



Human needs and utility maximization

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Abstract

Purpose – The purpose of this paper is to provide alternatives to the economic man image of human behavior and incorporate these alternative images which are based on motivational needs into utility analysis.

Design/methodology/approach – Empirically derived psychological variables define the individual's personality type in terms of an altruistic or non-altruistic orientation. These variables are incorporated into the individual's utility function, and an analysis is made of utility maximization based on human needs.

Findings – Behavioral and motivational characteristics of individuals are relatively constant and are a function of the underlying personality traits of the individuals. Empirical support is offered for these characteristics, they are incorporated into the individual's utility function, and an analysis is performed on the interactions between individuals.

Originality/value – This paper not only goes beyond the economic man image of human behavior to analyze altruistic and selfish behavior but also analyzes the utility functions of both potential donors and recipients.

Keywords Altruism, Utility theory, Human nature, Economic theory, Social interaction

Paper type Conceptual paper

Research that has emerged in recent years is concerned with the existence and behavioral implications of utility interdependence in order to provide alternatives to economic models based on the assumption of the economic man. The economic man is one who has insatiable wants and who strives for maximum satisfaction with minimum sacrifice and effort in the attainment of more goods or monetary rewards accruing to him exclusively. Being a rational and objective maximizer, he must balance the utilities he gains from monetary rewards against the disutilities he experiences in the pursuit of them. The economic man's satisfaction is independent of the income or satisfaction of anyone else, and, in fact, his relationships with others are undefined. The economic man assumption does not deal with man's relationship with people or with their goods, but only with his own goods.

A number of economists argue that the economic man is a reasonable representation of human behavior in a competitive market economy where the individual's behavior is rewarded. In addition, the economic man assumption may be a necessary simplification. Bowles and Gintis (2000) demonstrate that the Walrasian model would not hold if it were not based on the self-interested and rational economic man assumption.

However, if the economic man is not considered to be a valid image of man, then alternative images of man should be explored. An attempt should be made to offer empirical support for the assumptions regarding the behavioral and motivational



characteristics of individuals rather than simply assuming that they correspond to those of the economic man. In addition, these behavioral characteristics and motivations should be explicitly incorporated into economic analysis.

The impetus behind the development of interdependent utility models is the inability of economic models based on the assumption of economic man with his strictly private utility function to effectively address crucial questions relating to income redistribution and other altruistic forms of behavior among individuals (Becker, 1976; Daly and Giertz, 1972; Hochman and Rodgers, 1969; Valavanis, 1958). This research represents a significant advance, but it has several shortcomings. One of the primary shortcomings is that individual preferences are simply assumed to be of a certain nature, and no explanation is given for the formation of preferences.

Additional areas of study utilize game theory to argue that individuals care about equity and have an aversion to inequity such as the contributions of Fehr and Schmidt (1999). They argue that individuals are unhappy with inequitable outcomes whether those outcomes help or hurt them and will try to minimize such outcomes. Individuals are even willing to forego their own gain to prevent someone else from receiving an unjust reward. It has been shown that individuals display these behaviors in experimental games such as the “dictator”, “ultimatum”, and “trust” games. Thus, an individual’s behavior in bilateral bargaining situations differs from his behavior in competitive markets. The authors argue that fairness motives do affect an individual’s behavior. However, they have also demonstrated that in certain environments, fair-minded individuals may behave in a selfish manner. Therefore, the economic environment plays a major role in the outcomes.

Bolton and Ockenfels (2000) also argue that the individual’s utility depends not only on the individuals own payoff but also on the fairness of the outcome. Performing experimental games, they argue that although individuals want a higher monetary payoff, they also want their payoff to be as close to the average payoff of all individuals as possible.

Another important contribution comes in the work of Kenneth Binmore who offers a scientific approach to justice and morals, using game theory and applying it to John Rawls’ original position. He argues that cultural evolution produces a particular set of norms of fairness in which society operates. Human morality is a product of evolution, thus providing a scientific basis for the origin and evolution of moral rules (Binmore, 2005).

Experimental economics provides important insights into human behavior, but its focus is on how people behave in particular situations which also are dependent on what others do and on others’ economic situations. As these variables change, so does the behavior of the individuals involved.

These studies do not analyze the underlying personality traits of the individuals. Psychologists tend to view personality and motivation as constant and not fluctuating depending on one’s economic situation or on what others do or other people’s economic situations. Motivations are an inherent part of an individual’s personality and therefore relatively unchanging from one situation to the next.

The purpose of this article is to seek to offer an alternative to other approaches. In this article, two empirically derived psychological motivation variables for giving and receiving will be analyzed which, when considered in combination, define an individual’s personality type in terms of his altruistic or non-altruistic orientation. These needs will then be incorporated into the individual’s utility function,

and an analysis is made of utility maximization based on human needs. Although a number of studies have examined the notion of altruism and benevolence such as the pioneering research of Bardi and Schwartz, there has been a lack of studies which analyze motivation from the recipient's point of view (Bardi and Schwartz, 2003). Are recipients of altruistic actions favorable or unfavorable to being the object of others' altruistic behavior? This article seeks to incorporate the motivations of both donor and recipient.

Motivational needs for giving and receiving have been extensively analyzed by psychologist Ribal (1962, 1963) who has defined social character types in terms of these psychological needs. His purpose is to define "selfishness" and "altruism" scientifically and non-moralistically as normal social-psychological variables of personality and social interaction so that the variables can be used for the purpose of empirical research. Ribal (1962, p. 2) conducts an investigation of:

[...] reasonably normal men and women who have come to exhibit four types of personality polarity in their attitudes toward themselves and others which result in particular forms of human relationships.

Individuals reveal four basic motivational patterns. The personality needs which define these patterns are the need for nurturance which represents the motivational "need to give" and the need for succorance which represents the motivational "need to receive." The need for nurturance is defined as the need to help friends when they are in trouble, to assist others less fortunate, to treat others with kindness and sympathy, to forgive others, to do small favors for others, to be generous with others, to sympathize with others who are hurt or sick, to show a great deal of affection toward others, and to have others confide in one about personal problems. The need for succorance is defined as the need to have others provide help when in trouble, to seek encouragement from others, to have others be kindly, to have others be sympathetic and understanding about personal problems, to receive a great deal of affection from others, to have others do favors cheerfully, to be helped by others when depressed, to have others feel sorry when one is sick, and to have a fuss made over one when hurt (Ribal, 1962).

The Edwards Personal Preference Schedule is used to measure the personality needs of the subjects[1]. In interpreting the test scores of his research sample, Ribal uses two types of reference. The first is an assessment of the relative strength of the giving-receiving motivational needs within the person for each of the four personality types. Second, the scores are interpreted for each personality type relative to the strength of each need in the college student norms.

Based on these psychological needs for giving and receiving, four personality models emerge: the altruistic self, the selfish self, the receptive-giving self, and the inner-sustaining self. They are defined in terms of four possible combinations of high and low needs for nurturance and succorance, and the typology is presented schematically as follows (Ribal, 1962, p. 4) (Table I).

The typology of personality orientation delineating altruistic, selfish, receptive-giving, and inner-sustaining individuals provides a meaningful conceptualization for analyzing the giving-receiving patterns of individuals. As Ribal (1962, p. 207) points out:

The common tendency to describe personality simply in terms of a single scale having altruism at one end and selfishness at the other is an obvious distortion of the real character

of man's variable needs both to receive and to give [...] It is necessary to identify both types of inner-impulse to fully account for motivation and behavior. The typology calls attention to the four basic modes of responsiveness an individual may exhibit in his social relationships [...] This subject should be rewarding for not only the personality theorist and researcher, but the individual who simply wishes to think more meaningfully about himself and his fellow man.

Ribal's research has not only provided data relating to the four types of personality, it has also explored the connection between personality motivations and specific kinds of socialization processes, concentrating upon early aspects of socialization of the individual in trying to account for the various combinations of succorance and nurturance needs. Parent-child relationships appear to be particularly important in the development of the observed personality patterns. Ribal has noted that one of the primary reasons that social research can be carried out is the fact that people often share the same motivations and somewhat similar patterns of behavior. As Ribal (1962, p. 209) points out:

[...] these patterns are not always inviolate, but somewhere between complete sameness and random uniqueness there are commonalities so general that they must be recognized as significant and useful for understanding.

The altruistic self

Altruistic persons do exist in American society in the sense that a number of individuals are highly motivated to want to support and aid others, but have little or no motivational need for a similar type of responsiveness from others. In addition, there does not appear to be anything abnormal in a social or psychological sense about their attributes. The autobiographical data on the altruistic individuals indicate that they tend to come from large families, and that they have often been expected to care for younger siblings. The rewards of parental and social approval seem to have been important in developing the high need for nurturance. However, not all children develop altruistic motivation under such circumstances but instead develop a negative reaction to those requiring nurturance, possibly as a result of the failure of some parents to reward the child for nurturant responsiveness. Being placed in charge of younger siblings often has other consequences, one of which is the tendency to identify with adults who often display altruistic qualities with respect to their children. This social prematurity often leads to the development of individual self-sufficiency. Thus, the act of caring for others seems to generally reduce the individual's dependency upon others, resulting in the low need for succorance. This does not mean that the altruistic person does not seek any "compensation" for his nurturance because altruists generally have a desire to be appreciated and approved, but they are usually satisfied by symbolic rewards of some type rather than by reciprocal acts of nurturance.

The altruistic self

High needs to give to others (nurturance-high)
Low needs to receive from others (succorance-low)

The receptive-giving self

High needs to give to others (nurturance-high)
High needs to receive from others (succorance-high)

The selfish self

Low needs to give to others (nurturance-low)
High needs to receive from others
(succorance-high)

The inner-sustaining self

Low needs to give to others (nurturance-low)
Low needs to receive from others
(succorance-low)

Table I.

In addition, there is little indication that altruistic individuals are looking for sympathy in their altruistic activities or that they are motivated by guilt or a desire to suffer. They simply find pleasure in giving to others. The altruist's low need for succorance stemming from his early development of self-sufficiency is continuously reinforced from the experience of helping others (Ribal, 1962, p. 51).

The selfish self

This group of individuals has scores on nurturance and succorance falling in just the reverse quartiles from the altruistic group. It is interesting to note that only a slightly larger number were classified as selfish than were classified as altruistic. The selfish individual gains pleasure in being supported and aided by others but is not motivated to respond to others in a similar manner. The selfish individual is capable of forming mutually satisfying relationships primarily with individuals who have a high need to give but not to receive, i.e. the altruists. The selfish individual evidences a considerable amount of dependency upon others who are nurturing, including parents, who tended to be consistently over-indulgent. It is interesting to note that none of the selfish individuals described himself as "selfish". While they were somewhat willing to concede the validity of their high scores on the need for succorance, they objected to their low scores on nurturance. Although there is a tendency to view the selfish individuals in a negative light, they are not socially deficient from a behavioristic point of view. They are capable of being part of social relationships if these relationships provide support for individuals of their type, and they adjust fairly well to the groups of which they are a part (Ribal, 1962, p. 108).

The inner-sustaining self

The inner-sustaining individual engages in forms of interaction that avoid the necessity of either nurturance or succorance. This type of person does not often require help from others, and even when his circumstances indicate an objective need for assistance, there is a tendency to accept aid only as a last resort, and then with a great deal of reluctance because of its threat to his feelings of personal adequacy (Ribal, 1962, p. 41).

Inner-sustaining men and women are often not viewed by others in the same manner because of differences in cultural expectations regarding gender roles. Inner-sustaining men are often more easily accepted by others because they fulfill the common American male stereotype which perceives men as having low nurturance and low succorance. The stereotype of women, however, tends to be one of high nurturance and high succorance, and the inner-sustaining female is just the opposite of this female stereotype. The difference in attitudes toward the inner-sustaining individuals according to gender is important because it helps to explain the defensiveness of many of the inner-sustaining women. While the inner-sustaining men are often defensive in protecting their needs for autonomy and independence, their defensiveness is usually directed to specific individuals who attempt to violate or encroach upon these needs. The inner-sustaining woman, however, tend to manifest a generalized state of defensiveness which is directed at the world in general – at anyone who plays a hand in keeping women boxed in the traditional female roles (Ribal, 1962, p. 143).

Inner-sustaining individuals are considerably less influenced by peer groups than the other three personality types. They are not motivated to forego their own interests for those of the group, and they also have misgivings about any group's efforts to assist

them because they feel this will generate expectations of reciprocity from the group which will obligate them. Inner-sustaining individuals often engage in individualized, rather than group, activities. They appear to reflect some of the traditional ideological imprint of American culture with respect to low succorance and low nurturance which encourages individuals to look out for themselves. There are a number of distinctive features that relate to the course of development of the inner-sustaining individual. Inner-sustaining individuals generally experience a long period of conflict with parents who have unsuccessfully attempted to change the orientation of their children with respect to succorance and nurturance. The reaction of these individuals is to disassociate themselves physically, socially, and psychologically from the home, and to reject the nurturance from their parents because they view it as a symbol of weakness and inadequacy (Ribal, 1962, pp. 149, 152).

The receptive-giving self

Individuals in this category have a high motivational need to have others support and aid them, as well as a high motivational need to respond to others in a similar manner. Receptive-giving individuals differ from altruistic individuals in that they tend to depend upon others to some degree for maintaining physical, psychological, and social states of well-being. However, unlike selfish individuals, they are also motivated toward gratifying the needs of others.

Receptive-giving individuals generally come from large, closely knit families who are organized along old traditional lines. The receptive-giving individual learns to depend upon the family for most of his physical, social, and psychological needs. At the same time, he learns a sense of responsibility and obligation to family members. The father is often extremely dominant over other members of the family. The mother tends to be very supportive with respect to the children. There is a considerable amount of maternal overprotection and overindulgence, and the development of this dependency relationship seems to be important in producing the high need for succorance. The family tends to be very religious, and this factor plays a very significant role in producing and reinforcing a high need for nurturance (Ribal, 1962, p. 114).

Utility maximization when personality types interact

The motivational needs for giving and receiving are manifested not only in an individual's non-economic human relationships with others but apply to his economic relationships as well. The motivational needs for giving and receiving express themselves in the individual's attempts to obtain social and psychological as well as physical states of well-being. Thus, the individual's motivational pattern in terms of giving and receiving will be reflected in his utility function.

With the addition of the economic man as a personality type, there are 15 possible combinations of two types of individuals. For illustrative purposes, only three of the combinations will be analyzed. I will assume a two-person world of utility maximizing individuals, all transfers are voluntary, there are fixed quantities of goods, the utility functions are additive, and second-order conditions for optimality are fulfilled.

The altruist and the selfish self

The case of the altruist and the selfish individual represents one of the most harmonious combinations possible in terms of motivational needs for giving and receiving. The altruist has a high need to give and a low need to receive whereas the selfish

individual has a high need to receive but a low need to give. Their complementary needs lead to a mutually satisfying relationship.

Since the selfish individual will not make voluntary transfers to the altruist, the altruist's utility function can be expressed as:

$$U^A = f(X_1^A, \dots, X_n^A) + g(X_1^{AST}, \dots, X_n^{AST}) \quad (1)$$

where (X_1^A, \dots, X_n^A) denotes the quantity of goods retained by the altruist, and $(X_1^{AST}, \dots, X_n^{AST})$ denotes the quantity of goods transferred to the selfish individual by the altruist. Letting $X_i^{A(0)}$ denote A's endowment of each good, then:

$$\begin{aligned} X_1^A &= X_1^{A(0)} - X_1^{AST} \\ &\vdots \\ X_n^A &= X_n^{A(0)} - X_n^{AST} \end{aligned} \quad (2)$$

In analyzing the utility function of the selfish individual, it is important to realize that for this personality type, it is not only the fact of having more goods as a result of receiving a transfer that will make him happier, but also of great importance to him is the fact that these goods were given to him by someone else, thus satisfying his high need for succorance.

The utility function of the selfish individual is:

$$U^S = F(X_1^S, \dots, X_n^S) + H(X_1^{ST}, \dots, X_n^{ST}) \quad (3)$$

where (X_1^S, \dots, X_n^S) denotes the quantity of his own goods which were not received in the form of a transfer, and $(X_1^{ST}, \dots, X_n^{ST})$ denotes the quantity of goods that are received by him in the form of a transfer from the altruist. Letting $X_i^{S(0)}$ denote S's endowment of each good:

$$\begin{aligned} X_1^S &= X_1^{S(0)} \\ &\vdots \\ X_n^S &= X_n^{S(0)} \end{aligned} \quad (4)$$

and:

$$\begin{aligned} X_1^{ST} &= X_1^{AST} \\ &\vdots \\ X_n^{ST} &= X_n^{AST} \end{aligned} \quad (5)$$

The utility of the altruist can be maximized subject to the constraint that the utility of the selfish individual is constant, so:

$$\left[U_0^S - F(X_1^S, \dots, X_n^S) - H(X_1^{ST}, \dots, X_n^{ST}) \right] = 0, \quad (6)$$

the following function is formed:

$$U^A = f(X_1^A, \dots, X_n^A) + g(X_1^{AST}, \dots, X_n^{AST}) + \lambda \left[U_0^S - F(X_1^S, \dots, X_n^S) - H(X_1^{ST}, \dots, X_n^{ST}) \right] \quad (7)$$

and the partial derivatives are set equal to zero:

$$\begin{aligned} \frac{\delta U^A}{\delta X_1} &= -f_1 + g_1 - \lambda(F_1 + H_1) = 0 \\ &\vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \\ \frac{\delta U^A}{\delta X_n} &= -f_n + g_n - \lambda(F_n + H_n) = 0 \end{aligned} \quad (8)$$

The marginal utility of the selfish individual from goods that are transferred to him, denoted H_i , consists of two effects which are both positive – a real effect denoted $H_{i,r}$ and a psychological effect denoted $H_{i,p}$. The real effect denotes the satisfaction the selfish individual gains simply from the goods themselves. The positive psychological effect results from his high need for succorance which the receipt of these goods in the form of a gift serves to satisfy. Thus, to the selfish individual, the act of receiving a gift may play just as important a part, and perhaps even a more important part, in increasing his utility than does the good itself:

$$H_i = H_{i,r} + H_{i,p} \quad (9)$$

Substituting equation (9) into equation (8) yields:

$$\begin{aligned} \frac{\delta U^A}{\delta X_1} &= -f_1 + g_1 - \lambda(F_1 + H_{1,r} + H_{1,p}) = 0 \\ &\vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \\ \frac{\delta U^A}{\delta X_n} &= -f_n + g_n - \lambda(F_n + H_{n,r} + H_{n,p}) = 0 \end{aligned} \quad (10)$$

As there are only one-way transfers, for each commodity, the optimum is:

$$g_i - f_i = F_i + H_{i,r} + H_{i,p} \quad (11)$$

where $g_i > 0$, $f_i > 0$, $F_i > 0$, $H_{i,r} > 0$, and $H_{i,p} > 0$. Since the initial endowment (X_1^S, \dots, X_n^S) of the selfish individual is independent of the altruist, it can therefore be considered constant, and the optimum simplifies to:

$$g_i - f_i = H_{i,r} + H_{i,p}. \quad (12)$$

The left-hand side of equation (12) is the altruist's marginal utility from transferring goods to the selfish individual less the altruist's marginal utility from retaining

the goods. For optimality, this must equal the selfish individual's marginal utility from receiving transfers as represented by the right-hand side of the equation.

The altruist and the inner-sustaining self

The altruist and the inner-sustaining individual have one characteristic in common – a low need to receive. On the other hand, the altruist has a high need to give, and the low need to receive of the inner-sustaining individual results in a combination of personalities which is not extremely compatible.

Since the inner-sustaining individual will not voluntarily transfer goods to the altruist, the altruist's utility function is:

$$U^A = f(X_1^A, \dots, X_n^A) + g(X_1^{AIT}, \dots, X_n^{AIT}) \tag{13}$$

where (X_1^A, \dots, X_n^A) denotes the quantity of goods retained by the altruist, and $(X_1^{AIT}, \dots, X_n^{AIT})$ denotes the quantity of goods transferred to the inner-sustaining individual by the altruist. Letting $X_i^{A(0)}$ denote A's endowment of each good, then:

$$\begin{aligned} X_1^A &= X_1^{A(0)} - X_1^{AIT} \\ &\vdots \quad \vdots \quad \vdots \quad . \\ X_n^A &= X_n^{A(0)} - X_n^{AIT} \end{aligned} \tag{14}$$

The utility function of the inner-sustaining individual is:

$$U^I = F(X_1^I, \dots, X_n^I) + H(X_1^{IT}, \dots, X_n^{IT}) \tag{15}$$

where (X_1^I, \dots, X_n^I) denotes the quantity of his own goods, and $(X_1^{IT}, \dots, X_n^{IT})$ denotes the quantity of goods received by him in the form of a transfer. Letting $X_i^{I(0)}$ denote I's endowment of each good, then:

$$\begin{aligned} X_1^I &= X_1^{I(0)} \\ &\vdots \quad \vdots \\ X_n^I &= X_n^{I(0)} \end{aligned} \tag{16}$$

and:

$$\begin{aligned} X_1^{IT} &= X_1^{AIT} \\ &\vdots \quad \vdots \quad . \\ X_n^{IT} &= X_n^{AIT} \end{aligned} \tag{17}$$

The utility of the altruist can be maximized subject to the constraint that the utility of the inner-sustaining individual is constant, so:

$$\left[U_0^I - F(X_1^I, \dots, X_n^I) - H(X_1^{IT}, \dots, X_n^{IT}) \right] = 0, \quad (18)$$

the following function is formed:

$$U^A = f(X_1^A, \dots, X_n^A) + g(X_1^{AIT}, \dots, X_n^{AIT}) + \lambda \left[U_0^I - F(X_1^I, \dots, X_n^I) - H(X_1^{IT}, \dots, X_n^{IT}) \right] \quad (19)$$

and the partial derivatives are set equal to zero:

$$\begin{aligned} \frac{\delta U^A}{\delta X_1} &= -f_1 + g_1 - \lambda(F_1 + H_1) = 0 \\ &\vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \\ \frac{\delta U^A}{\delta X_n} &= -f_n + g_n - \lambda(F_n + H_n) = 0 \end{aligned} \quad (20)$$

If the inner-sustaining individual receives a transfer of goods from the altruist, the marginal utility of the inner-sustaining individual from the transfer denoted H_i consists of two effects – a positive real effect denoted $H_{i,r}$ and a negative psychological effect denoted $H_{i,p}$. The positive real effect represents the increase in satisfaction from having a larger quantity of goods. The negative psychological effect represents the psychic dissatisfaction he experiences from the act itself of being the recipient of a transfer. The net effect may be positive, negative or zero:

$$H_i = H_{i,r} + H_{i,p} \quad (21)$$

Substituting equation (21) into equation (20) yields:

$$\begin{aligned} \frac{\delta U^A}{\delta X_1} &= -f_1 + g_1 - \lambda(F_1 + H_{1,r} + H_{1,p}) = 0 \\ &\vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \\ \frac{\delta U^A}{\delta X_n} &= -f_n + g_n - \lambda(F_n + H_{n,r} + H_{n,p}) = 0 \end{aligned} \quad (22)$$

As there are only one-way transfers, for each commodity, the optimum is:

$$g_i - f_i = F_i + H_{i,r} + H_{i,p} \quad (23)$$

where $g_i > 0$, $f_i > 0$, $F_i > 0$, $H_{i,r} > 0$, and $H_{i,p} < 0$. Since the initial endowment (X_1^I, \dots, X_n^I) of the inner-sustaining individual is independent of the altruist, it can therefore be considered constant, and the optimum simplifies to:

$$g_i - f_i = H_{i,r} + H_{i,p}. \quad (24)$$

Thus, for optimality, the altruist's marginal utility from transferring goods to the inner-sustaining individual less the altruist's marginal utility from retaining the goods must equal the inner-sustaining individual's marginal utility from receiving transfers. This implies that if transfers are to occur, the positive real effect on the utility

of the inner-sustaining individual from receiving transfers must outweigh the negative psychological effect.

The receptive-giving self and the economic man

In this combination of individuals, the receptive-giving individual is able to satisfy his motivational need to give, but since the economic man will not voluntarily make transfers to anyone, the receptive-giver gains no satisfaction for his high motivational need to receive.

Since the economic man E will not voluntarily make transfers to the receptive-giver R , R 's utility function can be expressed as follows:

$$U^R = f(X_1^R, \dots, X_n^R) + g(X_1^{RET}, \dots, X_n^{RET}) \tag{25}$$

where (X_1^R, \dots, X_n^R) denotes the quantity of goods retained by R , and $(X_1^{RET}, \dots, X_n^{RET})$ denotes the quantity of goods transferred to the economic man by R . Letting $X_1^{R(0)}$ denote R 's endowment of each good:

$$\begin{aligned} X_1^R &= X_1^{R(0)} - X_1^{RET} \\ &\vdots \quad \vdots \quad \vdots \quad \cdot \\ X_n^R &= X_n^{R(0)} - X_n^{RET} \end{aligned} \tag{26}$$

The utility function of the economic man E is:

$$U^E = F(X_1^E, \dots, X_n^E) \tag{27}$$

where (X_1^E, \dots, X_n^E) denotes the total quantity of his own goods. Letting $X_1^{E(0)}$ denote E 's endowment of each good and X_1^{ET} denote the quantity of each good transferred to E by R , then:

$$\begin{aligned} X_1^E &= X_1^{E(0)} + X_1^{ET}, \quad \text{where } X_1^{ET} = X_1^{RET} \\ &\vdots \quad \vdots \quad \vdots \quad \quad \quad \vdots \quad \vdots \quad \cdot \\ X_n^E &= X_n^{E(0)} + X_n^{ET}, \quad \text{where } X_n^{ET} = X_n^{RET} \end{aligned} \tag{28}$$

The utility of the receptive-giver can be maximized subject to the constraint that the utility of the economic man is constant, so:

$$\left[U_0^E - F(X_1^E, \dots, X_n^E) \right] = 0, \tag{29}$$

the following function is formed:

$$U^R = f(X_1^R, \dots, X_n^R) + g(X_1^{RET}, \dots, X_n^{RET}) + \lambda \left[U_0^E - f(X_1^E, \dots, X_n^E) \right], \tag{30}$$

and the partial derivatives are set equal to zero:

$$\begin{aligned} \frac{\delta U^R}{\delta X_1} &= -f_1 + g_1 - \lambda F_1 = 0 \\ &\vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \\ \frac{\delta U^R}{\delta X_n} &= -f_n + g_n - \lambda F_n = 0 \end{aligned} \quad (31)$$

As there are only one-way transfers, for each commodity, the optimum is:

$$g_i - f_i = F_i \quad (32)$$

where $g_i > 0, f_i > 0$, and $F_i > 0$. Thus, for optimality, the receptive-giver's marginal utility from transferring goods to the economic man less the receptive-giver's marginal utility from retaining the goods must equal the economic man's marginal utility from receiving transfers.

Concluding comments

In the area of welfare analysis, alternatives to the economic man image are being sought by economists who are dissatisfied with the ability of models based on the economic man to adequately deal with the question of income redistribution and altruistic behavior. A substantial amount of research has emerged concerned with the existence and behavioral implications of utility interdependence. In addition, the utilization of game theory has emerged to argue that individuals care about equity. One of the primary shortcomings of the new areas of research is that they either assume preferences to be of a certain nature or they assume that preferences are a function of the economic environment in which the individual operates.

It was argued in this analysis that behavioral and motivational characteristics of individuals are relatively constant and are a function of the underlying personality traits of the individuals. Moreover, they should be explicitly incorporated into economic analysis. In addition, empirical support should be offered for the motivational assumptions that underlie the image of man. In this paper, psychological aspects of human behavior and motivation were incorporated into utility functions, and a theoretical analysis was performed on the interactions between individuals.

Note

1. The normative test scores are from samples of 1,509 college students (749 females and 760 males) from 29 colleges located throughout the USA (Edwards, 1959).

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