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ASPECTS OF DEMAND THEORY

By

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A Thesis Submitted to the Graduate Faculty

for the Degree of

MASTER OF SCIENCE

Major Subject: Consumption Economics

Signatures have been redacted for privacy

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I.. HISTORICAL SURVEY OF MARGINAL UTILITY ANALYSIS IN RELATION TO DEMAND THEORY

A. Introduction

The 1870's ushered in one of the most fruitful and spectacular periods in the development of economic analysis. First historically, and logically fundamental to later developments, was the joint, though independent, discovery of marginal utility analysis by William Stanley Jevons, Carl Menger, and Leon Walras.

If Ricardo had stated his problem to a physicist of his day he might have phrased it as follows: I am attempting to understand phenomena which I find may be roughly classified into groups. A change in one of the classes provokes changes in the other ones. What techniques would you suggest for the analysis of this system? The answer would have been that the system involves a set of interdependent variables; one variable may be expressed as a function of one or more other variables. In the analysis of variables of this nature it is important to note the rates of change in the dependent variable rather than total change.

The failure of the classical economists to utilize the principles of differential calculus as an analytical tool prevented the incorporation of demand into their economic theory, although they recognized its importance in the determination of value. As well, their philosophical ideas of value, associated with ethical worth of labor expended, turned

classical economists to cost of production as the determinant of value. For these reasons they stressed the supply side in their theory.

Marginal analysis was, in reality, no more than the application to economics of the tools of analysis long found useful in physical sciences. It was the focusing of attention upon rates of change that led to the distinction between total utility and the utility of any portion of a given stock - the key to the value-in-use and value-in-exchange paradox in classical theory.

With analytical tools capable of handling it, demand could then be incorporated into a theoretical structure. Not only was demand theory included in economic analysis but it became the focal point of attention.

Marginal analysis centered attention upon the individual trying to maximize satisfactions, given alternative ends and limited means by which to achieve these ends. It lead to the conscious placing of choice-making as the motivating force behind economic activity; demand was placed in causal relationship to the rest of the interdependent variables of the system. It is not until this period that we find theoretical formulation of laws of demand.

Because of the philosophic and psychological beliefs of some of the early exponents of marginal analysis, in its development it was connected with hedonistic psychology. Although hedonism was not necessary to the development of marginal utility, the analysis was colored by this relationship. Choice was decided upon the basis of mental calculations of the pleasure-giving qualities of the goods or

services. "Pleasure" was understood in a definite substantive sense, and not just a "that which is maximized." A further ground for much criticism was the belief of some of these early exponents in the theoretical measurability of utility.

The successive attempts to purge the hedonistic elements from marginal utility analysis did little to change the fundamental principles. Money incomes are thought of as allocated according to "marginal" principles along alternative channels of diminishing significance as the result of attempts rationally to maximize psychic incomes.

Paretian and Hicksian developments in the theory of consumer demand stem from a desire to divorce the formulation of demand laws from any reliance upon hedonistic psychology or upon assumptions as to the measurability of utility.

Paralleling the development of an objective basis for demand theory, some of the recent literature has been devoted to discussions of the measurability of utility. The work entails a high degree of mathematical logic and is extending out into philosophic consideration of the absolute or relative nature of the subject matter of economics.

B. Predecessors

It is impossible to establish priority in the development of marginal utility analysis. William Stanley Jevons, Carl Menger, and Leon Walras are usually credited with the discovery of the analysis. However, as is true in most cases, elements of the concept are found in the writings of predecessors of the men mentioned above.

The writings of Abbe Condillac,¹ Jean Baptiste Say,² Samuel Baily,³ F.M. Lloyd,⁴ and many others had suggestions as to the subjective element present in the determination of value. Nassau Senior, in 1836, stated the utility principle and that cost affected price only indirectly. However, his theory of value was developed on Ricardian principles.⁵

Hermann Gossen was the first to incorporate the marginal utility concept into a system of economic analysis. Gossen was an anticipator rather than a forerunner of the developments in the 1870's. His analysis

¹Le Commerce et le government considérés l'un à l'autre, Jombert et Cellot, Amsterdam and Paris, 1776.

²Traité d'économie politique, Paris, 1803. (New Amer. ed. tr. by C. Prinsep, Grigg and Elliot, Philadelphia, 1844).

³A critical dissertation on the nature, measure and causes of value. R. Hunter, London, 1825.

⁴A lecture on the notion of value. Delivered before University of Oxford in Michaelmas Term, 1853. See Seligman, E., On some neglected British economists, Economic Journal, 18557, 1903.

⁵An outline of the science of political economy, p. 12. G. Allen and Unwin Lt., London, 1938.

⁶Gossen, H. Entwicklung der Gesetze des menschlichen Verkehrs und der daraus fliessenden Regeln für menschliches Handeln. Braunschweig, Vienna, 1854.

was founded on utilitarianism, a consumption approach, and the mathematical method.

He formulated a law of decrease in demand from which he developed the following principles: diminishing marginal utility with increased supplies, the rate of diminution was itself diminishing, and the necessity of equating utilities at the margin in order to achieve maximum satisfaction.

"In order to obtain maximum sum of enjoyment, an individual who has a choice between a number of enjoyments, but insufficient time to procure all completely, is obliged, however much the absolute amount of individual enjoyments may differ, to procure all partially, even before he has completed the greatest of them. The relation between them must be such that, at the moment when they are discontinued, the amounts of all enjoyments are equal."⁷

Although Gossen's book contained the main elements of Jevonian and Austrian contributions it received no recognition during his lifetime. The first edition was withdrawn by the author, and it was not until 1889, subsequent to recognition by Jevons and Walras, that the book was reissued.

⁷Cited in Roll, E.A. A history of economic thought, p. 372.
Prentice-Hall, Inc., New York, 1959.

C. William Stanley Jevons

In 1871 William Stanley Jevons published his Theory of Political Economy.⁸ Working independently, the English economist developed the marginal utility analysis along the lines used by Gossen.⁹

Jevons accepted utilitarian philosophy, his concept of economics leading him to investigate the wants of men and to try to formulate laws concerning them.

"Political economy must be founded upon a full and accurate investigation of the conditions of utility, and to understand this element, we must necessarily examine the character of the wants and desires of man. ---- The whole theory of economy depends upon a correct theory of consumption."¹⁰

To Jevons economic activity was motivated by individuals seeking to maximize actions leading to physical pleasure and avoiding or minimizing actions causing physical pain.¹¹ As these pleasures are attained only indirectly, through the consumption of goods, Jevons reasoned that it must be this pleasure-giving characteristic (utility) of goods that determines their value.

⁸ Macmillan and Company, London.

⁹ The term "marginal" was not used by any of the discoverers of the utility approach. It was first used by William Smart in his translation of the work of Austrian economists.

¹⁰ Jevons, W.S. Theory of political economy. pp. 46-47. Macmillan and Company, London. 1871.

¹¹ For a more detailed account of Jevons' conception of the economy. Ibid, pp. 27-32.

"Repeated reflection and inquiry have led me to the somewhat novel opinion that value depends entirely upon utility --- we have only to trace out carefully the natural laws of the variation of utility, as depending upon the quantity of commodity in our possession, in order to arrive at a satisfactory theory of exchange ----. Labor is found often to determine value, but only in an indirect manner, by varying the degree of utility of the commodity through an increase in supply."¹²

Although, most certainly, Jevons' hedonistic psychology colored his analysis it was the use of the principles of calculus that allowed him to incorporate the role of demand into his economic analysis. With this tool he overcame the classical paradox of value-in-use and value-in-exchange, and was able to conceive of utility as the determinant of value; money costs of production as a derivative of demand.

A commodity Jevons defined as any object, action, or service which can afford pleasure or ward off pain; utility as the abstract quality whereby an object serves our purpose.¹³ Utility is not an inherent quality, rather that it is a circumstance arising out of a good's relation to man's requirements; and this utility varies according to whether one already possesses more or less of the same good.¹⁴

¹²Ibid. p. 2. It would seem that the claim for utility is over-emphasized because (on the same page) of the admission of the role of costs.

¹³Ibid. p. 45.

¹⁴Ibid. pp. 52-53.

To explain his law of variation in utility Jevons used the diagram duplicated in Figure 1. The line OX represents the total

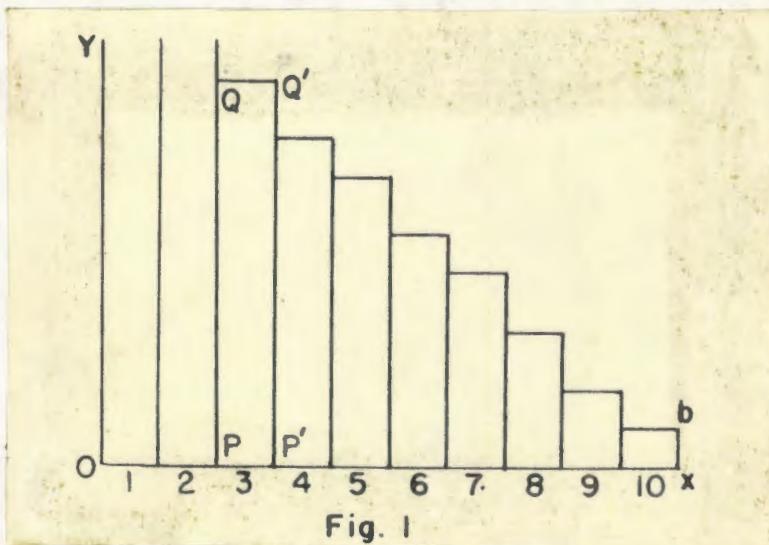


Fig. 1

quantity of any commodity which is divided into ten equal parts. The area of the rectangle above each number represents the utility of that part or increment of the total quantity.¹⁵ If we assume the commodity to be the quantity of food eaten in a twenty-four hour period the addition of the tenth unit adds less to total utility than did any former unit.¹⁶ The first and second units of food are those necessary to life and therefore their utility is infinite (areas above these two units are undefined in Figure 1.)¹⁷ The intensity of utility of

¹⁵ Ibid. p. 55.

¹⁶ It would be better to think of the commodity as the quantity of food eaten at one meal. If the fourth unit of food was eaten some hours after the first three had been consumed at one meal, the fourth unit might well add more to utility than did the third. This difficulty arises because Jevons does not assume "ceterius paribus" conditions.

¹⁷ Ibid. pp. 54-55.

the third increment is measured by either PQ or $P'Q'$, and its utility is the product of the units in PP' by those in PQ' .¹⁸ Thus the utility is a product of two dimensions: the quantity of the commodity and the intensity of the effect upon the consumer.

If the increments could be conceived of as infinitely small the utility curve might be pictured as a downward sloping continuous curve. The vertical distance between the base line and the curve at any point would be the measure of the utility of an infinitely small increment of the good at that point.¹⁹ This analysis leads directly to the distinction between total utility (value-in-use) and the final degree of utility (value-in-exchange).

Total utility is a function of the quantity of the commodity and is represented by the total area under the downward sloping utility curve.²⁰ The degree of utility at any point will be the utility a small increment of quantity adds to the total utility divided by the quantity in the increment. It is represented graphically by the height of the curve at that point.²¹ The degree of utility is, in

¹⁸Ibid. p. 57. ¹⁹Ibid. p. 57. ²⁰Ibid. p. 59.

²¹This involves a slight error due to the necessary assumption that the added utility is spread uniformly over the entire increment. If the added quantity is taken to be infinitely small (as in calculus) the error is negligible.

mathematical language, the differential coefficient of "u" [utility] considered as a function of x [quantity of the good].²²

In economic analysis the final degree of utility is of major importance for it furnishes the clue to the problem of differing value in use and in exchange. It would be impossible to live without water but because it is so abundant its final degree of utility or its value is zero. If the supply of water were curtailed, we would regard water as having a high final degree of utility.²³ The final degree of utility "varies with the quantity of the commodity, and ultimately decreases as that quantity increases."²⁴

Jevons applies his utility theory to the solution of the problem of allocating a good among its various uses. Men will remain satisfied as long as no alternative course would yield more pleasure; "which amounts to saying that an increment of commodity would yield exactly as much utility in one use as in another."²⁵ The equating of final degree of utility would, therefore, yield maximum pleasure. It is doubtful that Jevons conceived this principle as the one governing the allocation of money income. First, because all examples of the principle are confined to specific commodities such as timber, iron, and food. Second, his entire utility analysis is never translated into monetary terms.

²²Ibid. p. 61. ²³Ibid. p. 62. ²⁴Ibid. ²⁵Ibid. p. 69.

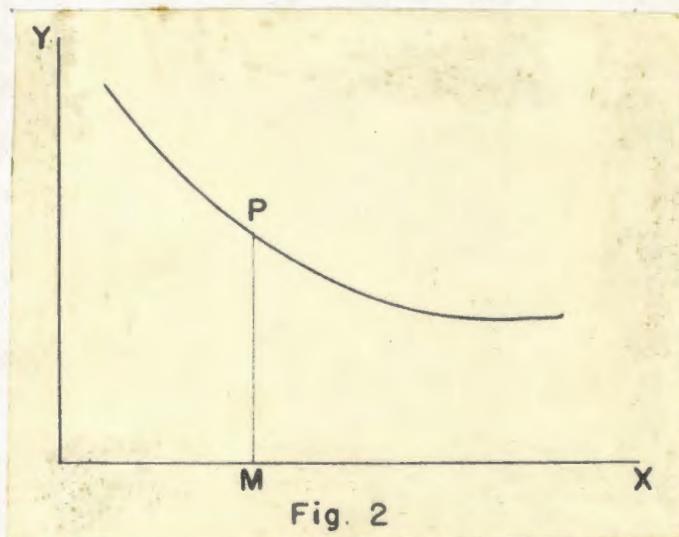
The question of the most advantageous distribution of goods over time may be solved by the same equating of utilities at the margin. As we cannot be certain that the good or the want for it will last, future allocations will be reduced in quantity according to the probability of the good or want remaining as anticipated.²⁶ The quantity allocated to future uses would be reduced further because man does not have perfect foresight; future feelings being less powerful than present ones.²⁷

Jevons distinguishes between several kinds of utility for he felt that the proper conception of utility was one of the main difficulties of political economy.²⁸ Iron rails have actual utility, iron in a merchant's store has prospective utility, and iron in the bowels of the earth has potential utility.²⁹ Potential utility is transformed into prospective utility only where there is some probability that the object will be needed. Potential utility does not lie within the scope of economics for "it is a question of physical science whether a substance possesses qualities which might make it suitable to our needs."³⁰

²⁶Ibid., pp. 75-78. If we assign a probability (p) of $\frac{1}{2}$ to the first day and 2 to the final degree of utility (v), the produce ($p.v$) of the two would equal 1. The probability of the second day is estimated to be $\frac{1}{2}$. To have the product of v', p' equal 1, v' must equal 4. The increase in the final degree of utility occurs because of a decreased quantity allocated to the second day.

²⁷Ibid., p. 76. ²⁸Ibid. ²⁹Ibid., p. 75. ³⁰Ibid., p. 75.

A weakness in Jevons' utility analysis is his failure to make the translation from utility to demand curves. Because of this omission he violates one of his fundamental assumptions - the impossibility of interpersonal comparisons.³¹ In order to have a continuous curve, Jevons uses a utility curve representing the consumption of a nation as a whole; quantity consumed measured along the horizontal axis and intensity of desire on the vertical axis.³²



At the point M in Figure 2 the marginal utility of the last increment is measured by the line PM. Using the same vertical scale to measure the intensity of desire for all people in the nation clearly involves interpersonal comparisons.

³¹In Jevons' introductory chapter (p. 27), he states that it is impossible to compare the amount of feeling in one mind with that in another as there is no common denominator of feeling.

³²Ibid., pp. 57-58.

This fallacy is seen more clearly when Jevons attempts to explain the mechanism of exchange by utility and disutility curves.³³ Persons within the trading body reach equilibrium when the loss in utility of the quantity of the good sacrificed is equal to the utility gained in the good acquired. This analysis also implies that all persons gained the same utility (as measured by the distance between the base line and the point of intersection) from a given increment of a commodity.

If the translation had been made to demand curves the analysis would be in terms of marginal-demand-price paid rather than of utility gained or lost by persons in the nation or trading body. Equal demand prices on the part of consumers does not imply that the utility of the purchase is the same to all people.

Jevons' analysis did not make clear just how a consumer would proceed to maximize his position. Given the actual goods and services necessary to satisfy all wants Jevons' principle of allocating goods among various uses covers the field. He did not, however, extend his principle to show it is through the allocation of general purchasing power in the market that the consumer expresses his desires and attempts to maximize his position.

³³Ibid. pp. 96-98.

D. Carl Menger

The Austrians developed the subjective theory of value more fully than did its predecessors or contemporaries. They analyzed utility so as to base their entire economic analysis upon subjective valuation. Causation in the market running from this valuation to price, and from value of consumption goods to the value of production goods. Cost of production, therefore, does not determine value but is a derivative of demand.

The Austrians conceived of the central problem of the economy as that of individuals facing numerous ends with but scarce means of satisfying these ends, consumer demand being the result of attempts to maximize satisfactions. Choice-making, then, is the motivating force behind economic actions. This concept and the Austrian analysis focused attention upon demand as the central aspect of the economy.

In 1871 Carl Menger laid the foundation for the Austrian contribution with the publication of Grundsätze der Volkswirtschaftslehre.³⁴ Wieser³⁵ was next in developing Menger's work, extending the subjective theory into the field of costs and expanding the psychological analysis. The last of the three founders was Eugene Böhm von Bawerk, best known

³⁴ Vienna. (London School of Economics and Political Science Reprints of Scarce Tracts No. 17.) London, 1934.

³⁵ *Der natürliche Werth*, 1887. (Tr. by Christian Malloch, Macmillan and Company, Ltd., London, 1893). *Theorie der gesellschaftlichen Wirtschaft*, 1914. (Tr. by A.F. Hendricks, Greenberg, New York, 1927).

for his work in capital theory.³⁶ The leading Austrian writers formed a school in the true sense of the word. Their methodology was the same: non-mathematical and deductive, the latter in opposition to the Historical school, and the three worked in virtual collaboration. In their economics they centered attention upon value and the subjective theory of value was their chief doctrine. Their object was to develop a unified analysis based on subjectivity.

As Menger's subjective analysis was the basis for the work of the later Austrian economists, we shall examine only his contribution to demand theory.

Menger sought to free economics from its inconsistencies by basing his analyses upon the fundamental laws of causation. The treatment is non-mathematical; in reality, Menger rediscovered the principles of calculus in his development of a subjective theory of value. His aim was a uniform theory of price which would explain price phenomena, interest, wages, and rent by one fundamental principle. (Preface p. x.; also, p. 143 n.)³⁷

³⁶Geschichte und Kritik der Kapitalszins-Theorien, 1884. (Tr. by W. Smart. Macmillan and Company, Inc., London, 1890).
Grundzüge der Theories des wirtschaften Güterwerts, 1886. (London School of Economics and Political Science Reprints of Scarce Tracts. No. 11, London, 1932).
Positive Theorie des Kapitaless, 1883. (Tr. by W. Smart. Macmillan and Company, Ltd., London, 1891.)

³⁷Von Hayek, F.A. Carl Menger. *Economica*, n.s.1:399. 1934. The material on Menger has been taken from secondary sources. Page references in parenthesis refer to pages in the original, *Grundsätze der Volkswirtschaftslehre*.

The subjective theory of value, fundamental to the whole analysis, proceeds from a careful investigation of the causal relationships between human needs and the means for their satisfaction. An object may become causally related (becomes a good) to a human want if four conditions are fulfilled: (1) A human want must be present; (2) The object must be capable of satisfying the want; (3) Man must recognize the want-satisfying characteristic of the good; (4) Man must have the object at his disposal (p. 3).³⁸ The want may be for material goods but also includes activities and non-material goods such as good will or patents. The fact that the want is irrational, or that lack of knowledge places a good not capable of satisfying the want in causal connection with it, does not invalidate the principle if the above conditions are fulfilled (pp. 4-5).³⁹

Resources may also possess the qualities of a good (pp. 8ff.).⁴⁰ Menger excludes from the sphere of economics those goods that either are not now at man's disposal or goods that are thought of as capable of being transformed into goods that the consumer could use. As did Jevons, he excludes those goods that have, in Jevonian terms, potential utility. To distinguish goods capable of directly satisfying wants

³⁸ Stigler, G. Studies in the history of theories of cost and distribution, 1870 to 1895. p. 106. Unpublished Thesis. Library, University of Chicago, Chicago, Illinois, 1938.

³⁹ Ibid. p. 107. ⁴⁰ Ibid. p. 107.

from resources Menger classified goods into "orders", based upon their nearness to the consumer.⁴¹ Although it was the application of his value principles to this "ordering" of goods that led to the outline of his distribution theory, in the development of subjective value theory, this classification was used only to render "insight into the causal relationships between goods and want satisfactions. (p. 10)"⁴²

Two concepts are fundamental to Menger's value theory: (1) Bedarf, the amount of each good required by an individual in order that he might completely satisfy his wants of any given time period; (2) Supply the available quantities of each good during the same time period. (pp. 45ff)⁴³ Menger states that human needs are capable of infinitely large demands over a period of time, but for any limited period one may assume the Bedarf to be a constant quantity. (p. 38)⁴⁴

The Bedarf and the supplies may be in one of three relationships: (1) They may be equal; (2) Supplies may be greater than requirements;

⁴¹ Bread would be a good of the first order, flour of the second, and wheat a third-order good.

⁴² Cited in Stigler, Op. cit. p. 108.

⁴³ Ibid. p. 109. Menger apparently recognized the fact that individuals plan their consumption for specific time periods, a concept quite generally overlooked by utility theorists.

⁴⁴ Ibid. p. 110.

(3) Requirements may exceed supplies. Given one of these three relationships the individual faces the problem of rationally allocating supplies among his requirements (pp. 51ff).⁴⁵ It is obvious that the first two relationships involved no particular difficulty. Equal demands for and supplies of goods will leave the individual at his maximum position for the time period. Excess of supplies over needs means that there is no necessity of considering the relative importance of different wants, supplies becoming non-economic or free goods.⁴⁶

The problem of rational allocation occurs when Bedarf exceeds supplies. "People will endeavor --- to secure the greatest possible result by the intelligent application of every given unit of the goods which stand in this quantitative relationship, and, similarly, to secure a given result with the least possible quantity of such goods ---. (pp. 52-53)"⁴⁷ Goods standing in this relationship are economic goods and will be allocated according to the above principle. Costs per se are irrelevant in determining whether or not the good is an economic or a free one (p. 61n).⁴⁸

⁴⁵ Ibid. p. 110.

⁴⁶ Menger gives credit to earlier German economists for the distinction between economic and free goods, particularly to Hermann who tried to base the distinction on the presence or absence of cost in terms of effort. (p. 70n)

⁴⁷ Stigler, Op. cit. p. 111.

⁴⁸ Ibid. p. 111. Note that in his analysis Menger relegates the explanation of the role of costs to a footnote.

In completing his subjective analysis, Menger considers the qualitative aspects of the relationship between goods and wants, the classification of wants according to their importance.

"If we have indicated correctly the nature of the value of goods, so that it is established that in the last resort only the satisfaction of our wants has significance for us and that all goods clearly secure their value by a transfer to them of this significance, then the differences in value of various goods, which we can observe in actual life, can be based only on the differences in the significance of those want-satisfactions which depend on disposal over these goods (p. 87)."⁴⁹

Not only do specific kinds of wants, and thus their satisfaction, differ in importance, but the satisfaction of a certain want will vary with the quantity of the good available (p. 90).⁵⁰

Menger illustrates the differing importance of various wants, and the decrease in the importance of the satisfaction as the quantity consumed increases, by the table duplicated in condensed form, in Figure 3.⁵¹

I	II	III	IV	• • •	X
10	9	8	7	• • •	1
9	8	7	--	• • •	0
8	7	--	1		
7	--	1	0		
--	1	0			
1	0				

Figure 3.

The columns I - X represent various kinds of wants, their importance

⁴⁹ Cited in Ibid. p. 112.

⁵⁰ Ibid. p. 112.

⁵¹ Menger, Op. cit. p. 95.

decreasing as we move from left to right. The number in any one column represents the added utility derived from the consumption of additional units of the good.

Man will attempt to maximize his position by equaling utilities at the margin." — The individual will endeavor --- to bring the satisfaction of his needs for tobacco and for means of sustenance into equilibrium (p. 94).⁵² It is this " --- weighing of the different importance of wants, the choice between that which remains unsatisfied and those, which according to the available means get satisfied, and the determination of the degree to which these latter wants get satisfied that is the most influential motive behind man's economic action (p. 94-95).⁵³

Although Menger states the principle governing the allocation of goods subject to different uses in a footnote the solution is correct.

"If a good is able to satisfy different types of wants --- the economic man will direct the quantity at his disposal first to the satisfaction of the most important wants regardless of what type they may be, and the remainder will be devoted to those concrete want-satisfactions which are next in importance, and so on with the filling of less important wants. --- All concrete wants are satisfied to the same level of significance (p. 98n).⁵⁴

⁵²Cited in Stigler, Op. cit. p. 113.

⁵³Ibid. p. 113.

⁵⁴Ibid. p. 114. This would be strictly true only if the good allocated is capable of satisfying all types of wants.

From the variations in the importance of wants Menger derived the principle for the value of a stock of goods. Assume Figure 3 represents an individual's wants; given ten units of a good, capable for satisfying all wants, the allocation would be as follows: Four units to want I, three units to want II, two units to want III, and one unit to want IV. The value of any unit would equal seven for "the value of a unit of the available stock of a good is for every individual equal to the significance of the least important want-satisfaction which is brought about by a unit of the quantity of the good (p. 99, also pp. 107-8)."⁵⁵

It is obvious that if the wants I - X in Figure 3 represent all desires of any individual, the only good capable of such allocation is general purchasing power. It is doubtful that Menger conceived of the problem in these terms. When he speaks of "according to available means" (p. 22) he may, however, be speaking in terms of the allocation of purchasing power rather than specific goods. As early utility economists assumed complete divisibility of goods, it would not be necessary for Menger, when speaking of allocating purchasing power, to formulate his principle in terms of equation of the marginal utilities divided by the respective prices per unit.

Although Menger speaks of value as if it were measurable, it is clear that he means that the value of a ^ccommodity may be expressed in

⁵⁵ Ibid. p. 114.

terms of another commodity of equal value. In using figures (such as in Figure 5) to represent scales of preferences they represent relative rather than absolute importance of the want - the numbers being of ordinal rather than of cardinal nature (p. 92).⁵⁶

Although Menger gave a clear notion as to the shape of the demand curve, the serious gap in his subjective theory was the omission of the role of costs in the determination of the relative value of various goods. It was Von Wieser who later developed the principle of opportunity costs: Other uses for a factor will limit the supply of factors to any one productive activity, so the value of the product will not, in the long run, fall below the sum of the value that its factors are able to receive in competing uses.

Menger, however, did recognize that subjective value alone was not a satisfactory explanation of price, but that it does explain the causes and limits of exchange between individuals.⁵⁷

⁵⁶P. Von Hayek, Op. cit. p. 401. This ordinal nature is implied in the use of the word Bedeutung.

⁵⁷Ibid. p. 402.

B. Leon Walras

Leon Walras was the third to make an independent discovery of marginal analysis, publishing his book⁵⁸ in 1874. Walras directed his attention to marginal analysis rather than subjective valuation and did not give any precise definition of the margin. Rather than extending the analysis to theories of labor, rent, and capital, Walras used the analysis as the foundation to a thorough exposition of a mathematical theory of exchange.

Walras uses the principle of satiability of desire as the explanation of the principle of marginal utility in the demand curve. In the development of his marginal utility doctrine Walras made a distinction between extensive and intensive utility. A commodity has extensive utility up to the point where, even if offered free, no greater quantity will be consumed; intensive utility is that which shows its influence in the shape of the demand curve. "We call the utility intensive because of the fact that the commodity responds to needs more or less intense and pressing, accordingly as, with a greater or smaller number of men, these needs persist, despite the height of the price, and persist more or less strongly with different men because, that is to say, the importance of the sacrifice to be made to procure the commodity has more or less influence upon the quantity of the commodity consumed (75)."⁵⁹

⁵⁸ Elements d' economie politique pure, Lausanne. Information on Walras is from secondary sources. Page references in parenthesis will be to this book.

⁵⁹ Cited in Davenport, H.J. Value and distribution. p. 335. University of Chicago Press, Chicago. 1908.

This reduces the demands of individuals for different goods to the common denominator of utility and, hence, the interpretation of the demand curve as an intensity-of-utility curve.

Basing his marginal utility analysis upon the assumption of existing and fixed supplies (eliminating cost influences) Walras reached the same conclusion as his two predecessors: the identification of market value with marginal utility.

Although Jevons made the same assumption as to fixed supplies, he did analyze the problem of the influence of cost on supplies. Walras, however, seemed to do no more than expose the problem. "In a word, it remains to decide whether it is the price of the productive resources that determines the price of the product, or rather the price of the product, determined as we have seen through the law of demand and supply, that determines the price of the productive resources, by virtue of the law of cost of production, the prix de revient. (p. 176).⁶⁰

Walras showed that the utility of a good expressed as a function of that good was only an approximation. Strictly speaking, the utility of a good depends upon the quantities of that and all other goods consumed. "I (Walras) soon perceived, however, that Cournot's demand curve, which depicted the quantity demanded as a function of price, was rigorously accurate only in the case of a market confined to two commodities. Where more than two commodities are involved in the exchange process, this demand curve is merely an approximation."⁶¹

⁶⁰ Ibid. p. 336.

⁶¹ Cited in Jaffee, W. Unpublished papers and letters of Leon Walras, Journal of Political Economy 43:155, 1935.

F. Alfred Marshall

Alfred Marshall's Principles of Economics,⁶² published in 1890, was an attempt to synthesize the Classical and Austrian doctrines. He believed that many of the concepts of the marginal utility analyses were implicit in Classical doctrines, especially Ricardian theory of value, and that subsequent writers, especially Jevons, "attributed to them Ricardo and Mills' doctrines narrower and less scientific than those which they really held."⁶³

Marshall felt that both the Classical and Austrian analyses explaining value were one sided - the Classical school because they lacked the necessary analytical tools, and Jevons and the Austrians because they desired to emphasize an aspect of value that heretofore had not been given its proper place in economic analysis.

Each doctrine, Marshall felt, was partially true; value being the resultant of both the effects of subjective valuation and the cost of production.

"We might reasonably dispute whether it is the upper or the under blade of a pair of scissors that cuts a piece of paper, as whether value is governed by utility or cost of production. It is true that when one blade is held still, and cutting is effected by moving the other, we may say with careless brevity that the cutting is done by the second, but the statement is not strictly

⁶²Macmillan and Company, Ltd., London. Marshall claims to have developed the marginal utility analysis independently. See Jaffee, *op. cit.* p. 202.

⁶³Marshall, A. *Principles of economics*, p. 814. Macmillan and Company, Ltd., London, 1927. This and all subsequent references are to the eighth edition.

accurate, and is to be excused only as long as it is claimed to be merely a popular and not a strictly scientific account of what happened.⁶⁴

In his attempts to combine the Classical and Austrian theories of value, Marshall gave the first systematic exposition of demand theory and its laws. In explaining the relationship between the price paid and utility received, he developed the controversial concept of consumer's surplus.

Marshallian demand theory is confined to consumer demand. He reasoned that "in the long run, the price which a trader or manufacturer can afford to pay for a thing depends on the price which consumers will pay for it --- the ultimate regulator of all demand is, therefore, consumer demand."⁶⁵ Utility analysis implies no hedonistic psychology for Marshall; utility is correlated only with desire or want. And, although there is no method of measuring utility, Marshall maintains that indirect measurement could be made by some outward phenomena. For purposes of economic analysis "the measure is found in the price which a person is willing to pay for the fulfillment or satisfaction of his desires."⁶⁶

⁶⁴Ibid. p. 348. For example, the supply of perishable goods in a market being relatively more inelastic than demand one could say demand governed value.

⁶⁵Ibid. p. 92. Note that the above gives the outlines of the Huttian concept of consumer's sovereignty.

⁶⁶Ibid.

Marshall also recognizes that many market decisions are based upon anticipations that are never realized. However, he assumes throughout his analysis that resulting satisfactions correspond fairly well to anticipations at the time of purchase.⁶⁷

Although an individual experiences an endless variety of wants, the tendency of human nature is to set a limit upon each want. The law of diminishing utility is an expression of this limit: "The total utility of a thing to anyone -- increases with every increase in his stock, but not as fast as his stock increases."⁶⁸ The increment of stock that an individual is just induced to purchase is the marginal purchase and its utility is the marginal utility of that increment to him.⁶⁹ The law of diminishing utility, therefore, may be stated as "the marginal utility of a thing to anyone diminishes with every increase in the amount of it he already has."⁷⁰ In generalizing the law one must assume "ceterius paribus" conditions and qualify the statement by "after a certain point."⁷¹ Marshall did not recognize that it is impossible to maintain "ceterius paribus" conditions in all cases, such as goods arising out of joint supply or having joint demands.

To translate the above law into price terms, the price paid for the unit a consumer is just induced becomes the marginal demand price. The law then becomes: "The larger the amount of a thing that a person has,

⁶⁷Ibid. p. 92n.

⁶⁸Ibid. p. 93.

⁶⁹Ibid.

⁷⁰Ibid.

⁷¹Ibid. p. 94, 94n.

the less, other things being equal ---, will be the price which he will pay for a little more of it; or in other words, his marginal demand price for it diminishes.⁷²

The same marginal demand price does not necessarily imply the same marginal utility to all consumers. The marginal utility of money is greater for the poor than for the rich. Identical price offers may represent different marginal utilities according to the amount of purchasing power at a person's disposal.⁷³ But "at one and the same time, a person's material resources being unchanged, the marginal utility of money to him is a fixed quantity."⁷⁴ Thus, in his partial equilibrium analysis Marshall assumes that the proportion of total income spent on the good under consideration is so small that the marginal utility of money may be regarded as constant.

A consumer's demand or the "amounts he is willing to purchase" can not be expressed meaningfully without reference to the prices he is willing to pay.⁷⁵ A more definite expression of this willingness is the demand schedule, the amounts an individual will purchase at all possible prices in any given situation. It is but an easy step to the graphical representation of this schedule as the familiar downward sloping demand curve.⁷⁶ Demand increases when an individual is willing to purchase the

⁷²Ibid., p. 95. ⁷³Ibid., pp. 95-96. ⁷⁴Ibid., p. 95. ⁷⁵Ibid., p. 97

⁷⁶Although he confined his graphical presentations to footnotes, Marshall did much to further this method of presentation.

same amount, given an increase in all prices in the schedule, rather than the fact that the quantity taken increases with a fall in price.⁷⁷

Individual demand is not continuous; it does not change by the minute variations that the demand curve would indicate. If, however, individual demands are added together to arrive at market demand "the variety and fickleness of individual action are merged in the comparatively regular aggregate of the actions of many."⁷⁸

The preceding analysis brings Marshall to his universal law of demand: "The greater the amount to be sold, the smaller must be the price at which it is offered in order that it may find purchasers; or, in other words, the amount demanded increases with a fall in price, and diminishes with a rise in price."⁷⁹ The price paid will be a measure of the marginal utility of the good to each individual but it is impossible to make interpersonal comparisons regarding this amount of utility.⁸⁰

Although, with increasing supplies, a person's desire for a commodity decreases, other things being equal, the rate of diminution may be slow or rapid. This responsiveness of quantity taken to price changes is the concept of elasticity of demand.⁸¹ The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded

⁷⁷Marshall, A., Op. cit., p. 97. Graphically an increase in demand is represented by a shifting of the whole demand curve to the right. It may or may not involve a shift in the shape of the curve.

⁷⁸Ibid., p. 98. ⁷⁹Ibid., p. 99. ⁸⁰Ibid., p. 100.

⁸¹The concept was first developed by Cournot. See *Recherches sur les principes mathématiques*, 1838. (Tr. by N. Bacon, Macmillan and Company, New York, 1927).

increases much or little for a given fall in price, and diminishes much or little for a given rise in price.⁸² The demand for necessities and perishables is less elastic than for goods regarded as luxuries or goods subject to many different uses.⁸³

To gain maximum satisfaction an individual must allocate a good subject to alternative uses in such a way that the last unit applied in each use will have the same marginal utility. For if a unit "had a greater marginal utility in one use than another, he would gain by taking away some of it from the second use [that with less marginal utility] and apply it to the first."⁸⁴ But maximum satisfaction may not be gained for the goods held may not satisfy some wants. Barter is a partial remedy but "there is an urgent need for the free use of money, --- for that alone can be applied easily in an unlimited variety of purchases."⁸⁵ Given general purchasing power, an individual will gain maximum satisfaction" when the marginal utility of a shilling's worth of goods on each line shall be the same."⁸⁶

The uses to which goods or money are to be allocated may not all occur in the present. The principle covering the allocation of goods subject to present and future uses is the same stated above. The quantities

⁸² Marshall, A. Op. cit. p. 102. The concept is stated more precisely in the Mathematical Appendix, p. 339.

⁸³Ibid. pp. 106-8. ⁸⁴Ibid. pp. 117-18.

⁸⁵Ibid. p. 118. It was this point that Jevons and Menger failed to realize.

⁸⁶Ibid.

allocated to future uses will be smaller than those to present uses because of (1) the uncertainty of future events, and (2) subjectively future events are less pleasurable than present ones.⁸⁷

In analyzing the relationships between price paid for and benefit derived from a good, Marshall develops the concept of consumer's surplus.⁸⁸ The economic measure of this surplus is "the excess of the price which he would be willing to pay rather than go without the thing, over that which he actually does pay."⁸⁹ Although the idea of a surplus of satisfaction may seem unreal, what it really means is that "we cannot trust the marginal utility of a commodity to indicate its total utility."⁹⁰

The application of this concept as a tool of welfare economics can only be applied with ^wtoo qualifying assumptions: (1) that abilities to appreciate are equal on the part of all concerned, and (2) that the marginal utility of money is constant. Marshall felt that exceptions to the latter case are rare and that these exceptions could be treated on their own merit.⁹¹

⁸⁷Ibid. p. 119.

⁸⁸Dupuit, in 1844, first developed the concept. It appears in M. de Bernard's reprint of Dupuit's "De l'utilité et de sa mesure" (Turin, 1933).

⁸⁹Ibid. p. 124. ⁹⁰Ibid. p. 129.

⁹¹Ibid. pp. 130-32. In these latter cases the income effects would be strong. Here, in stating the famous Giffen case concerning inferior goods, Marshall recognized that the universality of his law of demand is sometimes violated.

Marshall's theory of demand was not only more systematic than earlier attempts but superior in some respects. Most notable was a clear conception of how an individual does actually attempt to maximize his satisfactions. The principle of allocating goods among various uses to gain maximum satisfaction is a reasonable explanation only when the allocation is in terms of general purchasing power. When confined to goods possessed the principle explains actions of people in an economy where no barter or exchange is possible.

Marshall, however, did simplify his demand theory by assuming that the marginal utility of money is constant. In partial equilibrium analysis it is a reasonable assumption that the portion of income spent on any one good is so small that the effect upon the marginal utility of money is negligible and that for analytical purposes, it may be thought of as constant.

In demand theory this assumption does not drastically distort the picture. It eliminates from the law of demand those cases where the income effect of a price change is so great that an increase in price results in increased consumption of that good. This exception, as we shall see⁹² occurs in but rare instances.

In welfare economics, however, Marshall's simplifying assumptions have broader implications. In disposing of objections to the measurement of welfare in price terms Marshall says, "On the whole, however, it happens that by far the greater number of events with which economics

⁹² *Infra*, p. 43.

deals affect in about equal proportions all the different classes of society; so that if the money measures of happiness caused by two events are equal, there is not in general any very great difference between the amounts of happiness in the two cases.⁹⁵ Thus in the application of economic analysis to social policy the effects of differing abilities to appreciate and inequalities in the distribution of income are eliminated. Many of our social policies, e.g., taxation, relief, government expenditures, etc., can be understood only in light of the above precepts. To eliminate these considerations is to retain under false pretenses, scientific analysis in dealing with problems of social welfare.

⁹⁵ Marshall, Op. cit. p. 151.

6. Vilfredo Pareto

Although Pareto started with the same utility theory as did Marshall, successive publications found him making new and fundamental contributions to the theory of demand.⁹⁴ For Pareto, economics was a study of the relationships between tastes and obstacles, the more obvious obstacles being the wants of others, limitations in supplies, and cost of production which consists of sacrificing some commodities to get others. The purpose of his work was pure analysis; and within the analysis subjective facts are adapted to objective facts by observing repeated actions where mistakes have been eliminated through experience.

In Cours d'économie politique⁹⁵ Pareto treated utility as a measurable quantity and assumed independent utility functions for each good. In Manuale di economia politica⁹⁶ utility was an immeasurable concept, represented by some arbitrary function; and the utility function for a good was dependent upon the functions for all other goods. It was the adoption of Edgeworthian indifference-curve technique that led Pareto to make advances over the value theory of his predecessors.

⁹⁴I am indebted to Professor Eugene Altschul of the University of Minnesota for access to unpublished material on Pareto used in his seminar, Mathematical Economics. For this reason, the following pages are undocumented.

⁹⁵P. Rouge, Lausanne. 1896.

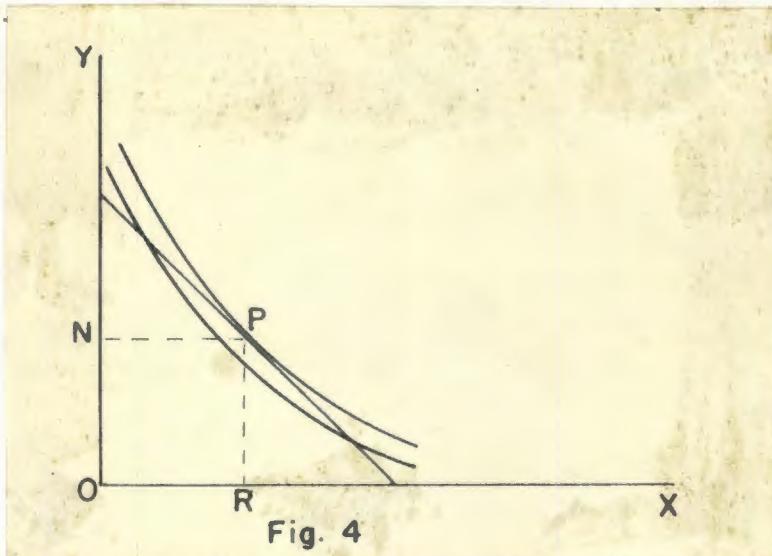
⁹⁶Milano. 1906.

Departing from Marshallian procedure, Pareto dealt with the problem of related goods, falling back on the work of Edgeworth.⁸⁷ An indifference-curve is a loci of points representing combinations of quantities of goods between which the individual has no preference. Starting with a certain combination of commodities X and Y the individual will gain a certain satisfaction designated as U, although no attempt is made to measure U. Taking away one unit of X we can vary the amount of Y until the resulting combination is as equally satisfactory as first. By other similar variations any number of such combinations may be determined, and to each we may assign the utility index U.

Plotting these points and joining them with a smooth curve we have an indifference-curve. Starting with combinations containing larger or smaller quantities of each good than did the original combination, we can trace out a series of such curves, some to the right and others to the left of our original curve. This series of curves makes an indifference map. The question is, how will the consumer, with tastes represented by the indifference map, and with given prices and income, distribute his income between X and Y? We can tell the amounts he will buy from his indifference

⁸⁷ Edgeworth stated that utility is a function of the quantities of all goods consumed and not of the quantity of the particular good under consideration. His analysis was based upon the assumption of measurable utility. *Mathematical Psychics*, 1881. (London School of Economics and Political Science Reprints of Source Tracts, No. 10, 1932).

map without knowing the utility he derives from the goods.



In Figure 4 we have the indifference map for two commodities, X and Y. Any point on the line ML represents the quantities of each good he could buy with present prices and income. The price-ratio is indicated by the slope of the line. At the point of tangency (P), the slope of the price line and of the indifference curve are equal; the subjective ratio of preference equals the objective market exchange ratio; or the relative marginal utilities are proportional to prices. Thus P is the equilibrium point, the individual having OR of X and ON of Y.⁹⁸

Pareto, however, does not use the term utility because: (1) it has a different meaning in popular usage and it, therefore, is open to misunderstandings; (2) it is too easily considered in absolute terms.

⁹⁸ Irving Fisher in his Doctoral Thesis at Yale University (1891) anticipated Paretoian developments. He attempted to put Edgeworthian utility analysis on assumptions other than measurable utility. He did not, however, indicate the implications such an analysis would have for demand theory. See Fisher, I. Mathematical Investigation in the Theory of Value and Prices. Part II. Yale University Press, New Haven. 1926.

Pareto, therefore, substituted the word "ophelimity," which is derived from the Greek word meaning pleasure.

Although the net effect of Pareto's contribution to demand theory is to strengthen the already well-founded belief in the negative inclination of the demand curve, Paretian analysis has several advantages. First, it is not based on any psycho-physical law as is the principle of diminishing utility. Value theory is independent of psychology; assumptions regarding economic behavior are derived experimentally through observation of repeated actions. Second, it is unnecessary to assume a measurable utility function. Third, Paretian general equilibrium analysis, by taking into account the interdependence of utility functions, and therefore demand, brings us closer to reality.

"One must not confuse the general proposition obtained for the case where the price of a commodity depends on all the quantities exchanged and vice versa --- with the apparently similar propositions obtained when the assumption is made that the price of a commodity depends solely on the quantity of that commodity bought or sold. A table in which there is listed in one place the price of a commodity and in another the quantity which an individual will buy or sell, without taking into account other commodities does not correspond to reality; it is simply a hypothetical case. (p. 587)"⁹⁹

⁹⁹Cited in Schultz, H. Theory and measurement of demand. p. 50. University of Chicago Press, Chicago. 1938.

H. J.R. Hicks

Hicks in Value and Capital¹⁰⁰ builds his consumer demand theory out of Paretian developments.¹⁰¹ The analysis eliminates the subjective elements from demand theory, assuming a given scale of preferences, rather than a given intensity of desire, for a collection of goods. The concept of marginal utility is replaced by the concept of marginal rate of substitution. "We may define the marginal rate of substitution of X for Y as the quantity of Y which would just compensate the consumer for the loss of a marginal unit of X."¹⁰² Diminishing marginal rate of substitution replaces diminishing utility.¹⁰³

Hicksian analysis of consumer demand deals with the effect of a change in the price of one good, other prices remaining constant, upon the demand for (1) the good in question, and (2) the demand for all other

¹⁰⁰Clarendon Press, Oxford. 1939.

¹⁰¹In *Giornale degli Economisti* (1915) Professor Slutsky published a paper, "Sulla teoria del bilancio del consumatore." It was the first work taking advantage of Paretian developments. It was discovered in 1934 by Hicks and Allen and Henry Schultz after the former two had first published their work, *A Reconsideration of the Theory of Value*, *Economica*, n.s.1:52-76, 1934. Slutsky's work is more limited, his theory is expressed in terms of one selected utility function. See Allen, R.G.D. Professor Slutsky's Theory of Choice, *Review of Economic Studies*, 5:120-129, 1935-36.

¹⁰²Hicks, J.R. *Value and capital*. p. 20. Clarendon Press, London. 1939.

¹⁰³The reasoning underlying the use of diminishing marginal rate of substitution is the same as that for using diminishing marginal utility: there must be some determinate equilibrium point.

goods.¹⁰⁴ Within each sphere the change in demand will be the resultant of two separate effects. (1) The change in the relative prices of goods will cause a substitution effect in favor of goods that become relatively less expensive. (2) The real income of the consumer will be increased or decreased, depending upon the direction of the price change, increasing or decreasing total quantities demanded.¹⁰⁵

It was the income effect that Marshall's constant marginal utility of money eliminated from his demand theory. Marshall recognised that income effects might be important in the case of inferior goods,¹⁰⁶ but because this case was the exception felt justified in omitting income effects in his main analysis.

In considering the change in demand for the good whose price has fallen the substitution effect will cause increased demand. As the elasticity of substitution among commodities is never completely inelastic, there will be a "tendency to substitute the commodity where price has fallen for other commodities."¹⁰⁷ The income effect will depend upon

¹⁰⁴ Keeping other prices constant allows Hicks to plot one good against money in an indifference system. As long as prices of all other goods remain constant they can be lumped together into one commodity, "money" or "general purchasing power".

¹⁰⁵ Hicks, J.R., Op. cit. pp. 31-32.

¹⁰⁶ See Marshall, Op. cit. p. 132.

¹⁰⁷ Hicks, J.R., Op. cit. p. 32.

the proportion of the consumer's income allocated to the good before the price change."---- if that amount was large relatively to his income, he would be made much better off, and the first effect income ---- would be very important; but if the amount was small, the gain was small, and the income effect was likely to be swamped by the substitution effect.¹⁰⁸ The income effect will allow increased consumption of the particular good, all other goods, or both.

The certainty of the operation of these two effects is not the same.

"It follows from the principle of diminishing marginal rate of substitution that the substitution effect is absolutely certain - it must always work in favor of an increase in the demand for the commodity when the price of that commodity falls. But the income effect is not so reliable; ordinarily it will work the same way, but it will work in the opposite way in the case of inferior goods."¹⁰⁹

Unless the consumer is allocating a large share of his income to the inferior good the substitution effect will overshadow the former effect because "the total effect on demand is the sum of these two tendencies."¹¹⁰

The transition to market demand for the good involves no particular problem. "Market demand has almost exactly the same properties as individual demand. ---- The change in the demand of a group is the sum of changes in individual demand; it is, therefore, divisible into two parts, one corresponding to the sum of the individual income effects, the other to the sum of individual substitution effects."¹¹¹

¹⁰⁸Ibid. ¹⁰⁹Ibid. ¹¹⁰Ibid. ¹¹¹Ibid. p. 34.

The substitution effect will tend toward increased demand as each individual demand has the same tendency when the price falls. The income effect is not subject to generalization. For consumers to whom the good is superior the income effect will increase demand; for those who regard the good as inferior the income effect will tend to decrease demand.¹¹² The total income effect, even though negative, may not have any appreciable effect upon the total demand change. "The group income effect will be negligible if the group as a whole spends a small proportion of its total income upon the commodity in question."¹¹³

Thus the demand curve for any good will slope downward and to the right unless two conditions exist: The good must be inferior for the people who consume the major share of the good. (2) The group must be spending a large share of their total income upon the commodity." Thus, as we may expect, the simple law of demand - the downward slope of the demand curve - turns out to be almost infallible in its workings. Exceptions to it are rare and unimportant."¹¹⁴

The total effect upon the demand for all other goods will depend upon the nature of the price elasticity of demand for the good whose price has decreased. The substitution effect will tend to diminish the demand for other goods; the income effect will increase it.¹¹⁵ The final result will be the summation of these positive and negative quantities.

¹¹²Ibid.

¹¹³Ibid. pp. 34-35.

¹¹⁴Ibid. p. 35.

¹¹⁵Ibid. p. 48.

Although the group of all other goods, as a whole, will react in the above manner, a particular good within the group may deviate from the pattern. The demand for any particular good will depend upon its relation to the good whose price has fallen. Goods may be related as substitutes or complements.¹¹⁶ Hicksian analysis covers several special cases: the good being highly complementary, mildly so, mildly substitutable, and highly substitutable.¹¹⁷ Generally, the effect upon the demand for a good, Y, within the "all other goods" class will be that "the substitution effect will diminish it [the demand] unless Y is complementary with X the good whose price has fallen; the income effect will increase it unless Y is an inferior good."¹¹⁸ Hicks feels that there are no commodities that are entirely independent of price movements in other goods. In cases where this independence seems to exist it is most likely that one of two things occurred: (1) The total effects may be so small that they are negligible. (2) The separate income and substitution effect may be substantial but that they do in opposite directions, cancelling out and leaving no net effect upon demand.¹¹⁹

Hicks attempts to clarify the Marshallian concept of consumer sovereignty, for he feels that the qualification that limits its usefulness

¹¹⁶Y is a substitute for X if the marginal rate of substitution of Y for money is decreased when X is substituted for money. Y is a complement of X if the marginal rate of substitution of Y for money increases when X is substituted for money. See Hicks, Op. cit. p. 44.

¹¹⁷Hicks, J.R., Op. cit. pp. 48ff.

¹¹⁸Ibid. p. 48. ¹¹⁹Ibid. p. 49.

may be overcome. The assumption of constant marginal utility of money gave Marshall's concept the refinement that Dupuit's lacked.¹²⁰

In Figure 5¹²¹ consumer's surplus is represented by the line RP. From the indifference map one sees that an individual would be equally satisfied with OM income or ON of good X, giving up FR to purchase it. Given the market price of X (represented by the line ML) the consumer finds it necessary to give up but FP of his income to possess ON of X commodity, thereby placing the consumer on an higher indifference curve. Thus the excess of what he would pay (FR) over the price he actually pays (FP) is equal to PR.

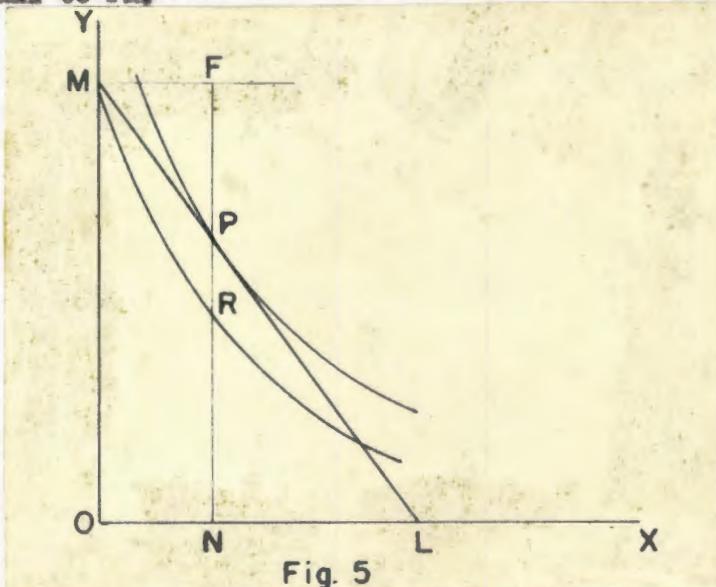


Fig. 5

There is no assumption as to the constancy of the marginal utility of money in the above analysis. It is, however, only with that

¹²⁰Marshall, of course, clearly recognized the limitations that this assumption gave to his concept. See Marshall, A. Op. cit. p. 132.

¹²¹Hicks, J.R. Op. cit. p. 39.

assumption¹²² that the line RF would equal the Marshallian area (representing consumer's surplus) enclosed by the demand curve, the Y axis, and a line parallel to the X axis at the price at which the quantity OW would be demanded.

Marshall's presentation is valid in all cases where income effects may be neglected. "Marshall neglects the difference between the slope of the indifference curve at P and the slope of the indifference curve at R."¹²³ The income effects assume importance only in rare cases, • "but the difference may still be important, even if the proportion of income spent on the commodity is small, it will be important, if RP itself is large, if the consumer's surplus is large, so that the loss of the opportunity of buying the commodity is equivalent to a large loss of income."¹²⁴

Hicksian consumer's surplus is a means of expressing in money terms gains to the consumer as a result of price decreases. "It is the compensating variation in income, whose loss would just offset the fall in price, and leave the consumer no better off than before."¹²⁵

"Now it can be shown that this compensating variation cannot be less than a certain minimum amount, and will ordinarily be greater than that amount."¹²⁶ The minimum loss will be that amount which will allow

¹²²In terms of indifference curves, constant marginal utility of money would mean that the slopes of the indifference curves at R and P would be equal.

¹²³Hicks, J.R. Op. cit. p. 40.

¹²⁴Ibid. ¹²⁵Ibid. pp. 40-41. ¹²⁶Ibid. p. 41.

the consumer to buy the same quantities of all commodities as before the price change. As the relative price structure is changed by the price change, the consumer may be able to better his position, even with the loss in income, by substituting the now relatively cheaper good for other commodities.

Without the limitations imposed by assumption of constant marginal utility of money, consumer's surplus, in terms of compensating variations, should be useful in evaluating social policy.¹²⁷

Dr. Adolf Kozlik of Iowa State College, in an unpublished manuscript, has shown that the concept of compensating variation has two possible interpretations, and in neither case is it necessarily identified with consumer's surplus. The indifference map used in the analysis is duplicated in Figure 6.

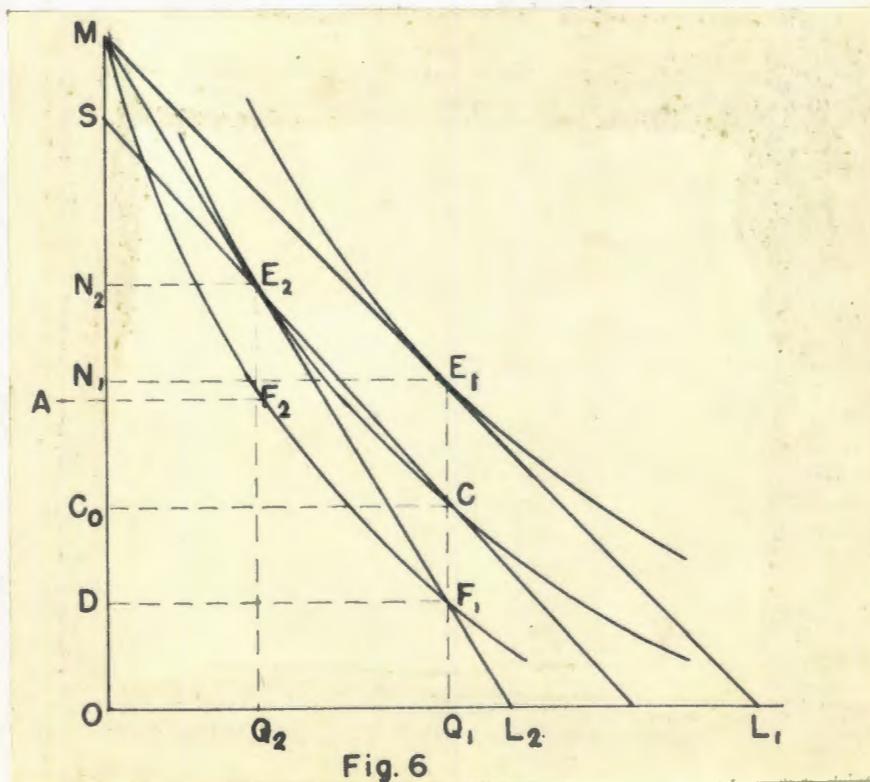


Fig. 6

¹²⁷For application of concept to tax theory, see Ibid. p. 41.

The consumer has OM money and under the price of good X (OM/OL_2) the equilibrium point is E_2 , the consumer buying OQ_2 of X and keeping ON_2 money. If the price of X is reduced (OM/OL_1) the consumer will move to E_1 , attaining a higher indifference curve (II). The Hicksian compensating variation is the reduction in OM that, under the price OM/OL_1 , will leave the consumer on the original indifference curve (I).

If the consumer purchased OQ_1 of X the compensating variation will be $E_1C = MS$. This Dr. Koslik calls the post-variation. If, however, the reduction is made before OQ_1 of X is purchased, the consumer is able to move to the left along SC (unless X is an inferior good) to an indifference curve higher than curve I. This Mr. Koslik calls the ante-variation. Here the compensating variation must be greater than in post-variation.

Dr. Koslik measures consumer's surplus by drawing an indifference curve (∞) through M , corresponding to the level of satisfaction attained if the consumer could buy no X. The curve shows for each quantity of X the largest amount he could pay for them and be as well off as if he could buy no X. With the price of X at OM/OL_2 the surplus is $E_2F_2 - N_2A$, with the price OM/OL_1 the surplus is $E_1F_1 - N_1D$. The increment of surplus (consumer's surplus) is $E_1F_1 - E_2F_2$ or $N_1D - N_2A$.

Consumer's surplus of $E_1F_1 - E_2F_2$ is defined under the assumptions underlying the post-variation, that the quantity OQ_1 is purchased. However, the two would be equal only when $CF_1 = E_2F_2$. This would be true if the slopes of the curve I and curve ∞ were equal for all quantities of X. This would imply that the marginal utility of money is a constant

or that commodity X is on the borderline between an inferior and superior good. Only under one of these conditions, would points A and C₀ coincide making post-variation, ante-variation and consumer's surplus identical.

Hicksian analysis builds a theory of demand, as thorough as Marshallian theory, upon the assumption of a scale of preferences, rather than a given utility function. All concepts finding their basis in the assumption of measurable utility are eliminated, and concepts consistent with the objective basis of the theory are substituted.

Nor does Hicks take advantage of the simplifying device used by Marshall - that of constant marginal utility of money. The explicit incorporation of income effects in his theory does not allow Hicks to make the same statement as to the universality of the law of a downward sloping demand curve. But, like Marshall, he realizes that exceptions to the rule are rare.

Although the net effect is to confirm the already sound Marshallian conclusions, the analysis is more systematic. Holding the prices of all goods except one constant,¹²⁸ Hicks shows that the resulting increased demand for the good whose price has fallen is the result of two forces: the income and substitution effect, and necessary conditions for the exception to the law of demand are outlined.¹²⁹

¹²⁸Holding the prices of all other goods constant is not quite the same as assuming *ceterius paribus* conditions. It involves the problem of what level of constancy to maintain. The demand curve for beef will vary according to whether pork is held constant at twenty or thirty cents per pound.

¹²⁹Hicks, J.R., Op. cit. p. 35.

The analysis goes beyond Marshallian limits by (1) showing the probable effect of the price decrease upon the demand for any particular commodity within the "all other goods" classification. This effect will depend upon the relationship of the good to the good whose price has fallen. (2) The analytical apparatus makes possible the study of changes in income as well as changes in price.¹³⁰

¹³⁰ Further comments on Hicksian demand theory will appear in Part II.

I. Conclusion

The acceptance of the marginal utility concept as the force that would revolutionize economic analysis was neither immediate nor universal. Philip Wicksteed, writing forty years after the discovery of the concept, states:

"This principle [marginal utility] furnishes the clue to all the most intricate problems of the abstract theory of Political Economy; and I believe the reconstruction contemplated by Jevons has been carried to a far more advanced point than is generally recognized even by those who are themselves accomplishing it. Adhesion to the traditional terminology, methods of arrangement, and classification, has disguised the revolution that has taken place. The new temple, so to speak, has been built up behind old walls, and the shell has been so piously preserved and respected that the very builders have often supposed themselves to be merely repairing and strengthening the ancient works and are hardly aware of the extent to which they have raised an independent edifice."¹³¹

In Germany the utility approach, as well as its deductive method, was opposed by the historical school.¹³² The French accepted the utility approach more readily, although Walras' mathematical treatment was ignored. It was the Italians, Pantaleoni and Pareto, who advanced Walrasian techniques. J.B. Clark first popularized the utility

¹³¹Wicksteed, P. Common sense of political economy, Vol. I, p. 2. George Routledge and Sons, Ltd., London, 1934.

¹³²Carl Menger's second great book was an attempt to justify and to make clear the peculiar nature of the scientific method in the social sciences. Untersuchungen über die Methode der Socialwissenschaften und der politischen Oekonomie insbesondere. Verlag Von Duncker and Humblat, Leipzig. 1883. (London School of Economics and Political Science Reprints of Scarce Tracts No. 18, 1933).

approach in the United States, followed by Fisher, Fetter, and Patten.

Alfred Marshall, however, was mainly responsible for the acceptance of a modified utility approach in economic analysis. Because of his admiration of and respect for Classical doctrines, it is in the economics of Marshall and his followers that we find "the traditional terminology" and the "pious preservation of the old shell."

For Marshall and his followers the utility theory was a logical extension of Classical doctrine which would strengthen some aspects of it and be unnecessary to others. But for the Austrians, Jevons, and Wicksteed "the able but wrong-headed David Ricardo" had "shunted the car of Economic Science onto a wrong line, a line on which it was further urged toward more confusion by his equally able and wrong-headed admirer John Stuart Mill."

The difference between the two schools was essentially that of differences in emphasis as to the relevancy of psychological comparisons in the determination in any equilibrium. For Marshallians the marginal utility concept would explain the negative inclination of the demand curve but a much refined Ricardian real cost analysis was the basis of their theories of value and distribution. Costs, they believed, were independent of utility analysis. Marginal utility analysis reached its height in their welfare economics and "surplus" concepts.

The Austrians and their followers made the marginal utility analysis the foundation of the "new edifice." The whole of economic equilibrium could be rebuilt starting with the theory of exchange and extending out into production and distribution theories. Market prices were the result

of the interplay of individual choices, and costs but a reflex of this choice - the valuation of alternative opportunities. For the Austrians costs and distribution were considered as part of one general valuation problem; marginal utility being the sole basis of explanation.

Within the field of price economics the beliefs of the Marshallians were justified. The Classical cost-of-production value theory assumed the operation of the utility principle, and Ricardo and his followers were aware of the role of demand. As well, the utility theorists, especially Jevons, recognized the indirect effect of costs upon utility.¹³³ Even though they recognized this indirect influence, marginal utility was held to be the sole determinant of price. Jevons, Walras, and the Austrians ignored or rejected psychological disutilities as a price determinant, and money costs of production were derivatives of the demand for the final product.

The utility theorists were no nearer the truth in the formulation of price laws than were the Classicists. Producers choose the most profitable activity and the amount produced in relation to demand fixed the price. As Menger pointed out, historical costs are irrelevant in price determination¹³⁴ but it is only in the very short run, when the supply in any market is inelastic, that we can ignore costs as a price-

¹³³Cost of production determines supply; supply determines final degree of utility; final degree of utility determines value. Jevons, W.S. Op. cit. (2nd ed.), p. 179.

¹³⁴The subjective theory of value focuses attention upon the fact that once a chance has occurred what happened before is irrelevant. The problem is one of adjustments to the given situation.

determinant. In the long run costs are of at least coordinate importance; and in the case of constant costs are completely dominant, utility determining only the amount produced.¹³⁵

Utility theory did overcome the paradox of differing value-in-use and value-in-exchange; provided an adequate explanation of the downward sloping demand curve; and helped in the understanding of the causes and types of interrelationships existing between the prices of various goods. Although the utility theorists were not completely correct in the formulation of price laws, it was in the period of the 1870's that we found the beginnings of demand theory.

¹³⁵ Constant costs for most productive activity are realistic only in the very long run where there is time for restraining of labor, changes in the form of capital, etc.

II. FURTHER DEVELOPMENTS IN DEMAND THEORY

A. Introduction of Time into Demand Theory

Time has three distinct roles in economic analysis. First, we have time as an economic good subject to careful allocation. Second, time may be viewed as the length of time for which economic actions are planned. Third, time may be considered as an element in the process of change.¹³⁶ Hicksian analysis of consumer demand introduces the process of change. His method of analysis, comparative statics, ignores time as an element in the process of change. We can introduce this element but first we must consider the assumptions underlying the analysis.

Demand theory traditionally has been in terms of full, long run equilibrium, explaining the end positions and neglecting the important intermediate positions. Mr. Hicks' comparative statics follows this tradition. Starting from an equilibrium position, Hicks applies the tools of static analysis to successive time periods within which changes in the data occur. Comparing the results of each static analysis, we see the process of change in consumer demand when adapting actions to changes in the givens, e.g., changes in the relative price structure.

¹³⁶See Rosenstein-Rodan, P.N. The role of time in economic theory. *Economica*, n.s., 1, 77-97, 1934.

As in the usual analysis, Hicks assumes that consumers, when acting rationally, attempt to achieve the maximum satisfaction position, given available resources and their scale of preferences. With a change in the "givens" the consumer moves (1) from the equilibrium position as defined by static analysis to the equilibrium position indicated by static analysis of the new set of "givens" and (2) that this change is made directly.

These two features of Hicksian dynamics follow logically from the assumptions underlying the analysis: (1) Scales of preferences remain unchanged for the period studied. (2) Resources are fully variable. (3) Psychic frictions are not present. (4) Perfect knowledge.

Although the analysis is "dynamic" in that it compares different situations and focuses on the process of change, it is justifiable to assume that scales of preferences are constant. For analytical purposes the only way that we can picture the effects and results of certain phenomena is the assumption that there are some things that we can take as constants. If we assume that all phenomena change continuously the cause of economic analysis is lost. One of the most realistic assumptions, in the writer's opinion, is that of a constant scale of preferences. It is not, of course, valid for an indefinite period that might bring drastic changes. It does seem that tastes which are acquired through years of experience and experiment are the least likely to change

with every small change in the rest of the phenomena.¹³⁷

The other three assumptions are carried over from static analysis. Each assumption is valid within each temporary equilibrium, but when the series is to be viewed as a process of change the assumptions take on new meanings. Unless these modifications are taken into account the picture of the process of change may be distorted. If we do not wish to incorporate these effects into the analysis we must realize how this action affects our results.

In this regard the most important assumption is that of the degree of variability present in the resources with which the consumer faces the market. Static analysis assumes that all resources are capable of full variation. As the early utility theorists were not too precise in showing how the individual actually attained his maximum position, we must turn to Marshall for confirmation of this assumption. Marshall makes no explicit reference to the degree of variability but it is implicitly assumed when he speaks of the method of allocating purchasing power among its various uses. "And this result [maximum satisfaction] each one will attain by constantly watching to see whether there is anything on which he is spending so much that he would gain by taking a little away from that line of expenditure and putting it on some other line."¹³⁸

¹³⁷Many consumers try to keep their tastes the same. One hears the story of the hillbilly who, on his first trip to town, saw a new fruit and asked what it was. "Bananas," was the reply, "want to try one," "No," said the hillbilly, "I want more than I can buy now. Why try somethin' new?"

¹³⁸Marshall, A. Op. cit. p. 118.

In Hicksian comparative statics this assumption means not only that resources are fully variable for the original allocation but that once allocated they are so invested that it is possible to liquidate and reallocate these resources, if a change in the "givens" should dictate such a procedure.

In a process of change psychic frictions occur when the consumer, with full knowledge, fails to adjust continually to changes in the givens, e.g., changes in the relative price structure. The lack of such frictions implies that the time interval between changes in the price structure is of such length that the consumer has time to reallocate his resources and reach his maximum satisfaction position for every change encountered. In other words, the consumer has the time and energy to reweigh alternatives, break old expenditure patterns, and form new ones.

Hicksian analysis fails to consider the possibility that the time intervals between changes may be of such short duration that the consumer fails to reach the possible maximum, under the given conditions, because reallocation of his resources has not been completed.

Again, in comparative statics the assumption of perfect knowledge takes on additional meaning. In static analysis perfect knowledge implies that the consumer knows the nature of the "givens" at that particular time, e.g., prices. In Hicksian comparative statics, however, it implies that the consumer not only knows present prices but that future price changes are anticipated perfectly. Thus there is no

necessity of including the effects of false anticipations in the theoretical structure. This assumption has further implications in dynamics. It implies that all changes occurring in the givens are immediately transferred and assimilated by the consumer. It precludes the possibility of consumers failing to adjust to the new set of givens because of ignorance of the change.

We may see how fundamental these three assumptions are to Hicksian comparative statics by following a similar analysis without (1) the assumption of full variability, (2) without perfect knowledge with respect to changes in price, and (3) the presence of psychic frictions. Ignoring new wants, so that we can work from one indifference map, let us analyze the effects of a change in the price of a commodity on the nature of the process of change from one maximum position to another.

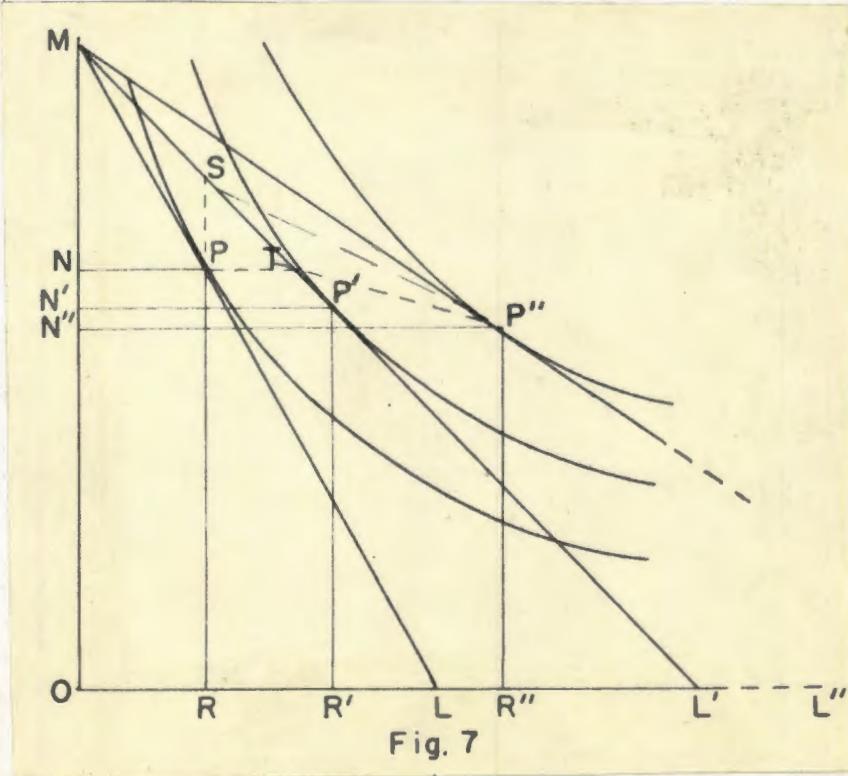


Figure 7¹³⁹ shows the familiar diagrammatic representation of the indifference of a consumer between combinations of any good X, on the horizontal axis, and money (all other goods) on the vertical axis. In period I, with the price of X equal to OM/OL, the equilibrium position is indicated by P. The consumer gives up MN of his money for OR of good X and retains ON of his total income. In period II the price of X decreases (indicated by OM/OL¹). With this price change the equilibrium position is indicated by P¹. To achieve this equilibrium the consumer will increase the quantity of X purchased by RR¹ and reduce the amount of money retained by MM¹. In Hicksian analysis the consumer moves directly from P to P¹ (indicated by the unbroken line connecting P to P¹). Following Hicksian terminology we shall call this the price-consumption curve.¹⁴⁰

Eliminating the assumption of full variability of factors, let us assume that in period I attaining equilibrium involved allocating all remaining money (ON) to commitments (contract for room, installment purchases, insurance payments, etc.). In period II then, and this is the crucial point, the available income to be reallocated is not OM as it was in period I but is that portion of OM that is free of

¹³⁹The line PSP¹ in Figure 7 probably would not coincide with the line PTP¹ from I to P¹. It is so drawn to simplify the presentation.

¹⁴⁰Op. cit. pp. 30-31.

commitments (MN). Under these conditions it would be impossible to move to P^1 , as the additional income (NN^1) that must be allocated to the purchase of additional X is "sunk" in non-liquid investments.

The consumer, however, can buy a greater quantity of X in period II. This action will leave him on an indifference curve further to the right (one of higher satisfaction) than in period I. He might purchase only the same quantity of X but, due to the convexity of the curves, this would mean less satisfaction than the former alternative would give. The consumer will move along an extension of the line NP to an indifference curve going through the point T . If the price conditions of period II remain constant until a portion of ON equal to NN^1 becomes liquid the equilibrium position P^1 may be reached. The path that the consumer follows will be indicated by the broken line PTP^1 rather than by PP^1 .

Or again, although full variability of factors is present, assume that knowledge is imperfect. The consumer is in equilibrium during period I, but for some reason the price decrease in period II is not known by the consumer. Acting rationally, but with imperfect knowledge, the consumer will continue the expenditure pattern of period I.

Depending upon how the consumer purchased commodity X in period I, the price-consumption line will follow one of two alternatives. If the consumer purchased by quantity, the curve will follow an extension of RP to the point S . If the consumer purchased by "dollars or cents worth" the curve will follow an extension of NP to the point T .

If the consumer does not gain access to knowledge of the price decrease, the excess money or the extra quantity of the good will force a realization of this fact. This situation is not unrealistic. It might easily happen in the purchase of such goods as salt or pepper; or in

cases where a good, such as milk, is taken in definite quantities and the bill paid monthly.

When the price decrease becomes known the consumer will move to the equilibrium position P^1 . The price-consumption curve followed will be PSP^1 or PTP^1 rather than from P directly to P^1 .

Or again, let us assume full variability and perfect knowledge. The consumer is in equilibrium at P and he knows that the price decrease (OM/OL^1) is to be quickly followed by another (OM/OL^{11}). In Hicksian analysis the consumer will move from P to P^1 , increasing his purchases of X by RR^1 and reallocating ON^1 of money among all other goods. With the second decrease the consumer will move from P^1 to P^{11} , increasing his purchases of X by $R^1 R^{11}$ and reallocating ON^{11} of his money among all other goods. The consumer may decide to wait until the second price change occurs before he expends time and energy to reallocate his income among different expenditures.¹⁴¹

If the above decision is made, the price-consumption curve will follow an extension of NP to the point T . When the price change OM/OL^{11} occurs the consumer will shift to the equilibrium position P^{11} . The price-consumption curve will be PTP^{11} rather than PP^1P^{11} .

Although Mr. Hicks' attempts and results are admirable, his comparative statics analysis is simplified by the fact that only the end positions are pictured. Ignoring time as an element in the process of

¹⁴¹The principle by which this decision is accepted or rejected will be discussed in a later section. *Infra.* p. 78.

change means that the intermediate positions between one maximum and another are not pictured. Assumptions of full variability of factors, psychic frictions, and perfect knowledge take on additional meaning when time is included in the process of change. The use of simpler assumptions is subject to no criticism if we realize how this qualifies the results of our analysis. This must be true if we hope to make effective use of the results of theoretical analysis in attacking real life problems.

If we want to picture intermediate positions attained in moving from one equilibrium position to another, the problem must be treated as a short-run phenomenon. The implications of short-run adjustments must be realized before we can know how realistically an analysis such as Mr. Hicks' pictures the real world.

B. Ruby Turner Norris and Short-run Demand

Ruby Turner Norris, in a recent article in the Quarterly Journal of Economics¹⁴², deplored the lack of short-run demand analysis in orthodox theory. The thesis of the article is: "first, that it is unrealistic to treat demand in an undifferentiated way with respect to time [to which the writer agrees]; and second, that in short-run analysis the usual marginal utility approach is almost wholly irrelevant [to which the writer does not agree]. The purchase of goods in the short run --- is almost entirely divorced from any rational weighing of utilities or of marginal utilities of different goods against one another."¹⁴³

For analytical purposes Norris defines the short run as a period so short that income and tastes may be regarded as constant. In most of the analysis this period is implicitly identified with the span between paydays. Although income is constant the amount available for allocation within the period may be increased by drawing on savings and/or investments, or may be decreased by turning larger amounts into savings accounts. This latter point, however, receives little consideration in the analysis that follows.

Goods purchased within this time period are classified into four groups: commitments, petty goods, habitually consumed goods sufficiently costly so that the consumer addresses himself to the problem of attaining them cheaply, and experimental purchases.¹⁴⁴ Norris attempts to show that

¹⁴²"Analysis of Demand". 54:131-42. 1939.

¹⁴³Ibid. p. 131. ¹⁴⁴Ibid. pp. 132-37.

within these categories the use of marginal utility analysis is futile.

But more of this later.

The analysis is complicated by the fact that Norris fails to make certain concepts sufficiently clear. Nowhere does she state her assumption as to the manner in which the individual plans. (1) Does the consumer, in the light of present prices and anticipated changes in prices, plan his expenditures on the first day of the period; proceed on the basis of this plan, and at the end of the period use the residual income, if there is any, to experiment among goods that are not now included in his scale of preference? (2) Or, planning on the first day, does the consumer set aside a portion of his income to be used in experimental purchases throughout the period? (3) Or does she assume that the consumer, although he has made tentative plans on the first day, takes stock at the end of each day and rearranges his future plans for habitual and experimental purchases? At different times each of these three assumptions seems to be implicit in her analysis.

For example, on page 137 she states: "Left over, after commitments are met and habitually used goods laid by, as opportunity offers, is a residual amount of income. -- If the residual is positive, it represents an experimental fund, used by the consumer in unpredictable ways."

Assumption (1) seems applicable. However, on page 138, again speaking of experimental purchases, she states: "During the first week of the month a buyer might spend five dollars for a hat, and during the last week 15 cents for a sample of a new cold cream." Here assumption (2)

seems to be implicit in the analysis. Or, again speaking of experimental purchases, one page 138 she states: "Goods bought at different times in the income are often not weighed one against the other; and when they are (by looking backwards to the first purchase at the time of decision of the second purchase) ---." Here the third assumption seems more applicable.

Whether or not one agrees with the realism of the assumption it would be helpful to know its exact nature. Theoretical analysis has no meaning apart from the assumptions on which it is based.

Closely allied to the lack of precise assumptions is the fact that one is not sure whether Norris speaks in terms of maximum satisfaction position at a particular time or maximum satisfaction through time. In the third citation above the problem is one of equating utilities over time. Or again,

"Whether or not experimental expenditures on the part of the individual take place depends upon such incalculable factors as effectiveness of selling appeals ---, and, again, the time during the income period at which the sales appeal takes place. Most individuals become noticeably less experimental during the waning parts of the income period. Less of the income is left over, and therefore the danger of not being able to take advantage of some exceptionally good opportunity to buy an habitually consumed good is great."¹⁴⁵

The problem basic to this statement is not that of gaining maximum satisfaction at any one time but that of attaining maximum satisfaction through time. Further, when one speaks in terms of maximizing satisfaction it brings up the problem of anticipations. Norris fails to state whether

¹⁴⁵ Ibid. p. 137.

her analysis assumes perfect foresight or uncertainty concerning future changes in the givens.

The problem of satisfactions over time has been relatively neglected and within this sphere there is room for much investigation. Unless we assume perfect foresight the tools of static analysis cannot be used without modification in such an analysis. It is important to realize the limits of static analysis, and when more realistic investigations are made they should be hailed as an advancement over static tools.

Norris advocates the dismissal of marginal utility analysis in short run demand theory because she fails to recognize the true nature of marginal utility analysis and scientific procedure. Economic organization is so complex that it is impossible to incorporate all the variables into the theoretical structure. Phenomena are modified so that they can be handled within the analysis. The results of the analysis are applied in the light of the simplifications. When Norris finds the principles of marginal utility analysis do not fit the real life picture completely, she feels that it should be abandoned.

Norris states that petty goods form an important class of habitually consumed "with respect to which no weighing process or utility analysis can conceivably be applied."¹⁴⁶ Each individual has a margin below which he does not believe it worth while to weigh expenditures; petty goods are commodities whose price is below this margin.¹⁴⁷ Two objections to Norris' contention may be raised. First, realistically consumers do not always follow the calculus-like weighing process that

¹⁴⁶ Ibid. p. 134.

¹⁴⁷ Ibid. p. 134.

the analysis assumes but this does not invalidate the principle as a tool of economic analysis. Second, what Norris is saying is that the consumer believes that the added satisfaction that might possibly come from the weighing of utilities below this margin will be less than the cost of weighing the alternatives. Is this not marginal utility analysis? Norris forgets that the time and energy of the consumer are economics goods subject to as careful allocation as is his purchasing power. Forgetting this, Norris can make the statement: "The weighing of marginal utilities is often as repugnant to the consumer as it appears to be attractive to the theoretician."¹⁴⁸

On page 132 Norris states that the presence of commitments (debt payments, insurance provisions, etc.) leaves a very large part of the current income spent without free current choice. These expenditures, according to Norris, are automatic and without rational weighings of utilities.¹⁴⁹ She forgets, however, that we can assume that the consumer weighed utilities when the commitment was made, finding that the added satisfaction (or discounted added satisfaction in the case of durable goods) in having the good at that time was greater than the "accumulated" added disutility in having a portion of the future income allocated to a specific commitment.

Moreover, commitments projected from the past are subject to marginal analysis in the current allocation process. If the added satisfaction derived from allocating a portion of the now committed income to another use is greater than the cost of liquidating the investment, the change will

¹⁴⁸Ibid., pp. 154-55.

¹⁴⁹Ibid. p. 132.

be made. Contrary to the belief of Norris, consumer behavior in respect to commitments in the short run is within the sphere of marginal utility analysis.

For the third class of goods, those sufficiently costly that the buyer addresses himself to the problem of obtaining them cheaply, Norris sees the problem as that of gaining maximum satisfaction over time. Facing the market the consumer takes into account the supplies on hand and storage facilities together with the perishability of the good. The consumer is moved not only by present prices but also anticipated price changes. Anticipating a rise in price the consumer will tend to stock up; anticipating a decline he will tend to hold off purchases until the price change occurs. "Just as a seller's offers of his goods from a fixed stock tell nothing about production policy, so a buyer's purchases at any one time tell nothing as to the extent to which the consumer intends to use the good. --- The reason for the negatively inclined demand schedule in the short run is not the law of diminishing marginal utility, but rather the fact that at lower prices more people think that the price is as low as they are likely to find in some time, and so they buy or buy more."¹⁵⁰

However, with the static concept of maximum satisfaction at any period the principle of diminishing marginal utility does explain the negative inclination of the demand curve. In static analysis demand curves are

¹⁵⁰Ibid. pp. 156-57.

instantaneous concepts. It is implicitly assumed that the individual does not believe that a change in the price is but a prelude to further changes.¹⁵¹ Even in satisfactions over time the marginal analysis holds. The consumer will stock up only to the point where the gains resulting from purchases at present prices for future use is equal to the disadvantages of committing present income and the accumulated cost of storage.

The fourth classification deals with experimental purchases. "Left over, after commitments are met and habitually used goods laid by --- is a residual amount of income, --- it represents an experimental fund used by the consumer in unpredictable ways."¹⁵² These expenditures may be the basis of new wants that change subsequent expenditures. "Here again, the usual concept of weighing utilities is inapplicable, since the expenditures are essentially unplanned ---."¹⁵³

In experimental purchases the consumer makes estimates of the satisfaction to be gained. Thus, in allocating his income, the consumer attempts to equate marginal utilities even though some of these utilities are anticipated rather than known. The only difference is that one does not have prior knowledge as to the satisfaction to be received; it is a situation involving imperfect knowledge. Further, many of the experimental purchases are the result of consumer's desire to splurge.

¹⁵¹ Meyers, A.L., Elements of modern economics. p. 40. Prentice-Hall, Inc., New York, 1939.

¹⁵² Morris, R. Op. cit. p. 137.

¹⁵³ Ibid. p. 138.

The utility of all such purchases are estimated in total - the satisfaction of spending recklessly.

In spite of the flaws in her analysis, Morris has opened up the question of short run demand and has made valuable suggestions as to what must be considered in its analysis. First, she has implicitly recognized that the concept of a planning period is valuable in approaching the problem. Second, and again implicitly, she has recognized that the consumer plans not for any one instant but that current plans also consider the future. Realistically the problem for the individual is not maximum satisfaction at one period but maximum satisfaction through time. As Morris suggests¹⁵⁴ we must treat the problems of stocking up, holding off purchases, buyers' forecasts, commitments, and the effect of new wants.

¹⁵⁴Ibid. p. 140.

C. Short-Run Demand and the Theory of the Firm

At several points¹⁵⁵ Ruby Turner Norris has suggested that certain aspects of short-run demand analysis are similar to situations on the supply side. In the writer's opinion, the presence of commitments in short-run demand has a direct analogy in the short-run theory of the firm with its fixed costs. The presence of commitments makes consumer expenditure patterns less adaptable to changes in the relative price structure. Fixed costs limit the adaptability of the firm.

In developing the extent to which this analogy exists the following propositions may be set up that are applicable to the theory of the firm in the short run:

1. "In the short run, however, the very existence of fixed costs --- precludes full adaptability to changing amounts of variable factors."¹⁵⁶
2. "Adaptability can also be built into a plant ---. But flexibility will not be a free good. A plant certain to operate at X units of output per week will surely have lower costs at that output than will a plant designed to be passably efficient from $\frac{X}{2}$ to 2X units per week."¹⁵⁷

¹⁵⁵Ibid. pp. 132, 135-36, 140.

¹⁵⁶Stigler, G. Production and distribution in the short run. Journal of Political Economy. 48:507. 1939.

¹⁵⁷Ibid. pp. 310-11.

3. "Even after a plant has been built and equipped, it is usually possible to make alterations which will better adapt the plant and equipment to contemporary -- rates of output."¹⁵⁸

4. "These alterations will be carried to the point where the marginal accumulated cost of the change equals its discounted marginal returns."¹⁵⁹

The definition of optimum output in the theory of the firm is complicated by the fact that optimum may be defined in terms of optimum through time, i.e., may be based upon anticipated decreases and increases in the output of the firm. Paralleling this on the demand side, an analysis is complicated by the fact that maximum satisfaction positions may be defined in terms of current conditions or may refer to maximum satisfaction through time, i.e., based on anticipated changes in the "givens."

In the following discussion maximum satisfaction positions are defined in terms of given conditions and full variability of factors.

1. In the short run the existence of fixed costs, investments in building, machines, and contractual salaries, means that the plant is not completely adaptable to contractions or expansions in the rate of output. For example, in periods

¹⁵⁸Ibid. p. 311. ¹⁵⁹Ibid. p. 318.

of contraction, adaptation will not be complete until sufficient time has elapsed for salaries to be reduced or omitted, for some machines to depreciate to zero value or to be converted to other uses, and for reductions in the expense of the building proper. This, however, is not the short run; during this period these costs continue although the contributions of these factors to the final product have been reduced or eliminated.

In the process of expansion variable factors may be added but beyond a certain point the building will be filled to capacity in the technical sense. This combination of factors may fall short of the optimum combination, given the prices of productive factors and of the final product.

The analogous case in short-run demand is the existence of commitments in the expenditure pattern that preclude the possibility of complete adaptability to changes in the relative price structure. Non-liquid investment of resources may mean that in the short run the consumer is not able to move directly from one position of maximum satisfaction to another maximum position. Over a longer period of time resources may be released from their commitments, e.g., installment payments for automobile completed, and complete adjustment may be made to the change.

In the short run, unless liquidity is present, the consumer's best position may be a less-than-maximum satisfaction position, the

maximum defined in terms of full variability. The consumer may be able to reach the maximum position if the added satisfaction in reaching the maximum is greater than the cost of liquidating the commitment. Just as a firm may operate when only variable costs are covered, a consumer may be satisfied with the best short position even though it is less than the maximum possible if full variability of resources was present.

For example, three automobiles, A, B, and C are each equally satisfactory to the consumer. He estimates straight line depreciation on each car at two hundred dollars per year. Facing the prices in the market the consumer purchases automobile A. A year later his preferences are unchanged but prices have changed and automobile B is the best buy. Car A is now worth to him what he would originally have been willing to pay for it minus two hundred dollars for depreciation. In the resale market, however, he can only get this price minus three hundred dollars. The cost of liquidating his investment is one hundred dollars. If the added satisfaction of having automobile B is less than this cost, he will continue to hold automobile A, although his maximum satisfaction position would mean the purchase of automobile B.

A firm may operate, for short periods, when variable costs are not covered for fear that a temporary shut-down would mean loss of the future market. Thus, the firm may not take advantage of the best short run position in order to insure long run adaptability.

A consumer may fail to take advantage of a maximum position. In the above discussion¹⁶⁰ the consumer failed to take advantage of the maximum P_1^L in order that the maximum P_1^H could be more easily attained.

2. Flexibility is frequently built into plants in trades where there is a rather high degree of fluctuation in demand for the product. The plant then can produce over a range of outputs at reasonable efficiency, rather than with high efficiency at one certain output but considerable loss of efficiency during periods of contraction from and expansion above that output. The U-shaped average cost curve of the plant when flexible will be flatter than when it is unadaptable but at no point will it reach the low average cost that the unadaptable plant can attain. At the optimum output the per unit costs of the plant when flexible will be higher than those of the plant when it is unadaptable. Flexibility is not a free good. Here again we find an analogy in chart-run demand theory.

The consumer may foresee rather drastic changes in the relative price structure in the near future that will mean complete revision of his expenditure pattern. At present, to achieve the maximum satisfaction position, he must sink some of his resources into commitments that will be projected into the future. If he feels that such commitments will hamper his attainment of future maxima, he may sacrifice the short-run maximum position in order to maintain this

¹⁶⁰Supra, p. 62.

liquidity. He may sacrifice the house he wishes to buy for one with good resale value. As on the supply side where flexibility is not a free good, liquidity on the demand side has its price. The consumer may have to choose between planning for a possible ultimate maximum position involving commitments (hence, less adaptability), or a possible less-than-long-run best position with the certainty of greater adaptability to future changes.

5. After a plant has been built and machinery installed it is almost never completely unadaptable. In most cases it is possible to alter the physical plant and/or the production process in such ways that revenue will be increased or losses reduced at the current output. The physical plant may be enlarged or in times of contraction sections of the plant may be leased to other entrepreneurs. Production methods may be altered so that more or less men may be used; machines may be bought or sold. Insofar as it is possible and feasible all "fixed" costs are made more or less variable, leaving only the smallest possible proportion of the total costs in the fixed cost classification. The extent to which such changes will be made (how long they will be profitable) will depend upon: (1) anticipated duration of the current output, and (2) the money costs of making the change.

On the demand side, once the consumer has made commitments in reaching his equilibrium position, it is seldom that it is impossible

to adapt his expenditure pattern to changes in the relative price structure. For example, insurance policies may be dropped, thus freeing a portion of the income from a commitment. One might reduce the amount allocated to commitments that are moral rather than legal, e.g., reduce the amount pledged to some charity institution. As on the supply side, these efforts to adapt one's expenditure pattern to current prices will depend upon (1) the anticipated duration of these prices, and (2) the costs involved in making the change.

4. Alteration in the plant, for better adapting it to present output, will only take place if the action is profitable. This may mean reduction of costs or increases in revenue, increasing net profit or reducing the net loss. Alterations will continue until the marginal "accumulated" cost of the change equals its "discounted" marginal return. The longer the current output continues, the lower the costs of alterations, and the lower the interest rate, the sooner the alterations will start and the greater will be their scale.

On the demand side the same principle will govern alterations in commitments. The cost of changing will be the losses involved in liquidating the commitment. (1) The money cost involved in breaking a legal commitment. If the installment purchase of a radio is given up the money cost is the value of the radio minus the payments not yet made. (2) The money measure (in the consumer's estimation) of the non-monetary losses involved in breaking a moral

commitment. The longer the current situation continues, the lower the cost of making the change, the sooner and greater will be the alterations undertaken in order to adapt the expenditure pattern to current prices.

When the commitment is in the form of an installment purchase we have a situation that facilitates adaptation. The longer the current price structure continues the more advisable it is to alter commitments. At the same time the cost of making the change is decreasing. The purchase, e.g. the radio, is steadily depreciating and payments are being made reducing the amount left to be paid.

D. Theoretical Structure for Demand Analysis¹⁶¹

1. Introduction

The purpose of economic theory is to provide structures whereby we are able to trace the results of certain conditions. It should explain the developments resulting from given initial conditions and to compare what does happen with what might have happened if the assumptions had been of a different character.

The results of an analysis show the events that necessarily follow from the assumptions made; "laws" of economic theory are but deductions from logically-consistent assumptions. Statics takes as givens the situation that prevails at any given time and the results show what will happen in a timeless economy. Dynamics considers the present situation and the expectations of future events. The results are a process of change showing the developments through time. The consideration of expectations is the important break between statics and dynamics.

During a process of change some more or less definite plan is formulated and attempts are made to carry this plan to completion. Individuals or business firms do not change their plans with every change that occurs in other factors. Plans are, however, subject to revision because the separate ends may be inconsistent or the plan made become useless because of external changes.

¹⁶¹The development of this section has been in part based on the work of Rosenstein-Rodan (Op. cit.) and Lindahl, E. Studies in the theory of money and capital. Part I. George Allen and Unwin Ltd., London, 1939.

Starting with the original plan and considering the nature of the external factors, an analysis may (1) determine the action during the period that the plans are constant, and (2) show how changes in the factors necessitate a revision of the plan. Within technological and psychological "givens" we can analyze the formulation and revision of plans, and thus explain the process of short-time adjustments in plans to better adapt them to changes.

In the analysis of short-run demand if we know the plans for allocating income, the changes in external factors, and how these plans change with changing conditions, we could build a structure showing consumer behavior resulting from attempts to carry out the plan. The aim of the following discussion is the development of such a structure.

2. Consumer Behavior and the Planned Period

All consumer expenditures are not the result of planned action. Many purchases are the result of impulsive actions that may not even be consistent with previous or future behavior. The following discussions eliminate all consumer behavior that is not based on and motivated by some more or less concrete plan.

Initial consumer plans for the allocation of resources would involve: (1) the setting up of alternative courses of action; (2) the evaluation of these alternatives in the light of contemporary facts and expectations of the future; (3) the choice of the alternative that will maximise the ends sought.

After a plan is determined it is not subject to constant revision following each change in factors relevant to its completion. Plans are made at intervals and between these periods of revision the consumer proceeds on the basis of the alternative plan chosen. This is true because (1) human knowledge is not perfect. An individual is not capable of knowing immediately all the changes that occur in the relevant factors, i.e., people are often not aware of price reductions for some time after the change has occurred. Even with knowledge of the change assimilation of this knowledge takes time, time for individuals to view the change and realize how it will affect their plans. (2) An individual's time and energy are economic goods and as such are subject to careful allocation among alternative uses. Time and energy are allocated along three main channels: money-earning and money-spending capacities and leisure.

The individual has little opportunity to dictate the amount of time and energy allocated to money-earning capacities. The marginal utility of time and energy unused in money-earning capacities is equated between leisure and attempts to make the most economical allocation of his money income. Often the individual develops habits of expenditure, so that too much time and energy will not be allocated to the money-spending capacity.

This is a rational defense for the failure of individuals to continually revise their plans for allocation of resources. These plans, however, are subject to review. A plan will only be used as long as the

discounted value of the time and energy saved is greater or as great as the accumulated losses involved in failure to adjust to changes in relevant factors. At any given time, then, the individual may formulate plans and expenditure habits consistent with current and anticipated facts, and revise these plans at future intervals in time.

The time interval between periods of revision shall be referred to as the planned period; and the time at which plans are made or revised as the allocation point. The length of the planned period, or the frequency with which plans are revised, will vary from one individual to another.

The determinants of the length of the planned period will depend partly upon the temperament and actions of the individual and partly upon the nature of external conditions.

(1) The more numerous and valuable are other uses of time and energy the longer will be the length of the planned period. This is obvious from the preceding discussion. (2) The ability, or the desire, of an individual to foresee his future wants more or less concretely. Human foresight is not perfect and it is present in different individuals in varying degrees. The greater the ability and desire to foresee the future, the longer the length of the planned period. It is improbable that a person who lives by the philosophy "Eat, drink, and be merry, for tomorrow we die" will plan the allocation of his resources for more than a very short time. It is conceivable that such an individual would make completely new plans every day. (3) The length of the planned

period will be in part determined by actions that are part of the plan itself. Before undertaking some action whose effects will project themselves into the future the individual will attempt to foresee future conditions for that period of time. If, for example, an individual makes definite commitments of a portion of his resources for two months hence, he must have some idea as to how his resources are to be allocated for the duration of the commitment. (4) The more rapidly and drastically external factors change, the shorter will be the length of the planned period. The greater the frequency of changes in the relative price structure, the shorter will be the length of the planned period, as the consumer will be less able to anticipate all the changes. The loss involved in continuing old expenditure patterns will be greater; false anticipations of prices or satisfactions more probable; the awareness of the necessity of planning more acute; and the value of time and energy allocated to money-spending capacities will rise relative to other uses.

The more certain an individual is that his tastes and income stream are subject to no drastic alterations in the future, the longer will be the length of the planned period. If uncertainty in this respect is present the individual will formulate plans only for the time he is sure that tastes and income will remain the same. When changes occur, especially drastic ones, it is almost certain to mean completely new plans. The individual, therefore, plans for short periods waiting for the change that will mean complete revision. After the revision the new plan may

include experimental purchases among new goods. The plan will be for a short period so that realized and anticipated satisfactions may be compared. Gradually, however, the planned period will return to its former length.

Even as the length of the planned period varies, the nature of the plan itself varies from individual to individual. There are, however, some fundamental characteristics that are present and calculable in every plan.

In every plan the present is planned in much greater detail than the immediate future, and the immediate future in greater detail than the most remote section of the planned period. While plans for the present are specific, the plans of the later phases of the period are determined only within limits. For example, the budget of an individual for the succeeding year will have definite amounts allocated to the majority of wants in the first month and a small miscellaneous item. Looking into the future he will allocate specific amounts to food, shelter, clothing, and entertainment for the sixth month, but wants that had definite allocations in the first month, e.g., taxi fare, will be relegated to the miscellaneous account or estimated within a certain range. For the twelfth month all but food and shelter may be estimated within certain limits or relegated to the miscellaneous account. Borrowing Rosenstein-Rodan's terminology¹⁶² as we look into the future we find fewer "concrete" and more "blocked" allocations.

¹⁶²Op. cit. p. 81.

The planned period may be divided into sub-periods. If the period is longer than the space between paydays the sub-periods may coincide with this space. As the first sub-period is passed, all other sub-periods shift (the second sub-period now becomes the first, etc.) and a new sub-period is attached at the end of the period. As the shift occurs a portion of the blocked allocations in each sub-period become concrete allocations. The plan is a continuous affair, as one sub-period passes another is added.

At the allocation point plans are revised in the light of the results of the previous period, the changes that occurred during the period, and revised anticipations. The changes or revised anticipations may be with respect to income stream, new wants, prices, or satisfactions. Plans may need but slight modification or a completely new plan may be necessary.

3. Possibilities of Demand Analysis Within the Framework of the Planned Period

The planned period forms a broad and complex skeleton within which we can plan a model of certain aspects of demand analysis. The analogous theory of the firm could be placed within such a structure. Norris' discussion would have been much clearer within this scheme.

The effects of anticipated price changes can be handled within such a scheme. The effects of a price change on consumer demand will depend

upon how the consumer anticipates the future position of the price of the good. If a price decrease occurs the consumer may anticipate: (1) A further change in the same direction; (2) A change back to the original higher price; (3) There will be no further change.

If the price decrease is thought to be but a prelude the further decreases the consumer will tend to hold off purchases of this good until prices are more favorable. The extent of this action will depend upon the urgency of the need for the good, its perishability, and available storage facilities. While waiting for the anticipated decrease the consumer may increase savings and/or increase the quantities taken of other goods, probably luxuries. For short periods, then, a price decrease may cause a shift to the left in the demand curve for the good.

If the price decrease is thought of as a prelude to a change back to the original price, the consumer will attempt to stock up on the good before the higher price is reestablished. In order to take advantage of the opportunity the consumer may draw extra purchasing power from savings and/or sacrifice the opportunity to satisfy luxury wants during this same period. Here, the same price decrease will cause a shift to the right for the good for this short period. The demand curve for other goods may shift to the left or be eliminated during this period even though their prices remain unchanged.

If the consumer projects the present price level into the future, there will be no problem of holding off or stocking up. The quantity purchased will increase but there will be no shift in the demand curve if

other factors remain constant.

The presence of commitments will influence the nature of the plan at the allocation point. Here, future plans are conditioned by past actions. Certain portions of the income must be allocated to these commitments unless it is economical to liquidate them in view of given conditions. Assume at the allocation point the consumer faces a general increase in the relative price structure. This means that the real income of the consumer is reduced. The presence of commitments also means that the income available for allocation at this time is reduced even though the income stream is constant. The consumer, in adjusting to the general price increase, may plan short-run adjustments for the life of the commitments.

In the short run under the pressure of high prices and reduced available income the purchase of some goods may be reduced. Commodities, such as clothing and automobiles, which wear out gradually may be made to last a little longer. The demand curve for these goods would shift to the left or be eliminated entirely for short periods.

Again, under these conditions, the consumer may feel that too much money is wasted on petty expenditures. The margin, below which the consumer feels it uneconomical to weigh alternatives, will be lowered or dispensed with entirely. Moreover, the price of money goods will have risen above the margin in the general price increase. Thus for short periods the inelasticity of the demand for some goods will become elastic.

Anticipated income stream will also affect the plans of consumers at the allocation point. Assume that the consumer can anticipate the direction of the change but not its extent or the time that it will occur. He will try to account for this change in the income stream in his plans at the allocation point. If the change is to be upward, the consumer will be more willing to take on commitments that will be projected into the future, e.g., installment purchases. Though prices do not change the demand curve for commitments may shift to the right at this time. In order to undertake these installment purchases, before the income change occurs, the demand curve for other goods may shift to the left during this same period. Further, the consumer may feel that with the future increase in income will allow the margin for petty goods to be raised. More goods will fall in the petty class at the allocation point. Some goods formerly having a somewhat elastic demand will not have a price elasticity that is completely inelastic.

If the anticipated income change is downward the consumer will attempt to make short period adjustments in his expenditure pattern until the extent of the decrease is known. At the allocation point the demand for new commitments will probably disappear; the consumer will not wish to allocate future income when he is not sure of the extent to which income is to be reduced. Even though prices are constant and income is still unchanged, the demands for all other goods may shift to the left at the allocation point. The consumer may wish to build up a cash reserve to act as a "shock absorber" when the anticipated income decrease occurs. Included in the plans may be a lower margin for petty goods,

increasing the price elasticity for some goods.

At the allocation point, anticipations of new goods to satisfy old wants or of new wants themselves will have the same effect as anticipated reduction in income on the demand for goods already purchased. The demand for new goods will be elastic for all income groups, the lower the price of the good the greater the number of people who will try it. The individual, when making his plans, will be interested in one unit for experiment, or none at all if the price is too high. In future allocation plans, after the good has been tried, the consumer will set up a demand schedule for or eliminate the good from further consideration, depending upon the satisfaction received.

The preceding discussion is in mere outline form, but it does show the possibilities of the use of the planned periods in demand analysis. The concept of planned periods and maximum satisfaction over time can form the basis of a more realistic approach to demand theory.

B. Conclusion

The justification of further refinements in demand theory is the fact that any advance that brings our theoretical structure closer to reality will mean a more fruitful economic analysis. Economic theory is not an intellectual exercise. It is a means of understanding our complex economic organization and of evaluating social policy in the light of the ends sought. Any development that will bring our analytical map closer to reality is justifiable. Even if the refinements are not wholly incorporated in our theoretical structure, investigation of them is worth while. The more aware we are of the limitations of our analysis, the more knowledge we gain concerning these limitations, the more successful we will be in the application of the results of economic analysis.

Equilibrium analysis is a cornerstone of economic theory. Given the data concerning tastes and obstacles such an analysis will determine the magnitude of economic quantities when complete adjustment has been made, if the data does not change during the period of adjustment. However, there are few constants in our economic system so the main purpose of equilibrium analysis is to explain tendencies. To work out this tendency the following assumptions are made: (1) single market price; (2) instantaneous adjustments of demand and supply; (3) one change of data at a time; (4) no frictions arise during transition, and (5) unique solution of the problem.¹⁶³

¹⁶³See Rosenstein-Rodan, N.P. Op. cit. p. 99.

Demand, realistically, is a function of both present and future prices as the consumer wants maximum satisfaction through time. Thus, the determination of equilibrium out of demand will depend upon contemporary conditions and anticipations of the future. If we study successive attempts of consumers to adapt their expenditure patterns to changes, in the light of expectations, commitments, and psychic frictions, we may find that the nature of the equilibrium reached is not subject to a unique solution. The concept of the planned period and maximization of satisfactions over time will force a consideration of intermediate positions rather than focusing attention upon the full long run equilibrium position.

Insight into the problems of consumer planning and maximization of satisfaction over time may be gained from the study of empirical data. Budgets studied in the light of external factors, e.g., the consumer's income stream, will furnish a wealth of information as to how consumers plan the allocation of their resources. A study of the budgets of factory workers by the Ross Federal Research Cooperation showed that, in the majority of cases, seventy-five percent or more of earnings were spent by the end of the day following payday.¹⁶⁴ This seems to indicate that the consumer does tend to plan his expenditures and subsequently makes the allocations in the early part of the span between paydays.

Comparison of the budget (the plan) with the actual expenditures will furnish information concerning attempts to revise plans in order to adjust to changes that occur in the relative price structure or the income stream. Further, attempts to hold off purchases or to stock up may be identified

¹⁶⁴Monthly Labor Review, January, 1939. p. 104. Vol. 48.

when examining expense accounts. Knowing the nature of the income stream and current prices, these attempts will give some indication of how future conditions are anticipated in present plans.

We cannot hope to achieve complete realism in our theoretical structure. The study of empirical data can be fruitful. It can serve as a justification of the assumptions used; it will make us more aware of the nature and extent of the limitations of our analysis, or, it may serve as a guide to more realistic analytical maps.

III. ACKNOWLEDGEMENT

The author is greatly indebted to Dr. Mary Jean Bowman who suggested the topic and gave many valuable suggestions during its development.

The author also expresses appreciation to Dr. Margaret Reid and Dr. Charles Shohan who read and criticized parts of the manuscript.

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