the productive capacity of the whole economy may increase by a smaller amount, because the operations of these new projects may involve a transfer of labour (and other factors) from other plants whose productive capacity is therefore reduced'.[1]

From the above equations we can read off that given the value of capital-output ratio, the rate of growth of national income is positively correlated to the rate of saving.

V

The centrepiece of economic activity in the underdeveloped countries is, then, capital accumulation. The economic base of capital accumulation lies in the (positive) difference between what the economy produces (National Product) and what it needs to maintain the existing labour force, known as 'economic surplus'. In an underdeveloped economy this economic surplus is bound to be small. Income is the source of saving and as income *per capita* is low, voluntary saving *per capita* will also tend to be low. It therefore follows that the rate of domestic accumulation in an underdeveloped economy will tend to be low. In consequence, an underdeveloped country must explore the possibilities of external aid. External aid has two main functions in an underdeveloped economy. First, it supplements the scarce investible resources of the economy. Second, as balance of payments difficulties are bound to arise in the early stages of development, due largely to the fact that underdeveloped countries are not likely to have sufficient exports to buy their capital equipment requirements from industrialized countries, external aid makes available the much-needed foreign exchange.

Owing to insufficiency of private capital and small size of the market (in relation to the economies of scale) in many industries, the rate of capital accumulation in the economy cannot be improved significantly through private investment. This means that if rapid accumulation of capital has to take place, the rate of public investment in the economy must increase absolutely and relatively. In most underdeveloped countries public investment is being financed

[1] *Essays in the Theory of Economic Growth*, pp. 73–4.

by means of increased taxation, public borrowings and deficit financing.[1] So that economic development can take place on the basis of planned public investment, an underdeveloped country is likely to create a large public sector. This sector has a strategic role to play in capital accumulation and economic development. On the one hand, the earnings of public enterprises, which generally include profit and turnover tax, are an important development resource. On the other, the nationalized sector offers a ready field for new public investment through expansion of its existing enterprises and the creation of new ones.

Recent empirical studies on patterns of industrial growth provide ample evidence that the industrial growth in underdeveloped countries, unless directed otherwise, has a strong bias towards consumer goods' industries. The following table based on basic data relating to a mix of fifty-one developed and underdeveloped countries brings out this fact clearly.

INCREASE OF MANUFACTURING OUTPUT WITH INCOME

Industry	*Normal* Output at Per Capita Income* (£)		
	100	300	600
Group A			
Investment and Related Products	12.0%	23.6%	34.5%
Group B			
Intermediate Goods	19.7%	22.3%	22.6%
Group C			
Consumer Goods	68.3%	54.0%	42.9%

*'Normal' refers to the value (of output) as computed from the regression equations—Chenery's Table 2, p. 633—based on the basic data of the fifty-one developed and underdeveloped countries previously mentioned (as listed in Chenery's Table 1, p. 632).
Source: H. B. Chenery, *Patterns of Industrial Growth, loc. cit.*, p. 638 (Table 5).

It will be noticed that as shifts to higher national output take place the share of investment goods increases and the share of consumer goods decreases. The share of intermediate goods remains more or less steady. Variations in the relative rates of growth are due largely to the preponderance of economies of scale relative to the size of the market in Groups A and B. Professor Chenery's analysis accounts for nearly 70 per cent of the total deviation from proportional

[1] The term 'deficit financing' or 'deficit budgeting' refers to the state financing the excess of its expenditure over income through the 'creation of money'. This usually takes the form of borrowing from the Central Bank or running down of accumulated balances. The term deficit denotes deficit both on revenue and on capital account.

growth rates to this factor alone. Of the two main factors that affect the size of market, namely, income and population, the influence of income has been more marked.

That in private enterprise economies consumer goods industries have a tendency to dominate in the earlier stages of industrialization should be further clear from the following historical data.

CONSUMER- AND CAPITAL-GOODS INDUSTRIES IN THE EARLIER STAGES OF INDUSTRIALIZATION (ALL INDUSTRY=100)

		Net output of Manufacturing Industries			
Country (1)	*Year* (2)	*Consumer-goods industries* (3)	*Capital-goods industries* (4)	*Excluded Industries** (5)	*Net Output ratio between (3) and (4)* (6)
A. Some Recently Industrialized Countries, 1906–48					
1. Brazil	1919	70.0	11.3	18.7	6.2
2. Chile	1912	58.4	11.1	30.5	5.2
	1925	60.2	12.3	27.5	4.9
3. Mexico	1940	75.8	14.5	9.7	5.2
4. Argentina	1908	62.7	13.3	14.0	4.7
5. India	1925	48.6	11.6	39.8	4.2
6. New Zealand	1906	53.6	9.7	36.7	5.5
	1916	59.4	12.4	28.2	4.8
	1924	45.8	13.6	40.6	3.4
B. Some Industrialized Countries, 1841–1900					
1. Belgium	1846	80.2	15.5	4.3	5.2
2. Great Britain	1851	51.0	11.4	37.6	4.7
	1871	51.7	14.0	34.3	3.9
3. France	1861–65	64.6	14.5	10.9	4.5
4. Switzerland	1882	61.6	15.6	22.8	4.0
5. Japan	1900	59.3	12.4	28.3	4.8

*Such as gas, electricity, building, quarrying, paper and printing. Hoffmann excludes these industries in his study as these cannot be classified as either consumer-goods industries or capital-goods industries.
Source: W. G. Hoffmann, *The Growth of Industrial Economies*, 1958, Ch. IV.

Thus if rapid economic development has to be initiated under the auspices of the State, the creation of an effective nationalized sector, comprising mainly the producer goods industries, is frequently an essential prerequisite.[1]

In most socialist countries where the economic system is in transition from capitalism to socialism, the economy will be found to divide itself into three sectors:

[1] Depending on the strategy deployed, the creation of the nationalized sector can lead in the direction either of socialism or of state-capitalism.

(1) The socialist sector, comprising nationalized and co-operative enterprises.
(2) The capitalist sector, based on the private ownership of the means of production and characterized by hired labour and large-scale operations carried on with the help of modern techniques of production. As the transition period closes, this sector plays a comparatively small role in the economy. A notable exception at present is the German Democratic Republic where the capitalist sector continues to be predominant both in industry and trade. In China the capitalist sector has been dovetailed to the socialist sector and is being transformed through the development of the 'state-capitalist' enterprises which are owned and controlled jointly by the state and private capitalists.[1]
(3) The small-scale private commodity producers' sector, comprising small peasants and craftsmen who own their own means of production and who work with the labour supplied by their own families.

Taking a realistic view of the circumstances of underdeveloped countries it can be asserted that the strategy of development in these countries must emphasize the development of the public sector as the main driving force of the economy. As this sector grows faster than the two private sectors, the latter will have only vestigal significance near the end of the period of transition. But the order of growth necessary to enable most (if not all) of the underdeveloped countries to move out of the trough of underdevelopment is so colossal that this period is bound to be very long. And it is to serve this period of transition that economic theory must be oriented if it has to serve some useful purpose. This enquiry orients the Law of Demand, which has been set out critically in the first four chapters, to the situations of an underdeveloped economy that is in transition from capitalism to socialism to ascertain to what extent the formulation of the law remains realistic in such a set-up and whether therefore the law is serviceable or not.

There is yet one more important factor to which attention must be

[1] The Chinese growth policy aims at a gradual swallowing up of the capitalist sector by the socialist sector. This policy was preferred to the alternative of outright liquidation of the capitalist sector in view of the historical fact that the Chinese capitalists supported the 'national liberation movement'.

In the Soviet Union and in 'People's Democracies' in Central and Eastern Europe the capitalist sectors were liquidated more or less abruptly as soon as the communist forms of government were established. This essay works on the assumption that the three sectors herein described will characterize the organization of the economy to which it is related. In view of the existing historical trends this assumption seems quite valid.

drawn here. It is the question of the treatment of international trade in an underdeveloped economy. As we are proceeding on the assumption of planned economic growth, it should be clear that for planning to be effective some sort of national control of international trade is a necessary condition.[1] The most important single reason for controlling international trade is the insulation of the national economy from the shocks of trade fluctuations in the outside world. In countries, socialist as well as non-socialist (e.g. mixed economies like India and Pakistan), where the technique of planning has been established as the main instrument of economic transformation, exports are only the means to buy imports necessary for the realization of plans. In all such cases, therefore, the national economic plan must take into account the implications of international trade and make appropriate provision for them.

VI

The above sketch calls attention to certain general peculiarities of an underdeveloped economy. It was postulated that the economic policy of such an economy is in the hands of a sympathetic government. Planning was then introduced as the commonest form of governmental direction of growth processes. 'Full employment' and 'high *per capita* income' were mentioned as the principal long-term objectives of the growth policy in an underdeveloped country. It was stated that in view of the scarcity of capital goods and land resources the economy will continue to have a backlog of unemployed labour in the economy for a considerable period of time. As the accumulation of capital was singled out as the most potent single factor of growth, it follows that for such an accumulation to take place at a growing rate, *per capita* real incomes cannot grow except marginally. The incremental national income must be continually ploughed back as new investment. This means that the consumer goods sector will grow relatively to the producer goods sector. We then proceeded to argue that the establishment of a strong public sector will emerge as the backbone and the chief driving force of the economy. This will be true whether the economy eventually remains a mixed type, with a relatively smaller private sector co-existing, or is transformed completely from capitalistic to socialistic forms of production.

[1] With the exception of China, where strict controls operate, all the socialist countries have nationalized international trade.

Chapter 6

THE FUNCTIONS OF DEMAND IN A PLANNED MIXED ECONOMY

The economic model which we outlined in the last chapter has three main features. Firstly, it is a mixed economy with public and private enterprises coexisting. Secondly, it is a transitional regime working its way from 'capitalistic' to 'socialistic' or 'semi-socialistic' forms of production. Thirdly, planning is its major instrument of transformation. In this chapter we hope to show that, whatever views one might hold about 'coefficients of economic choice' in a socialist economy, the logic of demand has a definite and positive functional role to play in a planned mixed economy. In order to show this it will be useful, first, to look upon the role of demand in a free enterprise system. We can then substitute the planned mixed economy in place of the free enterprise economy and follow through all the implications resulting from this substitution.

II

In a system based on free enterprise, the consumer demand serves two main purposes:

1. It provides data concerning the preferences of the citizens as to how they like the community's resources to be used. Consumers acting as buyers of a commodity determine the extent of demand for that commodity. Given supply conditions the extent of demand settles the price of a particular commodity. Relative differences in prices then embody relative consumer preference-intensities. By paying a price for any commodity consumers reveal a choice for that commodity as compared with other commodities which could have been bought instead with the same amount of purchasing power. At the same time, the prices reflect, on the supply side, relative scarcities. In consequence the price parameters can be taken as indicators of opportunity costs and show the direction in which it is most profitable to steer productive resources that have alternative uses.

As the private enterprise system is based on profit, the production of goods in such a system takes place with reference to anticipated demand. In this way consumers' valuations provide an economic calculus to guide production so as to secure allocation of the economy's resources in accordance with the wishes of the citizens.

2. In the free enterprise system the economy's given output of goods gets distributed in accordance with the demand prices. Postulating that the initial distribution of income and capital in the community is 'fair and reasonable', the free market provides the mechanism for the most equitable distribution of the goods produced. Such a system responds faithfully to the demand prices and it can be bettered only by changing the given configuration of the purchasing power in the hands of the buyers.

There are, however, some important lacunae in the free market criterion. In the first place, it can apply only to a given universe of goods. There are no demand prices for the goods which do not yet exist but may come into being in the future. In the second place, production in the free enterprise system is based on anticipated demand. There is no automatic mechanism which can make the production decisions taken by producers conform to the requirements of the consumers. In the third place, the free market criterion can apply to the production and distribution only of private goods. Public goods, such as education, roads, health services, assistance for the infirm, defence, and so on, have no individual demand prices and their production and use in modern societies is generally planned collectively by the State. As Robbins has observed, 'Even in the profoundest times of peace and in the most *laissez-faire* of free economies there is an important group of goods, the so-called public goods, which are chosen another way.'[1] Last though not least, as tastes and needs of consumers vary, any given set of prices can be objected to on the grounds that it is advantageous to some and disadvantageous to others. With these remarks we put to ourselves the question: to what extent is the criterion of consumers' valuations logical in the setting of a planned economy?

III

We may rule out at the outset two issues which are important but do not strictly fall within the scope of our analysis. Firstly, we do not intend to investigate the political conditions necessary for the success of planning in a mixed economy. These conditions depend on the special historical circumstances of a country and are theoretically indeterminate. Secondly, we are concerned with the 'primary plan-

[1] L. Robbins, *The Economic Problem in Peace and War* (1947), p. 11.

ning' only; that is, with the allocation of productive resources among different uses and the distribution of outputs among different individuals. We do not touch on the 'secondary planning' which is concerned with the 'instruments and processes' through which the government's primary plans are to be implemented.

To judge the criterion of demand as a mechanism for the allocation of resources and the distribution of outputs in a planned mixed economy, we shall have to bring out, first, its uses and, then, its limitations. If we bear in mind the picture of the planned mixed economy as was sketched out in the last chapter we shall discover that the criterion of demand has several important uses in such a system.

(*a*) In the first place, we are dealing with underdeveloped economies. It is a hard fact that these economies have scarcely enough statistics on which to base a sound economic policy. Collection and organization of statistical material requires technical skill, equipment and material resources. It will take time for these countries to make up this deficiency. Meanwhile the planner must have something on which to base his decisions on the question of the 'what' and 'how' of production. The statistics which are likely to be available or can be conveniently obtained from the market without much expenditure of time and money are the price statistics. These statistics provide the planner with the necessary coefficients of consumer choice, for prices measure coefficients of choice in terms of units of money. Our argument to be valid assumes that the planner is compelled to know consumer preferences; in other words, the planner's preference schedules derive from the consumer's preference schedules. It is not suggested that the planner ought to accept the consumer's choice. The consumer may like to have more beer and less milk; the planner may wish to reverse that preference. The consumer may like to use up his income on current consumption; the planner may deny him that opportunity. But unless the planner knows what the consumer's preferences are, how is he going to make up his mind about which of them are reasonable? The underlying principle is that once the consumer's share in the community's total resources is settled and his wants pruned of 'irrationality', the production of consumer goods should be designed in a manner that secures the maximum fulfilment of his wants. The evolution of demand is continuous and it is only through price coefficients that the members of a society have any opportunity to express their day-to-day preferences. Planning without the requisite coefficients of choice is bound to be arbitrary, based upon intuition and guesswork. This can prove to be disastrous for underdeveloped countries for two reasons. Firstly, underdeveloped countries are not likely to have

large stocks of goods to meet their current deficits. Secondly, as was stated in the last chapter, the demand of the capital goods' sector for the resources of the economy is likely to be such as to leave the economy at a level of marginal subsistence. Under these circumstances any errors of planning—and there are bound to be not a few if planning is on a trial-and-error basis—are likely to produce serious supply-demand disequilibria in various commodity markets.

(*b*) The influence of consumer demand has to be encountered by the planner in respect of the means of production as well. Planned mixed economies are different from, on the one hand, the free enterprise economies and, on the other, the socialist economies. The former have no planning, the latter have no 'markets'. In planned mixed economies both the public and the private enterprises buy productive services in the same market. While the private sector is certain to operate in the interests of the consumer, the public sector must also take into account the prices it has to pay for productive services and the prices at which it can dispose of its output of goods.

(*c*) The economists in the socialist countries have generally believed that questions, such as those raised above, bearing on rational production are relevant only during the earlier phases of planning. This belief arises out of the view that scarcity somehow vanishes during periods of rapid economic growth and the allocational and distributional problems, normally worked out in the free enterprise economy by the price mechanism, become easier, relatively speaking. This manner of reasoning stands the logical sequence on its head. For in liberating itself from the limitations of scarcity, a society has already given itself a more serious problem, the problem of complexity. The stock of means of production and the range of possibilities of production have both widened. The range of consumer tastes has widened considerably. The allocational and distributional problems become more, not less, difficult. The degree of irrationality of economic decisions becomes a matter of concern more for a developing economy than for an economy where the means of production are scantier and the allocational tasks simpler.

The last argument already shows that, whatever the form of economic organization, consumer demand analysis provides an important dimension for rational economic allocation.

(*d*) It is perhaps necessary to emphasize here that the underdeveloped economies we are considering, although planned, are nevertheless different from socialist economies. As has been pointed out before,[1] all the socialist countries with the exception of China have nationalized their foreign trade. The practice in underdeveloped countries is to exercise a fairly strict national control on the volume

[1] See above, p. 94n.

and direction of foreign trade but the valuation processes are taken care of by the market mechanism.

In addition it is important to note that the volume of foreign trade in these countries is bound to be significant for reasons discussed before. Statistics of international trade[1] reveal that on an average the foreign trade of an underdeveloped country is 10 to 15 per cent of the total volume of her GNP. But the significance of the foreign trade in underdeveloped countries extends beyond these numerical frontiers. Taking a long-period perspective, development (especially where foreign loans are involved)[2] compels the economy to have an import surplus for some years which may be followed by an export surplus later. These imbalances in the foreign trade sector will no doubt have far-reaching repercussions on the entire economy. In order that the supply-demand relations in the foreign trade sector may respond favourably to the general economic plan of the country, the factors (subjective as well as objective) that affect the conditions of supply and demand have to be studied carefully by the planner.

(*e*) It was stated in the last chapter that the determining principle of growth policy in an underdeveloped economy is mobilization of internal resources for purposes of capital construction. In order to ensure that the economy's available surplus, to increase which every effort has to be made, is canalized into investment, consumption must be controlled. This can be done in two different ways. Firstly, the pricing policy may be so manipulated as to equate the aggregates of money purchasing power and prices in the consumer goods markets. The use of the turnover tax in socialist countries as a device to take care of price and income elasticities of demand for individual commodities can be regarded as a cardinal illustration of this method.[3] Alternatively, the economy may rely on the method of directly shaping the real purchasing power of every household through judicious taxes and subsidies. In a socialist economy use can be made of either of the two methods. But an underdeveloped economy of the type we are considering has to rely on both. This is due to the mixed character of the economy. which restricts the

[1] U.N., *Yearbook of International Trade Statistics 1960*; U.N., *Statistical Yearbook, 1960*; U.N., *Yearbook of National Accounts Statistics 1960*; and G.A.T.T., *International Trade 1960* (all published in 1961).

[2] It is important to remember that foreign aid is indispensable to underdeveloped countries. Even if enough national savings become available, these cannot be translated into the kind of capital necessary to permit an underdeveloped country to ensure her own growth (without reliance on foreign aid).

[3] In Soviet Russia the turnover tax wipes out nearly 40 per cent of the community's aggregate money incomes. (See (1) G. Grossman, *Value and Plan* (1960), Notes to Ch. I; and (2) A. Nove, *The Soviet Economy* (1961), Ch. 3.)

coverage of any single method to only part of the economy. On the one hand, the prices of outputs produced in the private sector cannot be directly controlled by the State. On the other, the fiscal method can be only partially effective. This is for two reasons. First, only a small number of citizens in underdeveloped countries pay direct taxes, so that the fiscal method to be effective has to rely largely on indirect taxes. Since the tastes and needs of different households vary, the proportion in which the indirect taxes will affect different households will remain uncertain. Moreover, the fiscal method involves a considerable time lag which reduces its effectiveness to steer resources in the desired channels, so that it has to be supplemented by direct economic controls of which the price control is the most general form.[1] Under these circumstances the study of the phenomena of consumer demand no doubt provides an important guiding light.

Having discussed the usefulness of the criterion of consumer valuations in a planned mixed economy, we turn now to the limitations to which this criterion is subject.

(*a*) First of all, a society that plans collectively is not likely to allow the demand prices to settle the allocation of the community's resources between the present consumption and accumulation for the future. This decision has to be made, albeit arbitrarily, by political organs of the State. Human nature, being what it is, discounts the future. The planner, however, must plan from the point of view of an immortal society. As Professor Pigou reminds us, 'private self-interest is likely to favour consumption unduly as against investment. There are doors wide open here through which the State may claim, as good neighbour, to step in'.[2]

(*b*) Secondly, as has been pointed out before, some of consumers' choices exercised by means of demand prices may be considered by the planner as 'irrational', even erratic. He may like to correct them. For example, people may like to go to the cinema, the planner may instead send them to church. What is right or wrong involves an ethical judgment but there is bound to be some 'paternal interference' of this sort where resource allocation is controlled at the national level. In societies where the consumer is free to decide for himself, the State may seek 'to correct errors in people's choices' by suitable education. These two methods differ fundamentally in that, whereas the former implies the use of compulsion, the latter relies on persuasion and voluntary action. However, both are available to planned economies.

[1] The fiscal method in most cases will be found acting through the price mechanism.

[2] A. C. Pigou, 'Central Planning and Professor Robbins', *Economica*, 1948, p. 20.

Professor Robbins objects to both (*a*) and (*b*) above. Objecting to (*a*) he says, 'I acknowledge some obligation to posterity but not necessarily all that.' He does not think that 'it is usually a good thing to force upon the different members of the community, through the apparatus of politics, a rate of accumulation fundamentally out of relation to their true preferences formulated individually'.[1] His objections to (*b*) are of a different nature. He does not deny that 'bad results may follow from the ignorance of consumers' although he thinks that the appropriate remedy is eradication of ignorance through 'education', 'proper labelling of bottles', 'public tests of quality and safety', and so on. However, he thinks that the crux of the whole matter lies in being able to discriminate between choices which are 'the victim of technical ignorance' and those which are not. He himself has great fears that a collectivist State will always overdo its paternalism.[2] We may break away at this point, as a further analysis of the problem involves consideration of political theories of State action which transcend the bounds of economic analysis.

(*c*) In the third place, apart from public goods, to which we have already alluded, there are certain goods for which the consumer demand cannot be expressed through the market. This can happen, for example, when the consumer demand is insufficient to constitute a profitable market; perhaps the number of consumers is small; alternatively they may have inadequate purchasing power. Again, there is always the possibility of new goods for which the market has so far not had the opportunity to express a demand. In cases, such as these, where we lack the arbitrament of the market, the authorities must make up their mind, using their own judgment. But as Joan Robinson has warned, 'it is important to draw a sharp distinction between cases where it is essentially impossible for the needs and desires of the public to be clearly expressed through the market, and cases where the authorities decide to override market demand because it is held that the public do not know what is good for them . . . The fact that in some cases consumers' desires cannot be expressed purely by the market, does not mean that the authorities should impose their own views on consumers. It only means that they have to supplement the indications given in the market by other evidence to find out what the public prefers.'[3]

(*d*) Lastly, it has been argued by some socialist economists that the distribution of given outputs in accordance with the demand prices discriminates against the poor in favour of the rich. If this is so, then

[1] *Op. cit.*, p. 26.
[2] *Op. cit.*, p. 17.
[3] *Exercises in Economic Analysis* (1960), p. 213.

the remedy lies, as we have pointed out before, in reshaping the distribution of money among consumers rather than disrupting the mechanism through which they express their choices. The underlying logic is this: once each individual is assigned his share of the community's resources, he should be allowed to decide for himself on what outputs his resources should be expended. The point is brought home tersely in one of Pigou's *obiter dicta*: 'No doubt, more economic satisfaction is yielded by a given volume of resources if it is engaged in producing potatoes for the poor rather than caviare for the rich; but, granted that it is to be engaged in producing something for the very rich, why not caviare, which they do want, rather than potatoes, which they don't?'[1]

IV

The logic behind price-guided production is one of rational allocation of resources. Most underdeveloped countries that have taken to central planning are likely to take their cue from the Soviet 'models'. This is not so much for the reason that the idea of planning originated in Soviet Russia as for the fact that the Soviet experience has been very successful. Yet the Soviet models have not relied in any way on the price-mechanism to tackle the problem of the 'economic optimum'.

To rid the abovementioned arguments of paradox the following two questions must be considered.

How did Soviet planning achieve such notable results in spite of its disregard of the mechanism which makes economic calculation possible? Has Soviet disposition of resources been rational?

The second part of the question may be answered first. The test adopted here is, once the basic decision about the division of resources between consumption and investment is made, are the resources set aside for consumption used to meet the wishes of the consumers? If not, the productive effort carries a degree of waste and misdirection of resources which is in direct proportion to the extent the planners' schedule of production deviates from that of consumers' preferences. To simplify exposition we assume that the production of 'new' goods and 'public' goods is zero.

Anyone who views Soviet planning since its inception in 1928 cannot fail to be struck by the fact that it has not made any use of the price calculus which is the basis of normal economic calculation in free enterprise economies. Instead, the Soviet planning consists of direct co-ordination of physical magnitudes, known as 'direct calculus'. Prices and costs in such a system are tools of aggregation

[1] *Loc. cit.*, p. 23.

rather than parameters of economic activity. They are completely neutral in respect of the plan and are not allowed to influence it directly or indirectly. They enter the plan as symbols to be made use of by the 'planifier' and 'executors' to balance the national economy in a purely physical sense. 'Value category' has no role to play. It is obvious that such a system can function only through a 'system of commands'. Soviet Russia is accordingly a sort of 'command economy'. Its functioning is based on a system of state promulgations. Its outstanding features are 'centralization' and 'bureaucratization'. Every plan gets broken down into small-period plans. Targets of resource allocation, work-norms and output, etc. are set in great detail at national level. The setting up of an administrative system that can perform the huge tasks of organization and coordination imposed by planning without market prices, an 'ideal-type bureaucracy' *à la* Max Weber,[1] is not inconceivable. It has been attempted over a period, with a large measure of success, in Soviet Russia. But as Professor Robbins argues:

'Our theories of state action usually imply, not merely infinite wisdom on the part of administrators, but also infinite time in which to use it. It is not until you have sat in the smoke-filled committee rooms working against time to get snap decisions from Ministers who, through no fault of their own, are otherwise occupied, that you realize sufficiently the limitations of these assumptions. Nor are the more fundamental of these limitations removable by improvements of organization. You may reform your system of ministerial committees. You may augment the number of their advisers. You may employ troops of investigators to ascertain the reactions of consumers. You may stretch the sympathetic imagination to the utmost to seek to provide, within the limits of your plan, the kind of variety which you conceive to be desirable. You may sincerely believe that the process as you work it is, in some sense, good for the people. But I cannot think that, if you are honest with yourself, you can believe that such a system involves, or can involve, such degree of freedom for the consumer to get what he wishes, such an active participation in the daily moulding of social life, as a system which is based upon demand prices.'[2]

It is obvious that in a system that does not make use of demand prices there must be a large element of arbitrariness. Such a system is bound to be susceptible to gross divergencies from the 'ideal distribution' of resources. Although Soviet authorities may have

[1] *The Theory of Social and Economic Organization*, translated from German into English by A. M. Henderson and T. Parsons (1947).

[2] *Op. cit.*, pp. 22–3.

succeeded, after three decades of planning experience, in narrowing down the area of misdirection of resources, the need for underdeveloped countries to follow the Russian example is not immediately apparent. Quite apart from the special political conditions, usually associated only with a totalitarian state, that would be needed to back up a top-heavy administration, the expenditure of time and resources would certainly be too onerous. The use of electronic computers on a large scale and in new applications would be necessary to bring the planner's process of approximation into line with the consumers' scales of priorities. In the absence of the market mechanism the clash between the planner's and consumers' preference schedules seems to be ineluctible. There is no automatic mechanism in Soviet planning that will spring into action to check the resulting misdirection of resources.

The first part of the question refers to the fact that the price mechanism provides an efficient economic calculus and leads to optimum resource allocation. Why any society should not accept this cardinal principle of optimization is not appreciated in Western economic theory. To understand 'economic growth', however, one has to probe behind the assumption of fixed resources of static theory and search for the factors that make the resources grow. Soviet economic thinking has been mainly taken up with the latter question. Through the exercise of direct control of the 'rate of investment' and 'technological progress', the Soviet authorities have been able to bring about a remarkably high rate of economic development. However, the Soviet approach only underlines the obvious: that 'economic efficiency' is a two-dimensional concept. While 'optimum utilization of available resources' provides one dimension, the other is 'optimum development of resources'. Western theory has emphasized the former, Soviet experience the latter. The optimization theorem must emphasize both. The literature on growth and planning readily reveals that while the Soviet rate of development as compared to the average rate of development in many of the non-socialist countries has been constantly much higher, Soviet planning experience has been by no means free from the pitfalls of misallocation of resources.

The argument of the above paragraphs can be translated in terms of a three-dimensional diagram (Fig. 21).

A given country can produce consumer goods C_1 and C_2 and investment good K capable of increasing future outputs of C_1 and C_2. The block RST represents the combinations of possible outputs. Capacity is fully utilized at points on its surface.

If the state decides, on considerations of a planning board rather than a public enquiry, to perform no investment, then the whole of

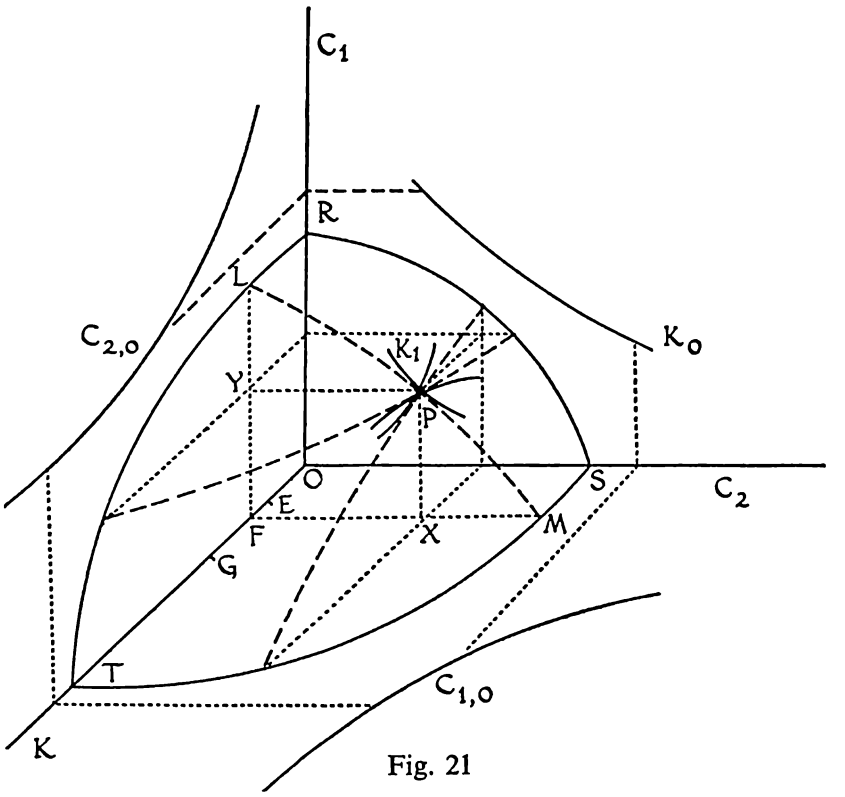

Fig. 21

production can go to consumption. The consumers will have a series of indifference curves, and these may be drawn in the plane OC_1C_2, representing no investment. A typical curve is K_0. It is possible that consumers would prefer always to have no investment, or at least to have little of it; but this decision is out of their hands. If the state decides to produce OF for investment, then the production possibilities, as far as the consumers go, are those on a curve in the plane FLM, and are bounded by LPM. Consumers may not be happy about this, but their choice is the restricted one of allocating the resources they are allowed to command between producing C_1 and C_2. Thus they have a family of indifference curves in the plane FLM, similar to those in OC_1C_2.

Any community may be prevailed upon to forgo some current consumption in favour of the future, and consequently even of their own free will, consumers may prefer to devote an amount OF to investment. If this is so, then there will be a curve such as K_1 representing the combinations of C_1 and C_2 which, along with OF, provide

as much satisfaction as the greater quantities shown on K_0 provide when there is no investment. By shifting F slowly along we may generate a family of curves, coming out of the paper, such that every point on every curve represents combinations of outputs of the three goods that provide identical satisfaction. There will be a three-dimensional surface corresponding to the two-dimensional curve of conventional analysis; and just as, in conventional analysis, the optimal point is where the indifference curve is tangential to the production block, so here the optimal point is where the indifference surface is tangential to the production surface. In the diagram we have shown this point by P. The relevant preference surface intersects the plane K=O (corresponding to no investment) in the curve K_0. This links points showing combinations of C_1 and C_2 that (along with no investment) are just as acceptable as the lesser quantities indicated by the curve K_1, going through P. This curve shows the quantities of C_1 and C_2 which, combined with OF of K, provide as much satisfaction as those combinations on K_0.

Now an 'optimal' process is one in which planners produce OF investment goods, FX of C_2 and FY of C_1 for then output is indicated by P, where the two surfaces touch. Investments OE or OG would enable output to reach a point (on the production surface) where some (lower) indifference surface would cut it. Maximum satisfaction of present consumers is attained at P. If present consumers can be persuaded to think more of the future prosperity of the country, and to think that that is related more to investment output than to consumer output, then the indifference surface shifts and P changes.

Planners, being long-term minded, should perhaps choose a point like E (or F or G) without paying attention to the consumers' indifference surface (which is short-term minded). Having thus settled their apportionment of resources between K and (C_1+C_2), they should then produce those quantities of C_1 and C_2 which coincide with the point where the section of the production block through E (or F or G) is tangential to the section of an indifference surface, but this surface is unlikely to be a surface that is tangential to the block. Given free will the consumers would decide on a different level of investment.

The second question concerns the lack of interest of the Soviet 'model-builders' in the law of value. This is not difficult to explain, for Soviet economic theory is fundamentally a derivative of Marxism. Intellectual commitment to the 'labour theory of value' hindered Soviet planners from developing a concept of allocative efficiency. They argued that the law of value, expressing the role of exchange relationships, applied only to 'commodities', whereas in a fully

planned economy the position is different. All goods are produced and transferred according to plan (without involving 'change of ownership'). Hence these goods are not 'commodities', as understood in the 'bourgeois' theory. It follows, they argued, that the law of value does not apply in a centrally planned economy. The apathy of Soviet economists towards Western economic theory during the immediate post-revolution years is forcefully brought out in a popular textbook, N. Bukharin's *Economics of the Transition Period* which appeared in 1920. Speaking of principles of economic science he write:

'Political Economy is a science . . . of the unorganized national economy. Only in a society where production has an anarchistic character, do laws of social life appear as "natural", "spontaneous" laws, independent of the will of individuals and groups, laws acting with the blind necessity of the law of gravity. Indeed, as soon as we deal with an organized national economy, all the basic "problems" of political economy, such as price, value, profit, etc. simply disappear. Here the relations between men are no longer expressed as "relations between things", for here the economy is regulated not by the blind forces of the market and competition, but by the consciously carried out plan . . . The end of capitalist and commodity society signifies the end of political economy.'[1]

The teaching of 'political economy' was discontinued in educational institutions and no textbook of economics appeared between 1928 and 1954.[2] The 'liquidationist' trend during early years of Soviet planning was so marked that in 1931 the 'Central Statistical Office' was redesignated as the 'Central Office of National Economic Accounting'. The science of statistics dealing with 'the measurement of random, haphazard events' was thought to have no relevance in a planned economy where such events were thought to have been done away with.

V

The first attempt to arrest the liquidationist drift was made in 1943

[1] A. Kaufman, 'The Origin of the Political Economy of Socialism', *Soviet Studies*, January 1953, pp. 273ff. Also see *Marxism and Modern Thought* by N. I. Bukharin and others, translated from Russian into English by Ralph Fox (1935); especially pp. 46–65.

[2] The last economic treatise before 1953 was *An Outline of Political Economy* by L. Lapidus and K. Ostrovityanov, published in 1928; the first since then is L. Maizenberg's *Tsenoobrazovanie v narodnom khoziaistve SSSR* (*Price-fixing in the national economy of the USSR*), 1953; the first textbook to appear since Lapidus and Ostrovityanov's book is *Politicheskaya ekonomiya* (*Political Economy*), 1954, English translation by C. P. Dutt and Andrew Rothstein.

in an article attributed to Stalin.[1] The author argued that 'To deny the existence of economic laws under socialism means sliding down to vulgar voluntarism, which consists in the substitution of arbitrariness, accident, chaos, for the orderly process of development of production'.[2] The relevance of the law of value in a socialist economy was upheld in the case of goods where transactions involved 'change of ownership'; e.g. sales by co-operatives and peasants (to the state as well as to the citizens), sales by the state and co-operatives to the citizens, foreign trade, etc., etc. In all such cases, it was pointed out that the goods acquire characteristics of 'commodities' (*tovary*) in the Marxist sense. At the same time the author pointed out that the law was valid only in those sectors of the economy where it could affect the allocation of resources and had no meaning in the 'public sector' where production programmes are determined according to plan.[3] In substance, it meant that the law had a limited application in the consumer goods sector and did not apply to producer goods that fell almost wholly in the public sector. To quote the author (Stalin?): 'the problems of rational organization of productive forces . . . are not the subject of political economy, but the subject of economic policy of the directing organs'.[4] Stalin was, however, prepared to accord producer goods the property of 'commodity' when such goods entered international trade.[5]

Since Stalin's death there have been many new currents in Soviet economic thought. The year 1956 saw the beginning of a great intellectual debate on the 'role of the law of value in a socialist economy'. The debate opened at an academic conference at the Economics Institute of Moscow in December 1956. It was continued throughout the year 1957 until January 1958 when the fifth and the last conference was held at the Chair of Political Economy of Moscow University. The second, third and fourth conferences took place at the Economics Institute during 1957. A large number of papers and articles have been written on the subject since the debate first started. The controversy as to the validity of the law of value in socialist economies is still alive at the time of this writing. The majority opinion led by L. Gatovski, Ia. Kronrod and K. Ostrovityanov in Soviet Russia and M. Kalecki and O. Lange in Poland seems to centre round the proposition that adoption of a rational price rule is essential to guide resource allocation in general and investment choices in particular. However, the Marxist constraints on Soviet intellectuals are too formidable to permit an easy marriage of Soviet

[1] 'Certain Questions relating to the Teaching of Political Economy', *Pod znamenem marksizma* (*Under the banner of Marxism*), Nos. 7–8, 1943, pp. 56–78.
[2] *Ibid.*, p. 65. [3] *Ibid.*, p. 75. [4] *Ibid.*, p. 72.
[5] J. Stalin, *Economic Problems of Socialism in the U.S.S.R.* (1952), p. 59.

planning theory to the law of value which has 'capitalistic' origins. Although the controversy has not yet died, the debate appears to have bogged down on this doctrinal issue. Some of the important propositions that were advanced by the participants are set out below:

(i) Kronrod's attempt to deduce value under socialism led some economists to believe that it is demand 'which in the last instance gives goods their "value".'[1] To quote S. Kurowski, 'demand is the decisive factor in the last instance for shaping economic stimuli. Demand means consumers' tastes, desires, cravings, needs backed by purchasing power.'[2]

(ii) Although the majority seems to accept the view that the law of value applied to a socialist economy, the discussion as to the 'content' of the law is entangled in contradictions. V. Sobol' argued at the second conference that while 'commodity' production had ceased in socialist countries, the law of value continued to have operational significance for centrally planned economies. He was, however, of the view that the content of the law in a socialist economy was not the same as in a capitalistic economy.[3] Jan Drewnowski emphasized this point more clearly in an article in *Ekonomista*. He wrote thus:

'In the discussion which has been carried on . . . on the law of value in socialism, this law was never formulated in an explicit way. This may be explained only by the fact that the participants are of the opinion, that the formulation of the law, as given by Marx for capitalism is valid, without any changes for socialism. This view, however, must be considered erroneous. The law of value in capitalism is most closely connected with the working of the capitalist market, and first of all with the equalization of the rate of profit through the flow of capital between the branches of production. Such a mechanism does not exist in socialism, and therefore, the law of value in socialism must have another content than in capitalism.'[4]

(iii) I. Kozodoev, *the rapporteur* of the fifth conference, while accepting that producer goods have value rejected the view that they also have 'commodity' nature.[5] Some economists who were prepared to accept the price calculus contended that the law of value implied

[1] A. Zauberman in *Value and Plan*, edited by G. Grossman, p. 40n. For this and footnotes 2, 3, 5 belowand footnotes 1 to 3 on the next page, see notes to Zauberman's paper, *op. cit.*, pp. 40–6.

[2] *Zycie Gospodarcze*, 12, 1957, p. 4.

[3] *Voprosy Ekonomiki*, 8, 1957, p. 95.

[4] 'The Law of Value in Socialism: An Attempt at a Reformulation', *Ekonomista* 5, 1960, p. 1221.

[5] *Voprosy Ekonomiki*, 4, 1958, p. 110. See also *Problems of Economics*, October 1958, p. 59.

identity of price and value. They argued that 'economically unjustified deviations from value are harmful to the economy',[1] a weaker and negative proposition.

(iv) The discussion of the 'efficiency of capital investment' reveals that while many economists accepted the view that a price rule would foster rational economic calculation and secure economy in the use of resources (especially labour), some were of the opinion that value indices did not always provide adequate bases to judge the efficiency of capital. These economists would like to subordinate the theory of investment choices to the general theory of the 'plan-wise development of the national economy'.[2] Thus W. Brus warns that 'optimal solution of major investment problems can be obtained only . . . on the basis of central planner's preferences' and even 'the production of consumer goods where stimuli and signals coming from the market have to play the greatest part—cannot and should not in certain situations, be left to itself'.[3]

While Soviet economists are caught up in a dilemma, the Polish economists have given the socialist world a decisive lead. Led by Lange and Kalecki, both of whom are co-architects of Poland's 'New Economic Model' (in operation now),[4] they have introduced rational prices as the principal method of organizing production and distribution *in accordance with social preferences* and thereby securing the most effective utilization of available means of production. The Polish innovation is most marked in the sphere of international trade. Following the line of thought developed by Kalecki,[5] the prices of key raw materials are already being pegged to those in international markets.

Commenting on the role of prices in the New Model Lange argues as follows:

'The fixing of prices should be the basic means of linking socialist enterprises to one another, as well as of linking these enterprises to the consumers and private producers (peasants and artisans). *In other words these links should be based on the functioning of the law of value.* Under these circumstances the fixing of prices will provide an essential leverage in the management of the national economy.'[6] (Italics ours.)

[1] *Politicheskaya ekonomiya, uchebnik*, p. 552.
[2] *Ibid.*, p. 339.
[3] *Życie Gospodarcze*, 12, 1957, p. 4.
[4] Professor O. Lange is Chairman and Professor M. Kalecki a Deputy Chairman of the Economic Council of Poland.
[5] *Ekonomista*, 3, 1958, pp. 574–7.
[6] 'How Do We Conceive the Polish Economic Model?', *Documents and Discussions Series*, issued by the Polish Embassy, New Delhi, No. 1, April 1958, p. 2.

Many socialist economists who participated in the debate on the law of value admitted that serious contradictions can arise in a system that relies solely on 'direct calculus'. For example, the practice of paying premiums on overfulfilment of socialist plans cuts at the very roots of price neutrality postulated by these plans.

The Polish experience will no doubt be watched by the 'free' as well as by the 'mixed' and the 'socialist' world as a great turning point in history. It is interesting to note that some of the underdeveloped countries of the type we are considering in this study, such as India and Pakistan,[1] have been following, albeit unconsciously, the Polish rather than the Russian example.

[1] The growth models of these countries do not raise the question of optimum allocation, as developed in this chapter, at all.

Chapter 7

PREMISES OF DEMAND THEORY

In Chapter 6 we dealt with the role of the price mechanism in general and the consumer preference function in particular with reference to planned mixed economies. In this chapter we shift our orientation from elements of relevance to those of realism in the theory. We observed earlier that there exists widespread doubt in underdeveloped countries about the validity of a large body of the traditional economic theory. As Myrdal pointed out, this distrust is not ill-founded.[1] If the framework of assumptions on which the theory rests has become outworn the theory is obsolete. However, the course of events in the social sciences is different from that in the natural sciences. Whereas in the natural sciences warfare of ideas generally leads to a new theory supplanting the old, in the social sciences 'all doctrines live on persistently', the forces of metamorphosis working but gradually.[2]

II

From the point of view of applicability to underdeveloped economies, the premises of demand theory may be viewed as two distinct sets of assumptions, implicit and explicit.

The two most important assumptions which are implicit in all the variants of demand theory, elaborated earlier, are (*a*) abstraction of the theory from price controls and (*b*) its deduction solely from individual preference functions. Whether these two assumptions reduce the applicability of the theory to practical problems merits careful consideration.

(*a*) As has been argued in Chapter 5, the degree of economic disequilibrium is likely to be high in underdeveloped economies and

[1] See above, p. 82.

[2] K. Wicksell, 'Ends and Means in Economics' in *Selected Papers in Economic Theory*, edited with an introduction by Erik Lindahl (1958), pp. 51–66.

to correct it their authorities will inevitably impose certain remedial measures. Of the complex of measures open to them the one most commonly used in recent years is the control of prices.

Although the majority of economists do not favour price controls the latter have become during the last two decades a fact of life in many leading economies. There have been two basic objectives. Firstly, during the Second World War price controls, as part of a bigger complex, were used to secure a militarily optimal mobilization of resources. Thus (with the exception of China) all the major belligerent nations emerged from the war with a comprehensive system of price controls. Secondly, after the transition from the war economy many countries continued to control prices but for the new purpose of stabilizing them in the face of inflation.

There are several reasons why underdeveloped economies today are inclined towards price controls.

Firstly, in a planned underdeveloped economy the price relationships between commodities constitute one of the basic determinants of the volume and direction of private investment. As the private sector is eliminated in socialist economies, the matter is of no great importance to them. In this connection it is interesting to note that although the earlier developments in planning theory did not recognize the use of profit-and-loss calculus in the public sector, more recent developments place the public sector on the same footing as the private sector by emphasizing the difference between costs and returns as an important norm of efficiency. To quote a ready example, while India's first growth plans (1951–56, 1956–61) did not accept this point of view,[1] her third plan (1961–66) incorporates the theory that public enterprises must be carried on on a profit-making basis.[2] At the Ooty Seminar of the All India Congress Committee, which was organized to draft the policy recommendations for India's Third Plan, Professor V. K. R. V. Rao, initiating discussion on the subject, presented the following thesis:

'It is not only the expenditure on the public sector as such that will indicate the march of the economy towards its socialist goal. Even more important is the increasing role that the public sector must play for finding the resources needed for meeting both the maintenance and investment expenditure of Government. This involves a price and profit policy in regard to public enterprise. The theory of 'No

[1] There is no clear-cut discussion of this issue in the first two plans but there are *obiter dicta* at several points which support the line of thought suggested. See, for example, the chapter on 'Approach to the Second Five Year Plan' (pp. 21–42).

[2] Government of India, *Third Five Year Plan* (1961), Ch. IV; especially pp. 100–3. See also *Draft Outline* (1960), p. 61.

profit, no loss' in public enterprises is particularly inconsistent with a socialist economy, and if pursued in a mixed economy it will hamper the evolution of the mixed economy into a socialist society. The sooner, therefore, this theory of 'No profit, no loss' in public enterprise is given up and the policy accepted of having a price and profit policy for public enterprise such as will make the State increasingly reliant on its own resources . . . , the quicker will be the evolution of a socialist society.'[1]

If, then, the prime aim of the mixed economy is to secure a planned growth of investment, price controls cannot be altogether avoided.[2]

A second inducement to use price controls arises from the fact of underdeveloped economies starting from a low level of output. In the early years of planning in these economies the development expenditure raises money incomes of the population faster than output. The marginal propensity to consume from wage income is much greater than that from profit income. In consequence the demand for consumer goods, especially wage-goods like food, clothing, sugar, etc. will grow faster than demand for other goods. This sort of price inflation in a mixed economy runs counter to growth policy; while the former diverts resources to the production of consumer goods, the latter postulates that consumption be held in check and that resources be directed to the production of capital good.

A number of economists following Marshall and Robertson have, from time to time, supported a policy of moderate inflation to ensure economic growth.[3] But an excess of demand is advantageous only to a point—'the margin of tolerance' *à la* Galbraith.[4] If there is a sustained tendency for money expenditure to run ahead of output, prices will tend to get out of hand. This tends to reduce real incomes and the effect of this reduction impinges most on the poorest consumers. The prices of the few consumer goods on which they spend a large proportion of their incomes are likely to rise faster than those of other goods. This movement away from the more equitable distribution of incomes will probably be unacceptable to the authorities.

[1] *Economic Review*, Vol. XI, Nos. 6–7, July 22, 1959, p. 72.

[2] To quote from *India's First Five Year Plan*, 'For one to ask for fuller employment and more rapid development and at the same time to object to controls is obviously to support two contradictory objectives' (p. 43). Again, '. . . to dispense with (price) controls altogether is inconsistent with economic planning'. (Abridged People's Edition, 1952, p. 24.)

[3] For a recent view, see Professor R. G. Lipsey's letter in *The Times* of April 4, 1962. Professor Robertson has somewhat repudiated his view since the war. See D. H. Robertson, *Banking Policy and the Price Level*, 4th printing (revised), 1949; also Chapter VII ('Creeping Inflation') in his *Economic Commentaries* (1956).

[4] J. K. Galbraith, *A Theory of Price Control* (1952), p. 35.

Recent experience in fact suggests that in these circumstances they are likely to introduce price controls to neutralize such undesirable income effects.

Finally, prices, especially of wage-goods, in underdeveloped economies are generally very sensitive to small changes in demand and supply. Both demand for and supply of many such goods tend to be inelastic. This is inclined to bring about a situation in which there is a constant threat to the economy of violent price fluctuations. As these disturbances upset the balance of the national plan, it seems probable that the authorities will resort to price controls.

Although the use of controls in such a context is understandable, nevertheless they are likely to cause a serious malfunctioning of the economy. For price controls are ineffective unless working as part of a comprehensive system of controls. Even in a relatively isolated part of the economy, to be successful controls must be supported by rationing. Price controls are likely to be applied to commodities which are in short supply or subject to strong demand. In underdeveloped economies this means wage-goods. But the concentration of controls on certain goods only has adverse repercussions on the economy as a whole. For instance, if controls are imposed on wage goods, some purchasing power which would otherwise have been spent on such goods will be released and will be added to the pressure of demand on other goods. This causes resources to flow from the production of wage-(essential) goods to the production of other (non-essential) goods. A further repercussion is that income released as a result of the fixing of prices at an artificially-low level may be spent on black market purchases of wage-goods. There is a third possibility, however, namely that income which is not spent on price controlled goods (which could have been spent on them if prices had been free) will be saved voluntarily or wiped out by taxation. But the likelihood of this happening in underdeveloped countries is remote because of the already low level of real incomes.

Another aspect of the malfunctioning arising out of the introduction of price controls is that a critical piece of the economy's machinery for rationing its scarce resources is put out of action. The means by which consumers' preferences are made known is disrupted; the planner is compelled to assume the role of arbiter.

Although differences of opinion do exist among economists as to the desirability of price controls, the fact is price controls are with us and have been an established institution in some economies for twenty years. Accordingly, any theory that purports to be realistic must look upon price controls as a datum internal to the system.

The framework which the traditional demand theory assumes was developed by economists prior to the Second World War when the

public regulation of prices on any significant social scale had not yet occurred. The entire development of the theory since the war can be defined in terms of refinement of the analysis. The failure of demand theory to grapple with the phenomenon of institutional price controls may be considered an error of assumption rather than of analysis. Economists writing before the Hicks-Allen theory made no mention of price controls. When Hicks incorporated the indifference function in his general theory he did, however, make a passing reference to controls:

'This is a work on Theoretical Economics, considered as the logical analysis of an economic system of private enterprise, without any inclusion of reference to institutional controls. I shall interpret this limitation pretty severely. For I consider the pure logical analysis of capitalism to be a task in itself . . .'[1]

Demand theory since the arrival of the indifference function is in the nature of a derivative and does not improve upon the general framework assumed by the theory earlier.

One may contend that the time is now ripe for a further extension of the theory enabling it to take cognizance of price controls.

* (*b*) A second implicit assumption of demand theory, which like the first renders it of less general application, is that in a national economy the allocation of resources and the distribution of goods are based on *individual* preferences which are revealed in market behaviour. This means that the state has no autonomous preference function of its own. The economic activity of the organs of the state is induced by and is a perfect manifestation of individual preference functions. This is so untrue of present-day societies that any theory dependent upon such an assumption is subject to profound limitations when faced with the facts even of 'capitalistic' economies.

We have already assessed in Chapter 6 the area of the economy in which individual preferences either do not reveal themselves directly or just do not matter, whatever the form of economic organization. For example, the production of goods like museums, roads and parks; services such as police, defence, sanitation, communications, and so on. Such cases have been treated in the traditional analysis as

[1] *Value and Capital*, 1941 reprint, p. 7.

* Some of the views expressed in this section have since appeared in Jan Drewnowski's 'The Economic Theory of Socialism: A Suggestion for Reconsideration' (*J.P.E.*, August 1961, pp. 341–54). This section had been written long before Drewnowski's paper appeared. However at one or two points the argument of this section as it stood originally has been modified to conform to Drewnowski's phraseology. The phrase 'state's preference function' was referred to by the writer by the same name.

special cases and compressed under the heading of 'exceptions' to the theory. More recently, governments in many so-called 'capitalistic' countries have felt compelled to take collective measures to foster economic growth, which the individual economic activity, following the course of 'enlightened self-interest', has failed to bring about.

Now if a certain proportion of the community's productive resources is being used by the state without revealed individual preference functions (which are normally available to the private entrepreneur) being available to the state organs, the state must have some scale of values which is unique and from which its own preference function derives.

The area of the economy within which economic decisions are based on state rather than individual preferences has been gradually widened in nearly all societies. Professor Gustav Cassel, arguing in the first quarter of the century, conceived the state 'as a great compulsory organization for meeting the general collective needs of the people.' According to him, 'the essential function of the State is to be seen in the economic activity which is required for the purpose'. He continues:

'It is only from this point of view that we see clearly the necessity of the State, on which so much obscure phraseology has been expended, on the strength of purely economic considerations. This necessity, based upon the character of the purely collective needs, ought to be the starting-point of all financial science. It is only thus that the science acquires a solid nucleus, its essential sphere is laid down from the start with rigorous logic, and—what is very important—it is organically connected with the whole of economic science.'[1]

The table on page 118 brings out figures of public purchase of goods and services in some of the leading 'capitalistic' countries since 1953. The figures do not include public investment and some other items of collective expenditure such as private education. Taking these factors into consideration it seems probable that the public purchase of goods and services takes between 25 and 35 per cent of the community's resources in these countries.

In present day economic systems 'collective goods' form such an extensive group that these systems may perhaps be defined best in terms of the scope of the state's preference function. At the one extreme, we have socialist states where most allocative functions in the economy are governed by the preference function of the state. At the other, we have free-market economies where the scope of the

[1] G. Cassel, *The Theory of Social Economy* (1923), Vol. I, pp. 69–70.

Country	*Public authorities' current expenditure on goods and services (expressed as percentage of G.N.P.* 1953	1956	1959
1. Australia	9.81	8.87	9.87
2. Canada	14.95	14.05	13.09
3. France	15.75	14.58	14.82
4. Germany (Federal Republic)	15.11	13.52	14.36
5. Italy	11.59	12.35	12.65
6. Japan	9.25	9.72	9.56
7. UK	18.69	17.19	17.03
8. USA	20.28	17.36	18.28

Sources: 1. UK (*a*) Gross National Expenditure at Factor Cost, 1946–53, p. 2.
(*b*) National Income and Expenditure, 1961, p. 1.
2. USA (*a*) Statistical Abstract of the US, 1956, p. 253.
(*b*) Statistical Abstract of the US, 1960, p. 305.
3. Other countries. UN, *Yearbook of National Accounts Statistics, 1960* (published 1961).

state's preference function is moderate. We can of course visualize many intermediate cases. But there appears to be no possible situation in which the individual preference functions of single individuals can be effective over the entire range of production and distribution of goods. In the case in which both state and individual preference functions operate, if the two types of functions are inconsistent, the state's preference function is likely to override. This can happen, for example, when the state's planning organs decide that the consumer's choice of certain goods is wrong. The production of armaments exemplifies the case in which only the state's preference function matters. With the exception of some communist systems (e.g. Soviet Russia), in which consumers have no opportunity to reveal their preferences directly, output of consumer goods in most societies is determined largely by the individuals' preference functions. (We touched upon the possibility, in the last chapter, of even socialist countries accepting the individuals' preference functions as the norm for the production of consumer goods.)

Since the existence of the state's preference function is not a theoretical abstraction but a reality, any satisfactory theory of demand has to be built upon the dual system of preferences. It seems highly probable that the state's preference function has the same properties as the individual's, for in the last analysis the state's activity must aim at securing the fulfilment of wants of individuals in some unique way. While the two functions are likely to be related, it is important to remember that they are not mutually determined. The state's function must derive from its own scale of values.

The integration of the state preference function in the traditional

theory poses a new problem. However, this function is likely to be less inconvenient to handle than the individual function has been. It does not involve the economist in that intractable summation problem which he had to face in adding up numerous individual utility or indifference functions. In the traditional theory outlined in the first four chapters we have noted the attempt of the utility school to open a way to collective action by making individual utility functions cardinal and additive. This position has been under general attack. The position of the indifference school is similarly assailable, for no meaning can be attached to collective indifference curves.

In planned economies the state's preference function enjoys certain conceptual advantages over the individual's preference function in two other ways. Firstly, the national plan offers a ready mechanism by means of which the state's preference function can reveal itself. This comprises the statement of objectives and declared targets of physical outputs. Secondly, at the same time, the state's preference function reveals itself *ex ante*. Assessment of resources and the point at which the state's preference surface is tangential to the production possibility surface appear in the plan as pre-determined phenomena. In contrast, the production plans of entrepreneurs in a capitalistic economy can be based only on anticipated demand. The demand prices are at best an *ex post* market expression of consumer preferences. On the applied side the assimilation of the state's preference function should be greatly facilitated by the fact that the function reveals itself in the data which are numerical. By adopting any arbitrary unit of measurement these data can be treated as cardinal magnitudes.

To conclude, in an economy in which the decision-making rests partly with the state and partly with individuals, any satisfactory theory will have to be based on the dual system of preferences. The present state of demand theory, based as it is on individual preferences alone, appears to be in the nature of an antithesis to planning.

We have so far been concerned with indicating what the demand theory has neglected. Before taking leave of the subject we may mention that both the 'price controls' and the 'state preference function' are institutional factors which have become prominent only since World War II. It is appropriate that the general framework which the traditional theory assumes should now be re-examined by economic theorists and the main theorems restated accordingly.

III

Having discussed the assumptions which are implicit in the theory

but never clearly stated we may now focus our attention on the assumptions which are explicitly stated in the theory. These assumptions have already been considered in the formal account of the theory given in Part I. Here we shall evaluate these assumptions in relation to facts and probable situations of planned 'underdeveloped' economies. Later we shall take both implicit and explicit assumptions together and judge whether the main conclusions of the theory are realistic. If not, the theory may be considered at best an exercise in pure logic, at worst an exercise in futility.

(*a*) An individual's consumption pattern is determined by many factors which can be divided into economic and non-economic. The theory of demand seeks to set up a functional relationship between the economic factors and an individual's consumption pattern. Information obtained about each individual is then summed up to form suitable economic aggregates. Such aggregates help the economist to analyse and explain the collective behaviour of larger groups of individuals. In setting up the theory, the economist isolates economic from non-economic determinants of consumption. Since it is implicitly postulated that economic factors can operate only through income and prices, he concentrates on these two variables alone. The non-economic determinants of consumption such as culture, climate, age, occupation, etc. are lumped together as 'tastes' which are supposed to be relatively stable during the period to which a given demand schedule applies. The main justification for this practice is that the demand theory analyses only short-period changes and, it is believed, that during such short periods the influence of changes in tastes is negligible compared to the influence of changes in income and prices.

The assumption of the fixity of consumer tastes in the short run is basic to all the main approaches to demand theory and has been a standard assumption since it was first enunciated by the utility school. It has passed the test of empirical studies made in Sweden, the UK and the USA[1] and may be taken to hold true of consumer behaviour in other developed economies as well. Whether short-period changes in consumption patterns can be accounted for in terms of economic factors alone is yet to be verified in under-

[1] Sweden—H. Wold, *Demand Analysis* (1953); especially p. xi.
UK —R. Stone, *Consumers' Wants and Expenditures: A Survey of British Studies since 1945* (Cambridge, June 1961); especially items given reference Nos. 50, 225–6, 228, 230, 237 and 240.
USA —*Consumer Behaviour*, Vol. II, 'The Life Cycle and Consumer Behaviour', edited by L. H. Clark, 1955; US Department of Agriculture, *Family Income and Expenditures*, Miscellaneous Publications, No. 396; and National Resources Committee Study, *Family Expenditures in the United States*, 1941.

developed countries. The only underdeveloped country (of the type we are considering) to organize large-scale socio-economic surveys to discover changes in the 'pattern of consumer expenditure' is India. Massive statistical data relating to consumer expenditure over different time periods and covering a fairly large number of households in both rural and urban areas have been collected in four national rounds.[1] These statistics overwhelmingly confirm that except for 'wide fluctuations in the price level' and changes in *per capita* income, the pattern of consumer expenditure 'is likely to remain undistrubed in the short period'.[2] As the Indian data relate to the different regions of the country, with wide economic and social differences, the Indian experience is likely to be corroborated when statistical evidence from other underdeveloped countries becomes available. The hypothesis that the consumer tastes are relatively stable may, therefore, be accepted as true of short-period analysis, at any rate until experience of other underdeveloped countries refutes it. Although the Indian data have not so far been subjected to extensive analysis, it appears likely that when incomes are low, changes in price or income have a greater effect on consumption in the short period than they do when incomes are high. In 1957 an expert Indian committee analysed consumption data in terms of price and income changes for several goods such as sugar, tea, foodgrains, cloth, vanaspati (hydrogenated vegetable oil), soap, iron and steel, etc.[3] The Committee's analysis reveals that small price changes caused very great substitution effects, from which it may be inferred that the relationship between quantity demanded and income and prices is very strong in low-income countries. This permits the economist to analyse short-period consumption changes in these countries in terms of monetary factors alone.

The assumption of the stability of tastes, however, limits the usefulness of demand analysis, especially in the case of a planned economy. Planning authorities are but little concerned with short-period economic changes. From their point of view the relevant question is: how do consumption patterns change over longer periods and how may planning techniques be adjusted accordingly? In fact, most planned economies have two types of forward plan, a short-period plan of four to seven years and a long-period (pers-

[1] Government of India, Cabinet Secretariat, National Sample Survey, *Reports* Nos. 18 (1959), 20 (1959), 39 (1961) and 40 (1961).

[2] Government of India, Cabinet Secretariat, National Sample Survey, *Report* No. 20 (1959), p. 17.

Also see Indian Statistical Institute, Statistical Series No. 6, *Studies on Consumer Behaviour*, Chapter III.

[3] Government of India, Ministry of Food and Agriculture, *Foodgrains Enquiry Committee Report*, 1957.

pective) plan extending over fifteen to twenty-five years. In considering how economic resources may be suitably adjusted to consumption needs, it is important to know how the demand function changes in the course of time under the influence both of economic and non-economic factors. Here there is a strong case for interdisciplinary co-operation, especially between Psychology, Sociology and Business Economics. The difficulties of dealing with changing tastes are likely to be great but not insurmountable. It should be possible to analyse changes in consumption in terms of 'trends' and 'cycles'. This may enable us to establish the laws of change of consumption patterns. Once the demand function is developed with a certain trend factor incorporated, it should be possible to isolate the influence of economic from that of non-economic factors on this function. This will, in turn, enable the economist to make adjustments in the demand function obtained strictly from economic data, for he can now take account of the influence of non-economic factors which in this case is a given datum. In planned economies the task of making demand analysis dynamic by allowing for changes in tastes will be greatly facilitated by the fact that in such economies economic and some non-economic variables with which consumption is associated will be known, roughly, in advance from the planning data.

(*b*) Another explicit assumption of long standing which has been generally retained in spite of frequent vehement attacks on it is that the individual decision-maker is rational. We have already elaborated this complex assumption in our account of the theory. To recount briefly, it implies (*a*) that the individual has full knowledge of alternatives open to him, (*b*) that these alternatives are fixed, (*c*) that the individual knows the outcome of every alternative, and (*d*) that he behaves in such a way as to maximize 'something' which is subject to the law of marginal diminution. This 'something' is 'utility' in the utility and indifference analysis of consumer behaviour. In the revealed-choice (or preference) variants it takes the form, 'A consumer chooses (prefers) a larger collection of goods rather than a smaller collection'. This is supported further by the celebrated consistency postulate. The law of marginal diminution is implied in most approaches in the convexity of the behaviour curves. This law is a logical necessity for any equilibrium-type analysis of consumer behaviour. The theory of demand presented in Part I can, strictly speaking, be derived from the theory of consumer behaviour only if the individual consumer's behaviour accords with these assumptions.

The assumption of rationality permeates all logical economic theory and a fair amount of criticism of it has been offered in the past. In fact, it was the subject matter of a great debate in the latter

half of the nineteenth and the first quarter of this century.[1] Objections came mostly from the economists of the 'Historical' and the 'Institutional' schools. Extensive comments on the subject were later made by Professor Clark and Knight.[2] The basic objection to this assumption is its supposedly unrealistic character. The critics argue that in real life an individual's behaviour is the resultant of a large number of premises, some of which are 'conscious', some 'unconscious'. Behaviour resulting from conscious premises may be 'reasoned', hence 'experimental' and 'predictable'. But behaviour arising from unconscious premises may not be so. In fact, modern psychology emphasizes the predominant influence of habit, tradition, impulse and instinct on human behaviour. As the theory of demand is based on the 'consciously calculated behaviour' of the 'maximizing individual', its critics assert that it is at best a 'deductive inference' which can be justified only on grounds of (to borrow Gustav Cassel's phrase) 'childish pleasure'.[3]

The defence of the assumption has been rather indirect. It is argued that if we cannot reduce the chaotic diversity of the behaviour of individuals to a single, uniform and general pattern, we cannot have a general theory of consumer behaviour. Stigler states this position thus: 'The concept of a "maximizing individual" is indispensable if economic phenomena are to be treated scientifically, that is, if economic generalizations are to be secured'.[4] The necessity of adopting the assumption of rationality to secure scientific generalizations does not clear the economist from the indictment of unrealism. However, the defence of the assumption need not be so indirect. The economist is interested in the behaviour of groups. His goals are 'macro-economic'. He can therefore adopt the position that the theory of consumer behaviour 'is put forward as an account of reasonable behaviour to which actual behaviour in the mass may be supposed to approximate'. If observation shows that the behaviour of people in general does not deviate substantially from the pattern visualized by the economist, the conclusions of the theory of con-

[1] and [2]. W. C. Mitchell, 'The Rationality of Economic Activity: I', *J.P.E.*, 1910, pp. 97–113; and 'Human Behaviour and Economics: A Survey of Recent Literature', *Q.J.E.*, 1914, pp. 1–47; E. H. Downey, 'The Futility of Marginal Utility, *J.P.E.*, 1910, pp. 253–68; J. M. Clark, 'Economics and Modern Psychology: I, *J.P.E.*, 1918, pp. 1–30; and F. H. Knight, 'Ethics and the Economic Interpretation', *Q.J.E.*, 1922, pp. 454–81; and 'Economic Psychology and the Value Problem, *Q.J.E.*, 1925, pp. 372–409.

For a recent view, see J. K. Galbraith, 'Rational and Irrational Consumer Preference', *E.J.*, 1938, pp. 336–42; and G. Katona, *Psychological Analysis of Economic Behaviour*, 1951, and 'Rational Behaviour and Economic Behaviour', *Psychological Review*, 1953, pp. 307–18.

[3] *Op. cit.*, p. 82.

[4] *The Theory of Price* (1941), p. 64.

sumer behaviour may be accepted as valid. In any case it is useful to know the broad general tendencies of human behaviour in a given society. Here there is a strong case for inter-disciplinary research; psychologists, biologists, economists and others should work in concert to study the extent to which human behaviour in a given society is based on conscious motives and whether the resultant behaviour can reasonably support the various hypotheses adopted in the specific social sciences. Information of this kind is at present almost entirely lacking. In consequence, many economists suspect that the theories of consumer behaviour are non-operational. It is probable that empirical observations of the kind suggested will themselves throw up only statements of tendencies in human behaviour which cannot be reduced to quantitative analysis. Yet they are of value for the economist wishing to assess the validity, in an actual society, of the hypotheses which economic science has adopted.

Hypotheses which seek to explain consumer behaviour are of vital importance to planned economies. The planning authorities are prone to look behind the veil of 'revealed choice' to discover what ultimately determines observed behaviour. The function of planning runs bilaterally: it has to adapt the resources to the structure of wants as well as the structure of wants to the resources.

Planned economies are, therefore, likely to consider as serviceable for policy purposes all such explanatory hypotheses which can be supported by some logic even if they cannot be tested and proved. This is probably especially true of those underdeveloped countries in which there is a great dearth of primary statistics. Planning in these economies involves a considerable amount of reasoned judgment. The analytical contrivance of rational behaviour may be justified in the context of a planned underdeveloped economy on two grounds. Firstly, the impact of central planning is likely to give a utilitarian slant to habitual modes of thought as well as action. Severe penalties inflicted for economic offences in the socialist countries may be adduced as evidence of this tendency in planned economies. Secondly, the fact of low incomes in underdeveloped countries is likely to induce people to make careful use of their resources. At higher levels of well-being one can afford to be indifferent to small expenditures; at subsistence level people are likely to be more calculating. Against these tendencies, one must set the strong influence of habit and tradition on consumption patterns cultivated in underdeveloped countries over long periods of economic stagnation. Although habit and tradition are often cited as instances of irrational behaviour, it is not clear why this must always be the case. Rationality might well have filtered into habitual consumption practised over such long periods of time.

Further objections to the assumption of rationality have been put forward on the ground that it implies that the consumer has (*a*) perfect knowledge of his environment and (*b*) foresight to evaluate the outcome of alternative ways of spending his income. Another, though less important, implication of rationality is that the consumer has no—at least, known—'disutility' of consciously applying 'utility calculus' to his choices.[1]

Economists have generally believed that objections to the above-mentioned aspects of rationality have force when applied to the behaviour of the individual but they lose their force when applied to the behaviour of groups. Environment may not fully reveal itself to the individual consumer; it does reasonably well to a group of consumers. Sooner or later the ignorance of the individual consumer will pass under the scrutiny of the group and be modified. Professor Knight objecting to the assumption of rationality has drawn attention to the 'explorative' element in human behaviour:

'. . . there is always really present and operative, tho' in the background of consciousness, the idea of and *desire for* a *new want* to be striven for when the present objective is out of the way. Wants and the activity which they motivate constantly look forward to new and "higher", more evolved and enlightened wants and these function as ends and motives of action beyond the objective to which desire is momentarily directed. The "object" in the narrow sense of the present want is provisional; it is as much a means to a new want as end to the old one, and all intelligently conscious activity is directed forward, onward, upward, indefinitely.'[2]

In fact, the idea of explorative activity goes further back in the theory of consumption. It is mentioned in Jevons's 'Theory'.[3] The latter took it over from T. C. Banfield who set forth the proposition that 'the satisfaction of every lower want in the scale creates a desire of a higher character'.[4] Jevons substituted for it the statement that the satisfaction of a lower want permits a higher want to manifest itself.[5] If statistical evidence demonstrates that there is a trace of the exploratory element in the economic behaviour of the individual, in all probability it is likely to manifest itself in the 'non-recurrent'

[1] This implication was either passed over in the historical debate on 'rationality' or else not noticed. It was brought into prominence in the development of the theory of risky choices, especially the development of Neumann-Morgenstern theory. (See Chapter 4.)

[2] 'Ethics and the Economic Interpretation', *Q.J.E.*, XXXVI, 1922, pp. 458–9.

[3] W. S. Jevons, *Theory of Political Economy*, 4th edition, 1911, pp. 41–2.

[4] and [5]. W. S. Jevons, *ibid.*, and A. Marshall, *Principles of Economics*, 8th edition, 1920, p. 90n.

items of expenditure. Its strength, therefore, has a correlation with the percentage of the non-recurrent expenditure in the total budget of the consumer. In the case of recurrent expenditure the frequency of purchases is likely to bring about a situation in which the consumer has effective knowledge enabling him to act to his best advantage.

The assumption of rationality is the heart of the logical analysis of demand. If it cannot be sustained, then demand theory reduces to chaos; and nothing but a spurious dignity is gained by calling demand analysis 'the law of demand'. At the present time, the empirical foundation of the theory is very weak and unreliable. In Part I we referred to some experiments by economists and psychologists to verify the assumption of rationality. As was pointed out before,[1] these experiments are unable to provide a solid empirical foundation for the theory. Firstly, these experiments were conducted under 'controlled' conditions. Secondly, they dealt with 'hypothetical' and not real choices. And thirdly, they dealt with artificially simple choices and thus provide but limited guidance to human behaviour in a complicated environment.

From the point of view of mixed economies there are one or two factors which need to be considered. Firstly, the act of central planning involves institutional changes. In underdeveloped countries these changes are bound to be radical as these countries move from the 'pre-industrial' (or 'feudal') to the industrial patterns. This means that the instability of environment becomes an important influence on consumer behaviour in these economies. On the other hand, as these changes are deliberate and planned, their assessment becomes easier. In the second place, owing to the scarcity of resources for consumption it is probable that the degree of standardization of consumption in underdeveloped countries is high. The experience of many socialist countries points out that during early years the emphasis of planning is on the production of a few standard goods rather than on 'variety'.

IV

Before we embark upon an overall assessment of the theory, a brief comment on Marshall's *ceteris paribus* assumption is necessary. This assumption has been relaxed in the recent development of the theory but as Professor Clark observes, 'Utility theory is not ready for complete discard.'[2]

[1] See above, pp. 59–64.

[2] J. M. Clark, 'Realism and Relevance in the Theory of Demand', *J.P.E.*, August 1946, p. 348.

In Chapter 1 we referred to Marshall's device of impounding two supposedly long-period variables in *ceteris paribus*.[1] These are (*a*) the price of every commodity other than the one in question and (*b*) the 'income'[2] of the consumer.

To be valid all scientific laws must be hedged with the *ceteris paribus* qualification. Concluding his *Revision of Demand Theory* Professor Hicks observes, 'In its elementary form, the theory only claims to be true "other things being equal"; and the same qualification persists however far the process of generalization is carried. For generalization consists in nothing else but the letting of some "other things" out of Marshall's "pound"; but however many things we let out, some will remain always inside.'[3] We have already shown in Chapter 2 that the form in which Marshall adopted the *ceteris paribus* assumption in his theory of demand is logically untenable.[4]

Empirical studies do not normally neglect the influence of changes in income on consumer's demand. In fact, income—in some cases, expenditure[5]—and price elasticities are generally worked out separately in making demand forecasts. Where data have been somewhat intractable is in the field of estimating cross-elasticities. Marshall's abstraction from this difficulty is highly gratuitous when viewed in the context of low-income countries. In these countries a small change in the price of one commodity is likely to generate powerful substitution effects through shifts in the real income. This may be seen, in the case of several goods from the Indian data on consumer expenditure. For example, since 1949 every rise in the price of ghee (clarified butter), butter and other milk products has been accompanied by a rise in the consumption of vanaspati (hydrogenated vegetable oil) leading, in turn, to an increase in the price of the latter. A similar relationship has been observed between toilet soap and washing soap.[6]

[1] See above, p. 19.

[2] The traditional view favours the 'money income' interpretation. Friedman and Knight hold the view that 'we have to choose in analysis between holding the prices of all other goods constant and maintaining constant the "real income" of the hypothetical consumer'. (See above, p. 19n) and F. H. Knight, 'Realism and Relevance in the Theory of Demand', *J.P.E.*, December 1944, p. 299.

[3] p. 189.

[4] See above, p. 34.

[5] The Indian studies of consumer behaviour are based on total expenditure owing to the lack of data on income. See (1) Govt. of India, *Report on Pattern of Consumer Expenditure*, No. 20, 1959, p. iii; and (2) *Studies on Consumer Behaviour*, Indian Statistical Institute, Statistical Series No. 6, 1960, p. 2.

[6] National Council of Applied Economic Research, New Delhi, *Demand Forecasts for Consumer Goods* (1959); see especially Chapter V and Statistical Tables I to XXXIII.

V

Our appraisal of the assumptions of demand theory leads to two major questions. First, are the assumptions of the theory, taken as a whole, reasonable? Second, is the theory based on these assumptions operational? Suspending our judgment for the moment on the first question we may consider whether the traditional theory, as outlined in Part I, actually serves any practical purpose.

This last comment already indicates that we believe economics to be a 'realistic science', and economic investigation, if it is to serve the ends of economic policy, must be based on a practical foundation. This may not be, and is not, true of all the laws of economic science. Economics is a 'positive science'.[1] Like some of the laws of positive science, some of its laws are didactic, displaying a high degree of logical consistency but void of application to practical problems.[2] On the other hand, some of the laws of economics fit the observed facts but their accuracy cannot be demonstrated in the strict, logical sense.[3] In between lie all the laws which do not wholly belong on either side.

Our inquiry has been concerned with assessing the character and merits of the traditional demand theory. We chose the 'planned mixed economy' to serve as the backdrop for our inquiry and it will be helpful to bear in mind its broad outline as given in Chapter 5.

The theory has three main types of analysis. Firstly, the marginal utility analysis. This approach commits the economist on psychological issues. To explain how consumers budget their income between different goods and services, the utility theorist argues not from the observed behaviour of the consumer but from his 'motives' and 'valuation'. Secondly, we have the indifference analysis. Although the latest (Hicks-Allen) formulation takes the consumer's indifference-preference system as given, the earlier version of the theory contains some of the major psychological elements of the marginal utility analysis. Both Edgeworth and Pareto worked with indifference curves which they derived from 'index (or utility) functions'.[4] In the third place, we have revealed preference analysis

[1] There are two major types of 'positive science'; 'pure' such as formal logic and pure mathematics, and 'realistic' such as physics, chemistry and biology. This distinction is drawn out in Bertrand Russell's *Principles of Mathematics*, 1903, (p. 5), and is discussed by Pigou in *Economics of Welfare*. (See 4th edition, 1952, pp. 5–7.)

[2] E.g. Indifference-analysis, especially collective indifference curves.

[3] 'Castro hypothesis' may be considered as an example of this kind. According to this hypothesis, family fertility (as measured by actual number of children born) is high at low-nutrition levels. Observation of the population behaviour in India, Pakistan and China confirms the truth in this hypothesis.

[4] See above, p. 46.

which reads off consumer preferences from observed choices. This approach deliberately avoids offering any explanation of economic behaviour. It is a logical exercise which asserts an obvious relation between two co-efficients, that positive income elasticity implies negative price elasticity. To the economist (or the policy-maker) who is interested in understanding the behaviour of variables which determine the 'nature' and 'extent' of demand, the revealed preference analysis offers no guidance. This type simply assumes away the real issues by postulating that income elasticity is positive.

In Part I we observed that it has not so far been possible to find quantitative counterparts to the hypotheses underlying the theory. Statistical measurement and testing of the two main types of analysis, 'utility' and 'indifference', is neither wholly reliable nor adequate. Until empirical methods can reveal utility and indifference functions of individuals, the theory of demand will remain 'non-operational'. This does not mean, however, that the theory should be summarily dismissed. It has played, and can continue to play, a useful role in economic analysis. It is not only intellectual curiosity that has attracted some of the best minds in our discipline towards demand analysis. Of course, the 'intellectual curiosity' explanation cannot be denied. Professor Pigou takes up this issue as the opening question of his *magnum opus*:

'When a man sets out upon any course of inquiry, the object of his search may be either light or fruit—either knowledge for its own sake or knowledge for the sake of good things to which it leads. In various fields of study these two ideals play parts of varying importance. In the appeal made to our interest by nearly all the great modern sciences *some* stress is laid both upon the light-bearing and upon the fruit-bearing quality, but the proportion of blends are different in different sciences. If it were not for the hope that a scientific study of men's social actions may lead, not necessarily directly or immediately, but at some time and in some way, to practical results in social improvement, not a few students of these actions would regard the time devoted to their study as time misspent. That is true of all social sciences, but especially true of economics.'[1]

Demand theory, although so far comprising unverified logical hypotheses, has important uses at two levels. First, it offers some tentative working hypotheses to the empirical economist. Statistical

[1] *Economics of Welfare*, p. 4. Similar views are held by Knight. See his 'Realism and Relevance in the Theory of Demand' (*J.P.E.*, December 1944) where he observes: '. . . the practical significance of economic theory is in the field of social action, not of individual conduct.'

investigation throws up two major problems; first, organization of data and, second, analysis of data. How can a field worker decide, in the absence of any hypothesis, what sort of data to compile, what to accept, what to reject? Similarly, difficulties are bound to arise if an attempt is made to analyse data without employing any hypotheses. It may be admitted that serviceable hypotheses must have some *a priori* plausibility derived from observation, experience or introspection. But it is doubtful if statistical investigation can be fruitful without the help of some theory. Statistical enquiries may falsify some of our hypotheses, but having some hypotheses is a prior methodological requirement. Joan Robinson, criticizing the apparent methodological basis of Simon Kuznets's recent work, which seems to imply that a sufficient collection of empirical data will lead to a hypothesis to explain them, warns 'that facts without theory . . . leads to dogmatism on the basis of *post hoc ergo propter hoc*'.[1]

Demand analysis is useful, in the second place, to those who take collective decisions on behalf of society to determine the broad structure of consumption. In planned economies its role cannot be exaggerated. We indicated earlier (Chapter 6) that the planner has to make some vital decisions bearing on the use of resources for consumption. Demand analysis provides him with some insight into the nature of the determinants of demand. Although none of the underlying hypotheses provides a quantitative, measured description of consumer behaviour yet the formal insight gained into the 'complex of conditions' lying behind the demand equations can be useful. From the point of view of the policy-maker, the theories which attempt to go behind 'observed choice' to make explicit how that choice comes into being are preferable to those that do not. Moreover, collective planning of the structure of consumption brings about changes in individual consumption relationships. The likelihood of the policy based on some knowledge of the determinants of choice achieving success in certainly greater than that of the policy operating in a vacuum.

VI

We may now turn from the scope of the theory to an overall assessment of its assumptions. In fact, the scope of any theory is limited by the character of its assumptions. In the first four chapters we presented a critique of the logical theory of demand and explained its inner weaknesses. Of the three main variants, utility theory has the virtue of simplicity; of the immense number of variables jointly

[1] Simon Kuznets's 'Six Lectures on Economic Growth' (book review) in *J.P.E.*, February 1961, p. 74.

determining the demand for a commodity it considers only one, namely price, which is supposed to have the greatest influence on it. This is the clue to the mixture of strength and weakness in the utility theory. Indifference-preference theory enables the economist to take many variables into consideration but as we get away from the simple price-quantity equation the demand equation gets increasingly complicated. From the point of view of pure analysis the indifference-preference theory scores high. From the practical point of view its only merit seems to be its analysis of income and substitution effects. However, as was previously noted,[1] on the plane of observation income and substitution effects cannot be separated. Until empirical studies can show that one theory works better than the other, the practising economist can find little to choose between them. Revealed-preference theory is, we believe, pedestrian. As was shown in Chapter 4, the character of its assumptions is highly arbitrary. Moreover, the practical use of this theory is limited, as it takes observed behaviour as an ultimate fact and does not seek to explain it.

After introducing aspects of mixed economies in Chapter 5 we delineated in Chapter 6 the area of the economy within which the demand theory could play a meaningful role. The discussion was in terms of the uses of 'demand function' which is the end-product and to explain which the economists developed the logical theory of demand. Although we were concerned, by and large, with planned economies, we also took the opportunity to develop limitations to which the demand theory is subject even in 'capitalistic' economies. In this chapter we have been concerned with the assessment of the assumptions on which the logical theory of demand is based. Our analysis makes it clear that the existing set of assumptions imposes some limitations on the scope of the theory. Abstraction of the theory from price controls and the state's preference function restricts the scope of the theory to only a part of the economy. Since this part is steadily shrinking, any general theory of demand will have to take cognizance of these phenomena. The assumption of stability of tastes implies that prediction of demand is not possible if human behaviour is dynamic. In an age in which societies have become growth-conscious and economic environment is rapidly changing, this restraint on the demand function needs to be lifted. This is no light task. Professor Knight has given a forewarning that 'if it is in the intrinsic nature of a thing to grow and change, it cannot serve as a scientific datum. A science must have a "static" subject-matter; it must talk about things which will "stay-put"; otherwise its statements will not remain true after they are made and there will be

[1] See above, p. 74.

no point to making them.'[1] We have already made a suggestion which will help to circumvent Knight's objection; namely discovering tentative laws of change of tastes. Success depends on whether empirical data are amenable to such scientific manipulation. The assumption of rationality is the centrepiece around which deductive theory is constructed. We concluded our discussion of this assumption with a big question mark. Perhaps the case here is for an intensive behaviouristic analysis. Already two economists, Ruby Norris and George Katona,[2] have applied themselves in this direction. They both discard the logical theory of consumer behaviour and approach demand via analysis of consumer expenditure. To quote Katona, 'Unlike pure theorists, we shall not assume at the outset that rational behaviour exists or that rational behaviour constitutes the topic of economic analysis. We shall study economic behaviour as we find it.'[3] The behaviouristic approach of Norris and Katona has not produced any positive results. But further research in this field may throw some light on the merits of the assumption of rationality.

Our study has been provoked to a large extent by the reaction against micro economic theory in recent years. The scepticism has been voiced generally but has been most forceful in economies which have recently instituted a measure of central planning and where the practical relevance of the existing theory has been most open to question.

Our study has tended to show that the existing theory, like any other theory, has certain limitations. We believe, however, that some of them can be lifted. In addition the theory requires to be extended at points if it is to work as a general theory of both the allocation of the economy's resources and the distribution of outputs. We have tried to indicate the points at which further developments should take place.

Our main conclusion is that the reaction against the theory of demand has gone too far and has tended to ignore the positive role which the theory has to play and which this study has endeavoured to bring out. We have attempted to show that the usefulness of the theory is not restricted to 'capitalistic' economies; it also has a meaningful role to play in the context of 'mixed' and 'socialist' economies. Recent developments in thought in socialist countries are showing that these countries are realizing that their earlier extreme reaction to traditional economic theory was unjustified.

[1] 'Ethics and the Economic Interpretation', *Q.J.E.*, XXXVI, 1922, p. 456.

[2] R. T. Norris, *The Theory of Consumer's Demand*, 1941 (revised edition, 1952); and G. Katona, *Psychological Analysis of Economic Behaviour*, 1951.

[3] *Ibid.*, p. 16.

The need of the underdeveloped economy to make proper use of economic theory is, if anything, greater than that of other economies in view of the general scarcity of its resources.

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