

MODELLING Menger's CONSUMER THEORY

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The starting point of this paper is the idea that Menger's consumer theory cannot be classified as marginalist since there are important points of difference. It is shown that Menger's ideas about human needs imply a hierarchical system of choice in which primary needs are satisfied before secondary needs. The paper demonstrates the preference system and the form of the utility function which emerges from Menger's views. There is also a connection made with similar subsequent work and an examination of the implications of Menger's ideas for the theory of demand. In particular, it is shown that Menger's conception might result in kinked or multi-kinked demand curves.

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1. INTRODUCTION

Until the last two decades, Menger was classified as a member of the marginalist trinity. Since then, however, an increasing number of historians of economics have promoted the view that Menger cannot be categorized in the same school as Jevons and Walras (see for instance Jaffe, 1976; Alter, 1990; Staley, 1989). Some of them have attempted to provide evidence of the difference by concentrating on specific aspects of Menger's economic thought. For instance, it has been argued that Menger's emphasis on the concepts of time, uncertainty and disequilibrium places him outside the marginalist tradition (Streissler, 1973; Loasby, 1976; Alter, 1982). Furthermore, in the last decade there has been a renewed attempt to examine Menger's theories of value, prices and capital in the light of his economic methodology (for a review see Alter, 1990a). Having mentioned the most important differences of Menger's thought from the standard marginalist approach, it should be kept in mind that Menger's economics still exhibit a crucial marginalist characteristic: value is attributed to goods at the individual's margin of decision.

However, very few authors have concentrated on Menger's consumer theory. Actually, the few discussions concerning this theme are to be found in articles in which Menger's ideas on consumer theory are not the main subject (Georgescu-Roegen, 1966; McCulloch, 1977; Gowdy, 1985; Alter, 1991). This paper concentrates

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exclusively on Menger's consumer theory, and by interpreting it in a modern format, attempts to demonstrate that it is quite different from the standard marginalist consumer theory. Furthermore, the paper discusses the consequences of Menger's theory for the construction of demand curves. One might have some methodological objections in recasting nineteenth century economic works in a modern (formal) framework. However, the existence of numerous examples where old ideas have been interpreted in terms of modern economic analysis, has almost made it a standard practice (e.g. Blaug, 1978). It has to be mentioned though that the case of Menger is more sensitive given the Austrian methodological suspicions concerning formalization. However, recent research indicates that Menger used formal methods of presentation of his arguments in his early writings. In particular, in his notes leading to his *Grundsätze* which were written in the period of 1867 to 1868, he employed graphs and some formal analysis to illustrate his views on value (for a detailed discussion including Menger's use of inverted triangles, see Yagi, 1993).

Thus, the purpose of this paper is to provide additional evidence concerning the uniqueness of Menger's ideas by offering a formal model of consumer choice which is based on his views and demonstrates the difference from the marginalist approach. More specifically, we will see that the starting point of his system is the idea of the irreducibility of needs which has important implications for the traditional theory of the consumer. Moreover, it will be seen that one of the consequences of Menger's approach is that it produces kinked or multi-kinked demand curves.

The first section of the paper will discuss Menger's views on consumer choice. The next part will present a formal model of his ideas and will make a connection with existing literature. The third section will provide a discussion of the implications for the construction of demand curves.

2. MENDER AND CONSUMER CHOICE

First it has to be mentioned that Menger's starting point is the individual and his needs without formally distinguishing between production and consumption process. Thus, the concept of human need is fundamental in Menger's economic thought. In particular, it constitutes the cornerstone of his definition of the economic good. A thing acquires its goods-character only with reference to a human need (Menger, 1950 [1871], p.52). Furthermore, Menger's classification of goods into four orders again has to do with its type of connection with the human need. As Menger states:

"To designate the order of a particular good is to indicate only that this good, in some particular employment, has a closer or more distant causal relationship with the satisfaction of a human need." (Menger, 1950, p.58)

The classification of goods into orders depends on their directness in satisfying human needs. First order goods for example, satisfy human needs directly while higher order goods satisfy human needs indirectly (Menger, 1950, pp.56-57). The emphasis on human needs can also be seen from the fact that Menger requires the command of complementary goods as a condition of the goods-character of higher order goods (Menger, 1950, p.59).

It follows that value is seen as something which is not inherent in goods but something which is connected to the human needs (Menger, 1950, p.116). Furthermore, Menger sees the "differences in the magnitude of value of goods" as the central economic problem. However, the differences in the magnitude of value of goods depend on the degree of importance of satisfactions. The argument becomes clearer in the discussion of the theory of value. Menger states:

"..it is above all a fact of the most common experience that the satisfactions of greatest importance to men are usually those on which the maintenance of life depends, and that other satisfactions are graduated in magnitude of importance according to the degree (duration and intensity) of pleasure dependent upon them." (Menger, 1950, p.122-123)

Menger implies here that needs cannot be reduced and that they have a hierarchical structure. This contrasts with the standard marginalist approach (see also Hutchison, 1953, p.141; Georgescu-Roegen, 1954; Gowdy, 1985, pp.106-107; Staley, 1989, p.147; White, 1990, pp.354-55; Alter, 1991, pp.100-3 and for an opposite viewpoint Ekelund and Hebert, 1983). Recent research concerning Menger's pre-1871 manuscripts has indicated that in his first approach towards value, Menger was employing the concept of marginal increment of wants and that he had conceived a diminishing marginal utility curve (Yagi, 1993, pp.707-708). However, as Yagi argues Menger had not developed the idea of the order obtaining among goods (goods of lower and higher order) in these early writings (Yagi, 1993, p.712).¹

In Menger's hierarchy of needs, the satisfactions which correspond to the maintenance of life are more important and thus are primary. Menger becomes more specific when he writes:

"Thus if economizing men must choose between a satisfaction of a need on which the maintenance of their lives depends and another on which merely a greater or less degree of well-being is dependent, they will usually prefer the former." (Menger, 1950, p.123)

Menger proceeds to suggest a possible classification of the categories of needs.

"The maintenance of our lives depends on the satisfaction of our need for food and also in our climate on clothing our bodies and having a shelter at our disposal. But merely a higher degree of well-being depends on our having a coach, a chess-board, etc." (Menger, 1950, p.123)

According to Menger there are four classes of needs which are, in a descending order, the preservation of life, of health, of future life and health, and provisions of various kinds of diversion (Alter, 1991, p.101). There is also a clear attempt to connect the hierarchical ordering of needs with categories of goods. For instance the class of goods which can be classified as "food" satisfy the primary need to eat. A number of subsequent authors like Little, (1950) Georgescu-Roegen (1954), Encarnacion(1964) and Earl (1983) have pursued similar ideas. This ranking of needs implies a hierarchical preference system of choice, in which more important or more urgent needs (usually life needs) must be satisfied first, before other less important or less urgent needs are considered. In Menger's words:

"Hence there can also be no doubt that, when men have a choice between doing without a comfortable bed or doing without a chessboard, they will forgo the latter much more readily than the former." (Menger, 1950, p.123)

The hierarchical character of Menger's system becomes more apparent when he introduces the concept of threshold.

"The satisfaction of every man's need for food up to the point where his life is thereby assured has the full importance of the maintenance of his life." (Menger, 1950, p.124)

In other words, secondary needs are only considered when the primary needs reach a saturation point or a threshold.

Another important issue in his system is the idea that a particular good or a category of goods can satisfy more than one need. Menger gives the example of food which can satisfy the basic need of survival but also entertainment needs like taste (Menger, 1950, p.124). A good example of the application of Menger's views ideas on consumer choice is to be found in his famous table of needs satisfaction. Menger gives a representation of his hierarchical approach with ten categories of needs. In the table, he gives a numerical example of his scheme by assigning the number 10 to the most important need on which life depends, and smaller numbers to less important needs. He also presents decreasing numerical values to show the degree to which individual needs are satisfied (Menger, 1950, pp. 125-127). In the discussion of the table, Menger places food as the most important commodity. When the consumption of food reaches a certain point (satisfaction of the primary need to eat), then the need to consume tobacco becomes more important (secondary need). Georgescu-Roegen (1968) states that we can obtain a "need scale" from the table and that this implies lexicographic utility. Thus, one can discern from the table, a hierarchical system of preferences with threshold levels for the primary needs.

In sum then, Menger believed that the concept of human needs is fundamental for the understanding of the theory of value. He also thought that human needs are ordered in the sense that some of them are basic, primary or more urgent and other are non-

basic, secondary or less urgent. Primary needs are satisfied first and secondary needs second. There are saturation or threshold points after which the lower ordered needs are considered. Furthermore, Menger indicates that there is a more or less clear correspondence between needs and goods but also he points out that one particular good or class of goods may satisfy a number of different needs. All the above is in marked contrast with the mainstream marginalist consumer economics (especially with the ideas of Edgeworth and Pareto, see also Blaug, 1978; Backhouse, 1985).

3. A FORMAL INTERPRETATION

Menger's idea that needs are of varying importance differs from one of the standard assumptions of the marginalist consumer theory which implies that economic agents engage in full substitutability. In the terminology of axiomatic theories, this means that all preferences can be substituted fully. Some authors have termed this type of preferences, Archimedian preferences (see Borch, 1968). To take an example, food can in theory be substituted completely for perfume. In formal terms the Archimedian preferences can be stated as follows: Suppose that we have two bundles of goods x and y , and that the symbol \mathbf{P} means "preferred to".

$$(x_1, y_1) \mathbf{P} (x_2, y_2)$$

this can be reversed by increasing x_2 . This implies that there exists an $x > x_2$ such that:

$$(x, y_2) \mathbf{P} (x_1, y_1)$$

Menger's assertion that primary needs must reach a given level of satisfaction first before the secondary ones are considered, implies that agents have non-Archimedian preferences. We have seen a number of passages where there are strong indications that Menger views economic agents as characterized by limited preference substitutability. In particular, Menger believes that preferences are hierarchical in the sense that higher priority choice variables must reach certain levels before lower priority choice variables are considered. The idea can be found in some contemporary types of choice in psychology, politics and sociology (see for instance Maslow, 1954; Tversky, 1969; Ardrey, 1970; Prelec, 1982). Furthermore, although it has not made a substantial impact to contemporary theory of choice, a number of economists like Little, (1950, 1957), Georgescu-Roegen (1954), Encarnacion (1964), Chipman (1971), Gorman (1971), Earl (1983), Falkinger (1990) and others have discussed hierarchical-type preferences (for a review see Drakopoulos, 1994). Hierarchies can also arise naturally in modern production theory (Fare et al, 1993).

To express the above in terms of goods, we assume that we have two vectors

$$x = (x_1, x_2, \dots, x_n)$$

$$x' = (x'_1, x'_2, \dots, x'_n)$$

then $x \mathbf{P} x'$ iff

- either 1) $x^* > x_1 > x_1'$
 or 2) $x_1 = x_1' < x_1^*$; $x_2 > x_2'$
 or 3) $x_1' < x_1^* < x_1$
 or 4) $x_1^* < x_1', x_1'$; $x_2^* > x_2 > x_2'$
 : : :
 $x_{n-1}^* < x_{n-2}; x_{n-1}', x_n' < x_n$

The above basic system (which is in general form) implies that when the first need is satisfied (the starred variables), then the second most important need comes to the picture. At first glance the above formulation might look similar to a lexicographic system of choice. However, there is a basic difference here in the sense that the hierarchical model allows for a considerable degree of substitution once the target or threshold has been met. On the contrary, lexicography implies virtually no substitution (see Drakopoulos, 1992).

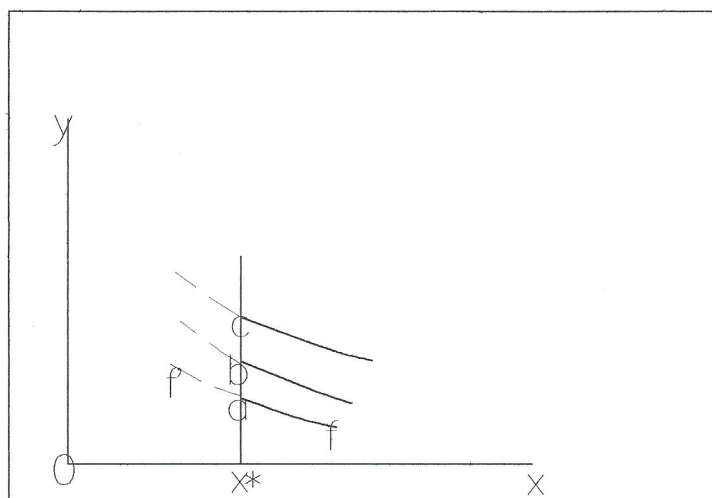
Naturally, Menger does not use the above terminology. He uses the term "direct" in the ordering of goods. Ordering in terms of directness is slightly different than ordering in terms of priority, but the essential idea is the same. Let us now formulate Menger's ideas having in mind the above framework. There are two goods, two needs and each good satisfies a corresponding need. Taking Menger's example, let good x be food and good y tobacco, then the consumer will operate in terms of the first need initially and of the second need after a threshold point (x^*) where his hunger becomes less urgent. According to Menger, food will be priority up to a point after which tobacco comes into the picture.

$(x_1, y_1) \mathbf{P} (x_2, y_2)$ iff

- either 1) $x_2 < x_1 < x^*$
 or 2) $x_2 = x_1 < x^*$; $(x_2 + y_2) < (x_1 + y_1)$
 or 3) $x_2 < x^* < x_1$
 or 4) $x^* < x_1, x_2$; $(x_2 + y_2) < (x_1 + y_1)$

The graphical representation of this simple example is the following:

Figure 1



Line abc has some characteristics of the indifference curve but cannot be called an indifference curve because the points on it are ordered (i.e. $b \succ a$). However, the indifference characteristic is that all points to the right of ab are preferred to all the points to the left. The vertical slope of the line implies that under no circumstances will the agent substitute x for y. Only when x is at a certain limit, does the preference for y come into the picture. The second criteria are represented by the curves which like ab can be called quasi-indifference or behaviour curves (e.g. Little, 1957). Due to the existence of those curves point c is preferred to point b.

This simple model can be extended by introducing three criteria corresponding to different types of needs. Thus, we take two goods, food (x) and clothing (y), and we assume that (x) satisfies the primary need to eat. After a threshold point (x^*) the secondary need comes into the picture, which is clothing, and it is satisfied by good y. The third criterion represents a social need which arises after a threshold point y^* and is satisfied better with food. As was seen, Menger maintains that one good or category of goods can satisfy more than one need. For instance, he sees food as satisfying the need to eat but also taste (entertainment or social need). In this case the system of choice is the following:

$$(x_1, y_1) \succ (x_2, y_2) \text{ iff}$$

either 1) $x_2 < x_1 < x^*$

or 2) $x_2 = x_1 < x^*$; $y_2 < y_1 < y^*$

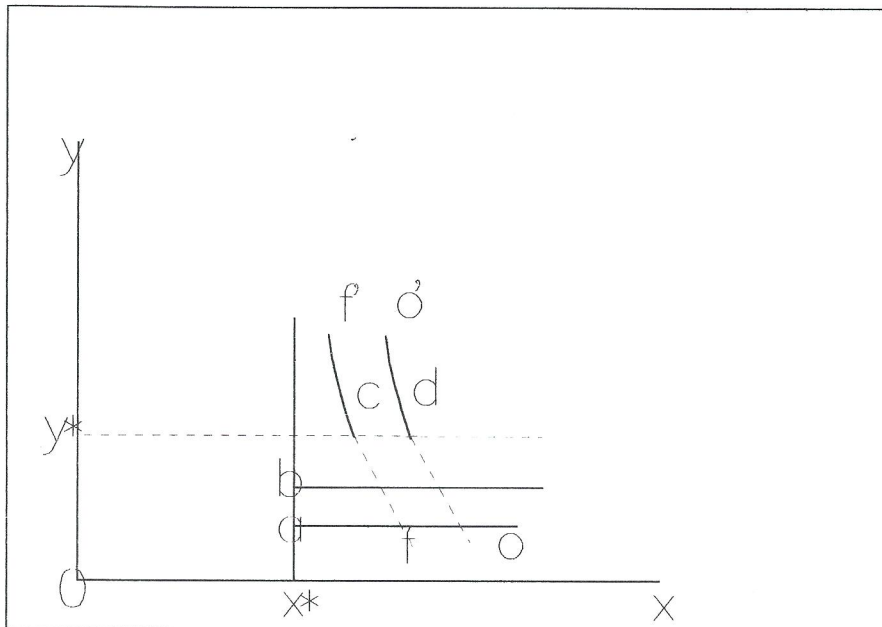
or 3) $x_2 < x^* < x_1$

- or 4) $x^* < x_1, x_2; y_2 < y_1 < y^*$
 or 5) $x^* < x_1, x_2; y_2 < y^* < y_1$
 or 6) $x^* < x_1, x_2; y_2, y_1 > y^*; (x_2 + y_2) < (x_1 + y_1)$

The graphical representation of the above is depicted in figure 2.

After the threshold point has been reached the quasi-indifference curves with the horizontal slope come into the picture. Their slope represents the preference for y (clothes) once x^* (food threshold) has been achieved. The third criterion, which is based on the social need, is represented by the type oo' and ff' . The consumer returns to preference for food which now satisfies a social need. In this case their slope of the curves represents the preference of the consumer for x once y^* has been reached. (see also Georgescu-Roegen, 1954 and Little, 1957). It is evident from the choice model that: $b \succ a$, $c \succ b$, $d \succ c$. Moreover, the system provides a more realistic perspective towards the issue of luxuries versus necessities because it connects it with the idea of basic and non-basic needs.

Figure 2



One might have some reservations to the connection of the above system with Menger given the Austrian attention to uncertainty and lack of information. However, there are a few points which can be mentioned in order to minimize possible objections. First, the hierarchical ordering requires less informational assumptions in comparison to the standard approach. The agent chooses according to a much simpler rule which does not require continuous comparisons at the margin (see also Gowdy, 1985, p.106). Second, there are clear signs that Menger himself would be willing to play down the significance of error and imperfect knowledge when it comes to pure economic analysis. As he writes:

"...error and imperfect knowledge may give rise to aberrations, but these are the pathological phenomena of social economy and prove as little against the laws of economics as do the symptoms of a sick body against the laws of physiology" (Menger, 1950, p.216).

Finally, other authors like Neurath and McCulloch have used similar operations in their interpretations of "Austrian formulations" without any methodological worry about compatibility (see McCulloch, 1977, p.251).

4. DEMAND ANALYSIS

Some authors and particularly Alter (1990a, 1990b) have argued that it is not always possible to derive Mengerian demand curves when a particular good satisfies more than one need.² Other authors, however, disagree and argue that it is always possible to build demand curves based on Menger's views (e.g. McCulloch, 1977 and White, 1990). White for instance, thinks that Alter is wrong in supporting the impossibility of deriving demand curves and states that "all the usual comparative-statics exercises of supply-and-demand analysis can be performed with Mengerian step-functions" (White, 1990, p.354-55). Furthermore, Alter after citing McCulloch's paper, he himself states that it demonstrates the compatibility of Menger's analysis with the indifference curves approach of the later decades (Alter, 1990a). Overall, if one accepts that Menger's system belongs to the general hierarchical model, then demand curves are possible as the literature has indicated (Drakopoulos, 1994).

The above Mengerian system of choice has a number of implications for demand analysis. The simplest starting point is to discuss the above ideas in terms of a demand expenditure function. If demand is based on hierarchical needs then this implies that there is a fixed order 1,2,...,i, i+1,... of needs so that the demand turns from i to i+1 when the threshold (t_i^*) for the next need is reached. Following Falkinger (1990), the individual expenditure function d_k for the k-th good which corresponds to need k, is the following (for simplicity we just assume that no good can satisfy more than one need).

$$\text{If } y < \sum_{i=1}^{k-1} p_i t_i^* \quad \text{then } d_k = 0$$

$$\text{If } \sum_{i=1}^{k-1} p_i t_i^* < y < \sum_{i=1}^k p_i t_i^* \quad \text{then } dk = y - \sum_{i=1}^{k-1} p_i t_i^*$$

$$\text{If } \sum_{i=1}^k p_i t_i^* < y \quad \text{then } dk = p_k t_k^*$$

Where y is income, and p is prices. It is also possible to get aggregate demand expenditure functions having as a basis the above.³

We can also construct individual demand curves from the preference systems that were presented. Specifically, the introduction of budget lines here can give us the demand curves. In particular, budgetary situations and quasi-indifference curves resemble sub-optimal or corner solutions in the theory of exchange. Gorman has set the additional assumptions required for the analysis in budgetary situations and for the derivation of the demand curves. The main postulates are: convexity, absence of neuroses, and uniqueness (see Gorman 1971).

It is easy to see that if the consumer has an income constraint which (for high prices of x) is less than the price of the necessary goods, the demand curve for good x , or for the category of goods x , will be curved up to a point and then it will become vertical. (If there is no income constraint the shape of the demand curve will be, as shown in figure 3, to the right of x^* , plus a vertical section at $x = x^*$ in place of the curve.)

This can be described by step-functions as White (1990) has indicated in the process of his critique of Alter's objections concerning Mengerian demand curves:

$$x_1 = Y/p_1 \text{ for } x_1 < x^*$$

$$x_1 = a - bp_1 \text{ for } x_1 > x^* \quad (\text{with } a, b > 0)$$

where Y is income and p_1 is price of good x_1 .

As the price of x falls the agent consumes more but once he or she reaches point x^* (threshold) then a further fall in prices will not result in a higher consumption of x . The point of the kink coincides with the point where the second criterion becomes important and this is a general result of the model (Drakopoulos, 1992).

It is also possible to have a multi-kinked demand curve if the same good or the same category of goods can satisfy more than one need. Going back to Menger's example, food is assumed to satisfy the need to eat but also the higher need of entertainment. Following Menger, the need to eat is a primary one but the entertainment is a secondary one. The demand curve for food then will have a kink at the threshold point which is due to the fact that agents put priority in buying other goods (i.e. clothes) which satisfy the immediately higher need. However, when the

immediately higher need has been satisfied, the need of taste comes into the picture. Food can satisfy this need and this implies that this category of commodity acquires importance again. Assuming that the threshold points are the started variables the demand will be as shown in figure 4.

Figure 3

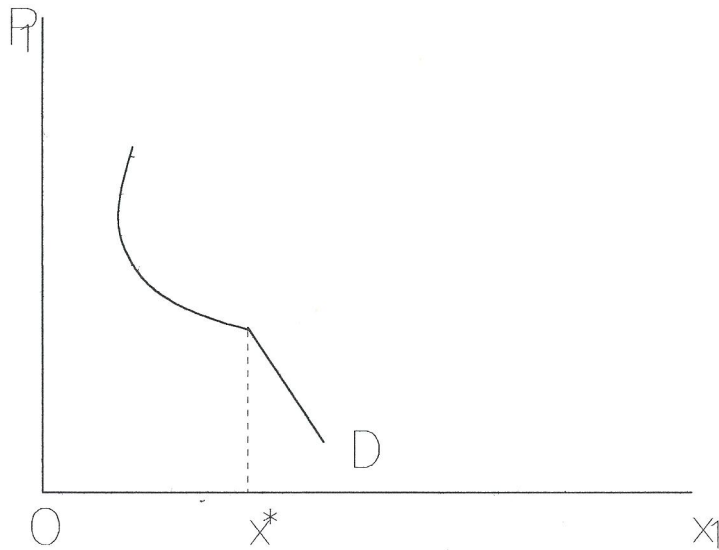
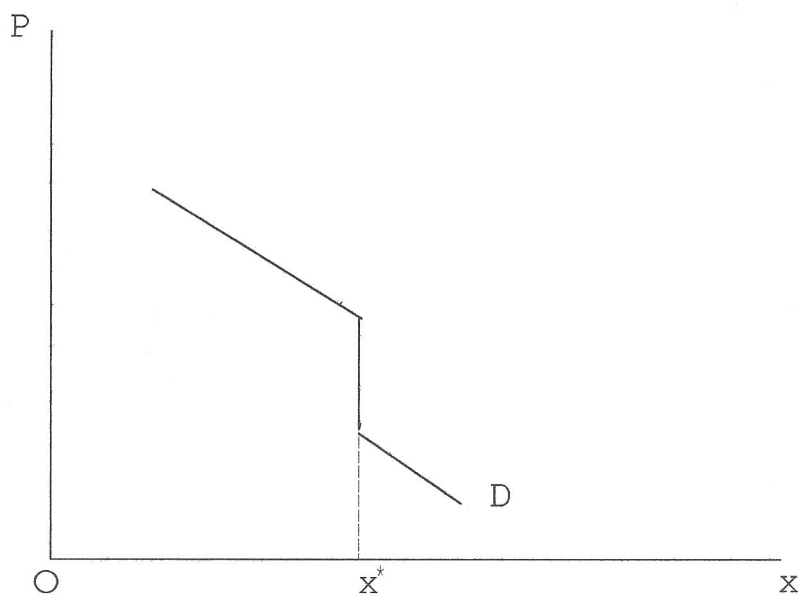


Figure 4



The most important point of the above analysis of individual demand curves is that the Mengerian approach leads to kinked or multikinked demand curves (not necessarily linear) with kinks representing the relative efficacy of goods in satisfying different needs (Earl, 1983). The general theoretical foundations and the analysis of the construction of kinked demand curves arising from hierarchical preferences has been studied extensively in the relevant literature (e.g. Encarnacion, 1964, Fishburn, 1974, Ironmonger, 1972, Day and Robinson, 1973, Drakopoulos, 1992, 1994).

One could also support the view that the aggregate demand curves will exhibit kinks. However, it may be argued that, there is a possibility that the kinks will cancel out in the aggregate if we take into account the different points at which the threshold occurs. One can, however, maintain that it is quite possible that the threshold levels might be similar for certain categories of goods (necessary and luxury goods) for large groups of the population with similar incomes (see also Little, 1957; Georgescu-Roegen, 1966; Akerlof and Yellen, 1985; Earl, 1986 and Drakopoulos, 1992). Furthermore, similar threshold levels for groups with similar incomes might be combined with different levels for groups with different incomes in order to identify distinctive market segments. This procedure might also be applied in a intercountry level as for instance in the European Union.⁴ The significance of kinked or multikinked demand curves from both the microeconomic and the macroeconomic viewpoint has been studied by a number of theorists (for a review see Reid, 1981; Blanchard and Fischer, 1989). Although it is theoretically possible to get kinked demand curves from the traditional marginalist theory, the important point here is that demand curves originate from a differently structured consumer theory which is based on Menger's views.

5. CONCLUSION

The issue of Menger's consumer theory has not received enough attention in spite of the existence of a few articles which discuss it in passing. Thus although some authors have pointed out the non-marginalist nature of Menger's approach, this paper demonstrates the important points of difference in the format of modern analysis. In particular, it was seen that Menger's starting point was the concept of human needs, and more importantly, the irreducibility of the human needs. This implies a hierarchical system in which primary needs are satisfied first and in which goods, or categories of goods, correspond to particular needs. The paper demonstrated the preference systems which describe the above. There was also a connection with similar subsequent work by other economists. The paper then examined the implications of Menger's ideas for the theory of Demand. After a discussion of the implications in terms of demand expenditure, it was shown that Menger's conception might result in kinked or multikinked demand curves.

In general, the paper, by building on existing work on Menger's theory of needs provides formal choice theory foundations and subsequent construction of demand curves. Furthermore the paper reinforces the relatively recent idea that Menger's economic thought cannot be placed in the marginalist framework, since his ideas on consumer behaviour imply different structure and also have different consequences than the standard marginalist approach. It might also be maintained that it can provide insight to our further understanding of Menger's economics.

NOTES

- 1) Menger used diagrams to explain the formation and fluctuation of prices. According to Yagi (1993, p.713), he was directly influenced in this respect by K. H. Rau.
- 2) Alter sees Ironmonger's linear programming approach as a possible way out in this case (Ironmonger, 1972).
- 3) For simplicity we can assume identical nominal saturation levels, $t = p_k t_k^*$ (see Falkinger, 1990). Thus the above reduces to:

If $y < (k - 1)t$ then $dk(y) = 0$

If $(k - 1)t \leq y < k_t$ then $dk(y) = y - (k - 1)t$

If $kt \leq y$ then $dk(y) = t$

The aggregate demand expenditure can be written

$$D_k = \int_{y_0}^{y_m} dk(y)n(y)dy$$

Where $n(y)$ is the number of individuals with income level y , y_m is the highest income, and y_0 is the lowest income.

- 4) I am grateful for this point to an anonymous referee.

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