

## The Humanomic Structure of Islamic Economic Theory: A Critical Review of Literature in Normative and Positive Economics

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ABSTRACT. The author reviews earlier attempts at formulating a humanistic political economy. Then a principle of Ethical Endogeneity is established which shows that society maximizes its social welfare through consensus among decision-makers with the choice of goals and policy variables. In the Islamic economy these goals and policies are uniquely set by the *shari'ah*. The principle of *tawheed* and brotherhood, of work and production and that of distributive equity characterize the Islamic economy which realises these goals through *zakah*, abolition of interest and profit-sharing.

The development of humanistic political economy has long been steeped in the controversies surrounding normative and positive economics. Positive economics came to be identified with mainstream economics. The wedge between the two schools is found to be pronounced in the works of Lionel Robbins (1935) and Milton Friedman (1953). Both have argued in favour of economic science being independent of value judgements and ethical values. Friedman emphasized the goal of mainstream economics as being the logistics for greater precision in economic predictions based on the view of the world as 'is', not as it 'ought' to be. Robbins on the other hand is the great exponent of the concept of economic rationality as the foundation of positive economics. The idea of economic rationality is well-known to centre around the properties of complete ordering and transitivity of individual or social states (Robbins 1979). In turn this

requires that the following conditions be attained: (a) perfect information of the economic universe and full-determination of the degree of risk and uncertainty behind economic events; (b) exogenous treatment of ethical considerations in the economic system. Exogeneity here means that economic philosophy under the positive school is by and large independent of value judgements, which are assumed to form outside it and is incapable of affecting the ethical parameters of the social order. Note here the claim made by Josef Schumpeter (1968, Ch. 2) that economic analysis has not been shaped at any time by the philosophical opinions that economists happen to have".

In spite of such claims by the positivists, it is a fact that economics is only one part of the social order. The preference and exchange principle of the total social order are integrative in nature as shown by Boulding (1972). Thus, in order to function in an integrated way in the total social system, economic science cannot afford to evolve *ceteris paribus*; it must evolve within the context and influences of the grand whole.

Parsons refers to the common social characteristics of consumption and production as a boundary problem of economics (Parsons 1969). Producers deliver in the product market what consumers demand. The market is thereby, capable of promoting a wide range of commodities, leaving the nature of such goods to be determined under unbridled competition and total consumer sovereignty. The ethico-economic argument in this respect is widely different. Such a system argues, that all goods produced by the production system, demanded and consumed by the consumer must be social goods. These are goods that satisfy the given ethical norms and values set by public consensus and promoted by governments, and may be produced by the private sector or the public sector. Thus, the social goods system produces and consumes such goods that not merely maximizes individual utilities and economic growth but also altruistic preferences (interdependent utilities) and social growth (Arrow 1976). Now if the boundary problem of consumption and production is a social one, it must be characterised by a large set of state (target) variables and policy (decisionastic) variables, some of which are purely economic and some non economic in nature (ethical imponderables). The choice of social goods is *coter-minus* with such variables.

The other aspect of the boundary problem is the treatment of ethical considerations as endogenous in the ethico-economic system. This means that society must be capable of evolving in loops of feedback between social state variables and social policies. Starting with initial feasible social policies and target goals, society evolves on an optimal path of perfecting its ethico-economic goals. Each phase in this optimal evolutionary path is characterized by inter-relationships between the target variables and the policy variables. An ethico-economic system therefore, shows optimal production frontiers for social goods, optimal social welfare from the consumption of social goods, optimal allocation of resources in the production of social goods and the optimal policies for attaining these with a force of innovativeness akin to the pure market economy.

## **Social Consensus in Ethico-Economic System**

Social consensus formation plays a critical role in defining the above kinds of optimality in the ethico-economic system. However, unlike the purely market orientation of consensus formation between buyers and sellers, such consensus formation initially emanates as a claim of continuing policy changes, goals, perspectives developed interactively between policy and the market place, in which the ethico economic system induces both a desired change in consumption preferences and social control of production. The idea is akin to Galbraith's Theory of Social Balance (Galbraith 1976). The theory says that society would be capable of attaining high levels of social felicity if it transfers an increasingly greater share of incomes towards the consumption, production and distribution of collective goods and services. There is however, a subtle difference between the idea of social good and Galbraith's collective good - the production and consumption of social goods are carried out in a market economy, and appropriate technology, economic cooperation, agent-agent altruism and distributive equity generate consistency between equity and efficiency, not a trade-off as envisaged in the Theory of Social Balance.<sup>(1)</sup>

The above characteristics of an ethico-economic system point out that social consensus formation and the endogenous treatment of ethical elements are consistent conditions, and because such conditions affect the consumption, production and distributional activities of the system, they are necessary ones for the existence of an ethico-economic general equilibrium (Choudhury 1987). Basic contradictions therefore arise between the nature, assumptions and methodological approaches to be found in an ethico-economic system and those in the positive economic system. Development of an ethico-economic theory is then to be based on the following two internally consistent goals, rather than on the postulates of economic rationality, conflict and competition, equity-efficiency trade-off: complete consensus formation through institutional goals and appropriate social policies that move the ethico-economic system along its optimal trajectories; treatment of ethical values as endogenous in the system. These goals define the Principle of Ethical Endogeneity. To an elaboration of this we now turn.<sup>(2)</sup>

### **Principle of Ethical Endogeneity**

In the ethico-economic theory appropriate social policies progressively transform individual consumption preferences to make them conform with social preferences (Malik 1988). The progressive conformity between individual and social preferences establishes Social Consensus. In this transformation process the endogenous nature of ethical preference is shown by the fact that with greater social consensus comes the capacity of society and individuals to evolve into yet higher levels of ethical perfection. Each attained social state through ethical transformation creates higher ethical states and in turn better social policies. The individual evolves ethically thereby and becomes the New Ethical Individual, The evolution of society to higher social states thus proceeds in cycles, from individual preferences to social preferences, forming social consensus through appropriate policy formulation and recreating the Ethical Individual.

The Principle of Ethical Endogeneity is inherent in the concept of paradigm shift, signified by value changes in society due to powerful reconceptualization in the world of philosophical, scientific, social and economic ideas. For instance, the shift from Cartesian physics to Relativity and Unitary Field Theory had likewise produced a paradigmatic shift in economics. This is shown in the powerful elements towards a reconceptualization of the economic universe away from deterministic rationalism to dynamically disequilibrium models of uncertainty and subjectivity. In such a universe economic decisions and social policies are formulated not by self-seeking optimizers, but rather by a large number of interacting agents, each cooperating, sharing and conceding to the process of learning-by-doing toward realizing the ethico-economic goals.

The Principle of Ethical Endogeneity is depicted in the following diagram (Fig. 1). The symbols of the diagram are defined below:

- E (DE): ethical goals/level first endowed and then cyclically evolved in the ethico-economic system (distributive equity as an ethical/goal);
- S (IE): state preferences (social preferences) based on given ethical goals and norms (international economic programs of development finance institutions influenced by goals of distributive equity);
- I (D): individual preferences made to conform with social preferences (domestic economy of a nation state);
- SP: social policy formulation based on ethical goals and norms (appropriate social policy orientated toward attainment of the goal of distributive equity);
- C(CS): consumption preferences associated with individual preferences (consumer goods sector, which is part of the domestic economy);
- P (IS): production menus influenced by individual consumption preferences and cooperation between capitalists and worker (investment goods sector, which is part of the domestic economy);
- D (DT): distribution of incomes and resources influenced by individual and societal preferences on consumption and production (distribution, which is part of the domestic economy);
- SS: first stage (repeated by subsequent stages) of attained social states (attained social state);
- T (ST): social transformation carrying social states to a higher level of ethical perfection/goals and recreating the Ethical Man and the ethico-economic order (social transformation commences in cycles, e.g., better economic security, lower budget deficit, greater expenditure in the social goods sector);
- SC: complete social consensus formation between decision makers (between development finance institutions and their member countries in respect to appropriate choice of social projects and consequent changes in development planning).

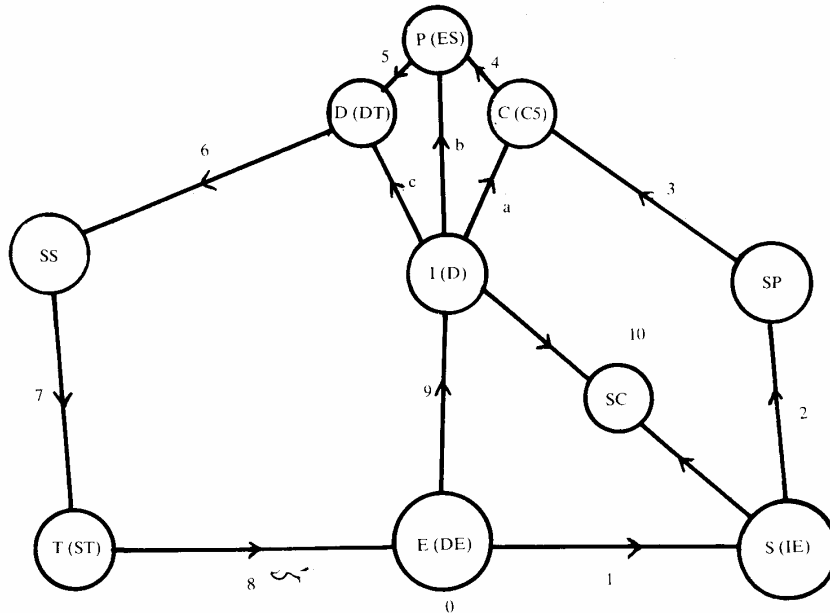


Fig I. Principle of Ethical Endogeneity

The Principle of Ethical Endogeneity, which is the distinctive feature of ethico economics makes the latter singularly different from traditional humanistic approaches to the study of political economy and welfare economics. In these studies ethical considerations appear exogenous to the socio-economic system, and are therefore, incapable of regenerating themselves and thereby influencing the system. In fact, in such a case we do not have an ethico-economic system. The endogenous treatment of ethical values is essential to the ethico-economic system, necessitating in the same order continuous development of social policies, of the New Ethical Individual and establishing social consensus between individual and social preferences.

The principle of Ethical Endogeneity has given rise to a new and distinct field of study within social economics known as Humanomics.<sup>(3)</sup> The goal of Humanomics is to discover the foundations of ethico-economics and to develop a viable policy framework addressing to some of the critical socio-economic problems confronting the world communities. The emphasis here is on searching for universal truths on which a viable ethico-economic framework of policy analysis can be built, at the exclusion of mere sectarian or temporal facts. The assumptions of Humanomics are based on consistency postulates, which do not unquestionably endorse the concept of economic rationality. The consistency criterion of humanomics is aimed at establishing coherence between the stated ethico-economic goals of a humanomic study and the assumptions and analysis of that study. The methodology of humanomics is based on discovering the quantitative or inferential answers to ethico-economic studies. This methodology expands upon the methods of the social sciences by encompassing a scientific analysis of non-economic variables as well (ethical imponderables).

## **The Principle of Ethical Endogeneity and the Humanomic Characteristics of Islamic Economics**

The Islamic economic system is perhaps the only known social order that has strong characteristics of ethical endogeneity. This is due to the unique goals and principles of this system and the set of endowed policy instruments for attaining these goals (Choudhury 1983). The fundamental principles of Islamic Economics are, the Principle of *Tawheed* and Brotherhood. The Principle of Work and Productivity and the Principle of Distributive Equity. The principle policy instruments for realizing these goals are *Zakah* (wealth tax) the abolition of *Riba* (interest), the institution of *Mudarabah* (Profit sharing) and the abolition of *Israf* (wanton consumption). These are now taken up in relation with the Principle of Ethical Endogeneity in the sections below.

The Principle of *Tawheed* (Unity of God) lays the foundation of the Islamic social order, in that it teaches man that his economic and social activities must be guided by the principles of Qur'an, which are further elaborated through the traditions of Prophet Muhammad (Sunnah). In light of this Principle the demand for goods and services is interpreted in terms of their characteristics, not in terms of quantity based consumer insatiability. The characteristics are those assumed by social goods bought and sold in the market economy and evolving through progressive stages of social transformation. The Principle of *Tawheed* and Brotherhood by bestowing final ownership of resources to God and their trusteeship to man, necessitates a characteristic theory for social production, consumption and distribution.

The Principle of Work and Productivity states that under Islamic social justice each factor of production including labour must be paid its dues at par at least with its average product, not marginal product (Choudhury 1987). If payments to factors are in excess of their marginal product, this is because the factor group as a whole has its average product higher than the marginal product.

The Principle of Work and Productivity directly relates to the Principle of *Tawheed* and Brotherhood in factor pricing under the average productivity formula, for while every factor in the factor group gets its due share, no one individual factor in the group gets below its average productivity. Under this principle some factors may be made better off while others are not made worse off as a result of distribution of resources for attaining maximal social welfare. All these appear to be standard welfare economics of public goods and Rawls' theory of justice. There are however, pronounced distinction between these approaches and the approach of Islamic economic theory towards welfare economics. Differences occur because uncertain events in Islamic decision making can be reduced to their certainty equivalent through perfect consensus formation and continuous policy simulation towards attaining the ethico-economic goals. Besides, through the Principle of Distributive Equity, which will be explained next, there is no neo-classical concept of equity-efficiency trade-off, rather only the concept of equity-efficiency consistency. For these reasons, in Islamic welfare economics the social production transformation curve and the grand social welfare frontier are strictly concave to the origin. This is a case that, on the one hand does not comply with Rawls' theory of justice, Arrow's impossibility theorem and the public goods version of social welfare maps (Rawls 1972; Arrow 1951 and Bator 1957), and

on the other hand the Islamic approach to welfare economics does not permit a straightforward acceptance of transitivity of states.<sup>(4)</sup>

The Principle of Distributive Equity is the natural corollary of the Principle of Work and Productivity. Distributive equity in Islam takes place through the instrument of *Zakah* (wealth tax) replacement of interest by profit sharing under *Mudarabah* (Islamic institution of profit sharing). It can be shown that the total social benefit function in Islamic economics is based on an income and employment multiplier relationship through which, in the *Zakah*-benefit model the total *Zakah* benefit increases for one who pays *Zakah* and for the one who receives it (Choudhury 1986). Besides, the objective of *Zakah* expenditure is to generate both ethical purging of incomes through equitable distribution as well as growth. Thus, *Zakah* cannot be considered as a mere transfer income based on the needs test, rather it is qualified on the basis of productivity test as well. In this way, the distributive equity principle based on *Zakah* aims at generating growth, productivity and income distribution through increased capital formation. Upon this the positive inter temporal effect of capital formation on economic growth is well-known. The Principle of Distributive Equity makes a departure from Rawls' theory of income distribution by adding the growth and productivity aspects of resource allocation with the income distribution formula.

The Principles of Islamic Economies are guided by some main policy instruments. These are, the institution of *Zakah*, the abolition of *Riba*, the institution of *Mudarabah* and the abolition of *Israf*

The inter-relationship among the Islamic principles and policy instruments are shown by the following diagram (Fig. II).

The diagram shows that the impact of the Islamic Economic Principles flows in a circular fashion, starting at an initial level of *Tawheed* and Brotherhood (signifying an Islamic society endowed with given levels of *Taqwa* and Islamic organization), and in a circular loop establishing higher levels of ethical perfection in the evolving Islamic society. Then, there are the impact of the policy instruments on the Principles as shown, pointing out the two levels of interactions here. On the one side, the policy instruments evolve in a circular fashion relating to the Principle of *Tawheed* and Brotherhood. On the other side, the policy instruments have a one directional effect on the other two Principles. This means that an Islamic society is capable of evolving into progressively higher levels of ethical perfection only through strengthening of the Principle of *Tawheed* and Brotherhood. This in turn influences the other Principles and interacts with the policy instruments. The result of this interaction is the improved influenced of the policy instruments on all the Islamic Principles.

The Principle of Ethical Endogeneity is brought out in the above inter-relationships among the Islamic Principles and Policy Instruments.<sup>(5)</sup> The diagram shows that the Islamic society is capable of evolving into higher stages of ethical perfection through the force of better social policies at any point of time, and which in turn are created by the prevailing strength of *Tawheed* and Brotherhood in the Islamic Society. The social state and policy variables recreate themselves through such inter relationships.

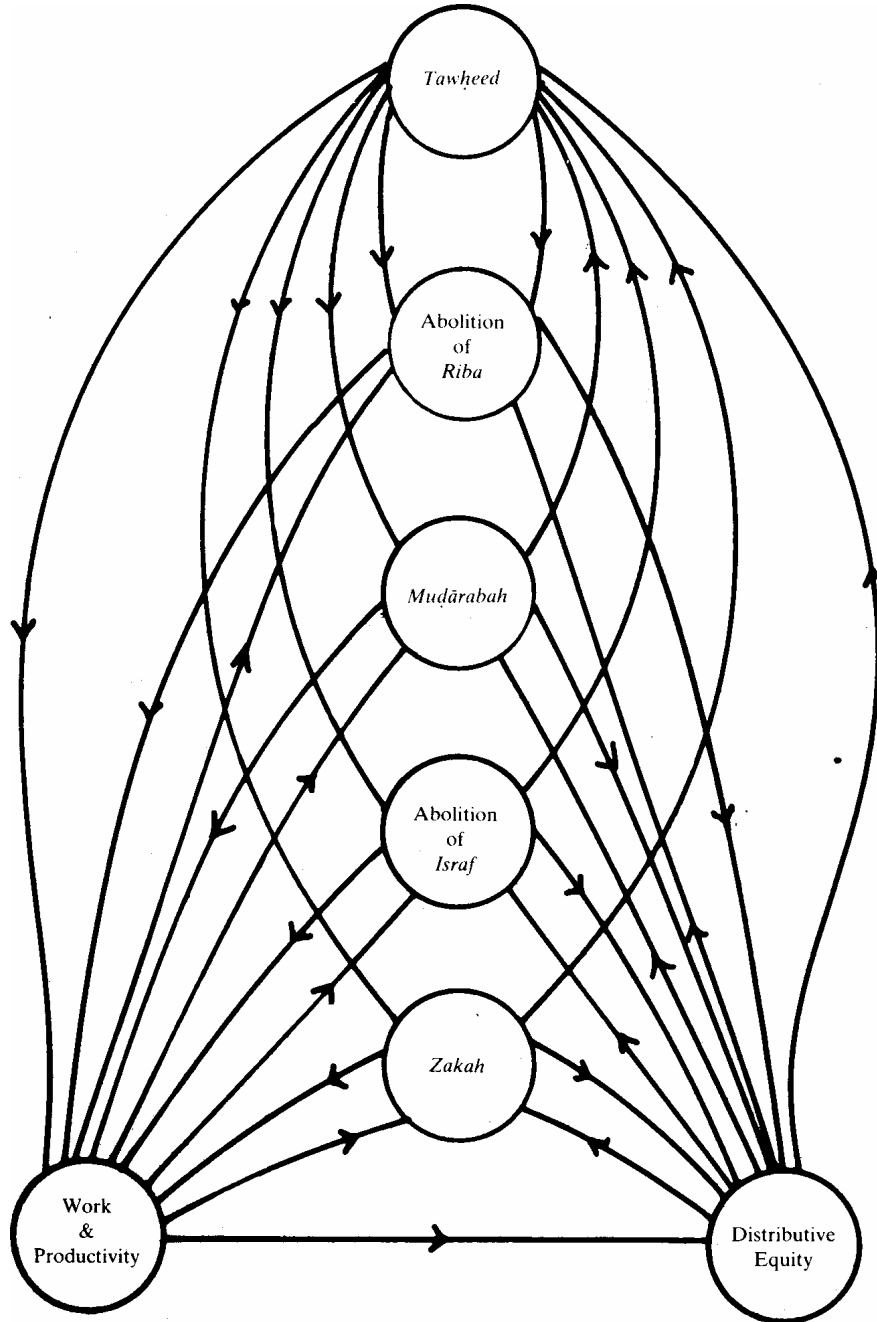


Fig. II.  
Inter-relationships among Principles and  
Policy Instruments in an Islamic Economy



The Principle of Ethical Endogeneity can be derived from the beautiful verse of the Qur'an (Surah XIV: 24): "Do you not see to what Allah has likened the 'Pure Word'? It is like a good tree which has got deep roots into the earth and whose branches have spread high up into heaven. It bears good fruit every moment by the permission of its Lord. Allah cites these parables for the benefit of people so that they learn a lesson from them". Commenting upon this verse, Abul A'la Maududi writes, "As the entire system of the universe hangs upon the Reality contained in this 'Pure Word' which the believer professes, the earth and its entire system co-operates with him and the heaven with its entire system welcomes him. There is, therefore, no conflict between him and the law of nature, and everything in its very nature extends its help to him".<sup>(6)</sup>

### **A Mathematical Formulation of the Principle of Ethical Endogeneity: The Case of Islamic Economic Model**

A mathematical formulation of the Principle of Ethical Endogeneity can now be developed.

Let a decision set in the ethico-economic system be defined by:

$$D = \left\{ (\bar{x}, \bar{y}) : \bar{x} \in \bigcap_a X_a, \bar{y} \in \bigcap_a Y_a \right\} \text{ where}$$

$$\bar{x} = (x_1, x_2, \dots, x_n), \bar{y} = (y_1, y_2, \dots, y_m)$$

'a' denotes the number of decision makers involved in complete consensus formation in the x-state variables and y policy variables (Intrilligator 1971). Thus,  $X_a$  denotes a set of state variables for the ath decision making group,  $Y_a$  denotes a set of decision variables for the ath decision making group.

The decision set as characterized above raises an issue in the relevance of policy in economic theory in general and Islamic economic theory in particular. In Islamic economics there is a debate, for instance, in the area of instantaneous abolition of interest rate from all economic transactions. The question raised is whether the rate of interest (*Riba*) should be abolished in one go or the abolition be phased out over time<sup>(7)</sup> (and Chouhudy 1982). There is a similar debate on whether the mark-up on foreign trade financing practised by Islamic banks and the Islamic Development Bank is a profit or a shadow rate of interest.<sup>(8)</sup> Then there is a debate on whether *Mudarabah* should be based on long term projects only or on short term projects as well. In all these and more, the above formalization of the decision set under consensus formation shows, that at any given situation of an Islamic society moving along its optimal trajectories of state variables and policy variables, these variables must be determined through consensus.<sup>(9)</sup> Subsequent to this, as the Islamic society evolves into higher stages of organization, ethical perfection and greater consensus on wider ranging issues and policy variables, then the set, D, will expand with  $\bigcap_a$  and  $X_a$  and  $\bigcap_a Y_a$  becoming larger. For these to happen we need, a  $\hat{A}$   $A$ ,  $b \in B$ , the sets of decision makers and policies, respectively.

There appears to be no Islamic injunction calling for a one shot establishing of all the pre-conditions of a Golden Islamic Society. That would be an illusory prescription to follow. The essence of Islamic Economic Evolution like that of the Steady State Growth in the literature is to evolve society towards the final desired state along an optimal menu of goals (state variables) and policies (decision variables). In Islamic policy formulation the above formalization implies that while in the development of Islamic economic theory the problem of ethics and economics will be cast in the *Shari'ah* mould, this should be limited initially to the principal aspects of the Islamic law, which can suffice to impart the assumptions and functions of the Islamic economy. This can be done by choosing only those areas where there is overall consensus among the Islamic schools. To go beyond this would be to delimit the uniqueness of assumptions and the internal consistency requirements for the development of a scientific theory of Islamic economics. The Qur'an points out to such a graduated path of evolution of an Islamic society to the Golden Stage (Surah III: 200): "O ye who believe! Persevere in patience and constancy; vie in such perseverance, strengthen each other; and fear God, that ye may prosper.

The social transformation curve attained by the selection of state variables and policy variables under complete consensus is given by:

$$T = T(\bar{x}, \bar{y})$$

It has been shown elsewhere, that the ethical target set,  $\bar{X}$ , and the ethical policy set,  $\bar{Y}$ , are both compact sets (closed and bounded) (Choudhury, Chap 12, 1986). This makes the ethical social welfare function (transformation),  $T(\bar{x}, \bar{y})$  well-defined on the decision set. Now, the Principle of Ethical Endogeneity gives rise to the following mappings (Maddox 1970):

$$\begin{aligned} \phi_1 : \bigcap_b Y_b &\xrightarrow{\text{onto}} \bigcap_a X_a, \text{ i.e., } \phi_1(\bigcap_b Y_b) \subseteq \bigcap_a X_a \\ \phi_2 : (\bigcap_a X_a)^{-1} &\xrightarrow{\text{onto}} \bigcap_b Y_b, \text{ i.e., } \phi_2(\bigcap_a X_a)^{-1} \subseteq \bigcap_b Y_b \end{aligned}$$

Therefore, the Jacobian,  $J(X_a) \neq 0$  to Thus, the differentiability properties of the function,  $\phi_2$  on the set,  $\bigcap_a X_a$  establishes non-zero partial differentials of  $\phi_2$ . However, the mappings being onto,  $\phi_2, \phi_1 \neq 1$  (identity mapping). The significance of the onto mappings is that, the decision set can be augmented by a larger set of state variables and policy variables as society moves up into higher levels of ethical perfection. Besides, there are interactive relations between these two sets along the optimal trajectories towards optimal social welfare.

In light of the interactive relations among the state variables and policy variables, say, of the form,  $Y_i = h_i(X_1, X_2, \dots, X_n)$ ,  $h'_i > 0$ ,  $i = 1, 2, \dots, m$ , the shape of the social welfare transformation,  $T(\bar{x}, \bar{y})$  can now be well-defined. This is established with the help of the following diagrams:

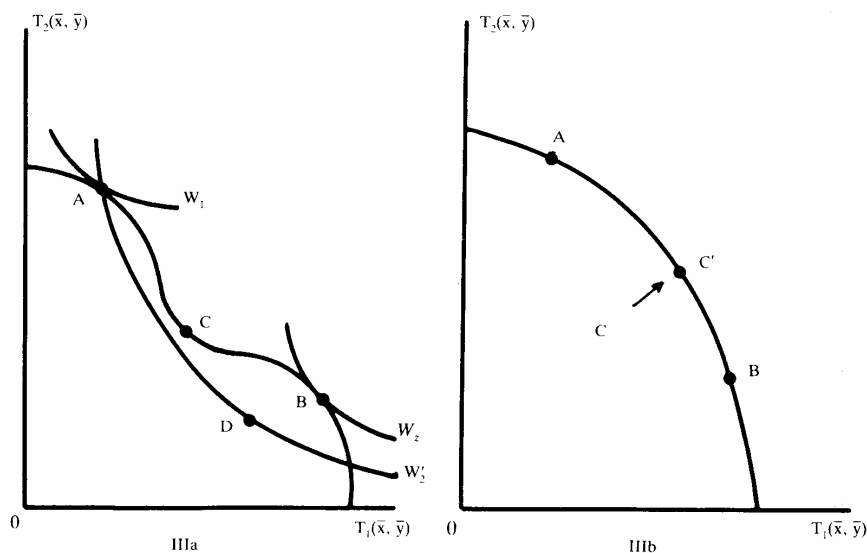


Fig. III. Shape of the Social Welfare Transformation in an Islamic Economy.

Figure IIIa shows that a change in priority or a combination of optimal policies can reach an Islamic society during anyone juncture, to points like A, B, where the social indifference curves,  $W_1$  and  $W_2$  are tangent to the grand social welfare transformation surface. An example of such priorities could be for point A to represent a greater mobilization of resources into real capital formation and less into current consumption, also thereby implying a greater use of *Zakah* resources towards human resource development for the needy and less towards transfer payments. The point B can then start for a program of *Zakah* expenditure in current consumption, as for example, for mitigating poverty through transfer payments.

On the other hand points like C and D are not feasible when we have interactive functions like  $\phi_1, \phi_2$  for if A(B) is the point of social choice then, the state variables and policy being interrelated, any move away from B and towards A must contribute towards higher values of  $T_2(\bar{x}, \bar{y})$ . Points C and D contradict this. Hence, the Islamic social welfare function is finally of the form shown in Figure IIIb. The elimination of a point like C in Figure IIIa also implies that there is no scope for a trade-off between equity and efficiency in such a society-if the point A represents gains in efficiency and the point B gains in equity, then by moving from A to B we do not reduce the total social welfare of society, which potentially is at a point  $C^1$ , not C. The Islamic social transformation surface is shown in Figure IIIb.

### **The Dynamic Formulation of the Model of Ethical Endogeneity: The Case of Islamic Economics**

The dynamic version of the social welfare transformation curve shown in Figure III can now be explained with the help of the methodology developed by Dorfman, Samuelson, and Solow (1958). Points like A, C<sup>1</sup>, B on the social welfare transformation are efficient output points from a more generic transformation surface. The points A, C<sup>1</sup>, B become subsequently efficient input points for higher level efficient output points on a different social welfare transformation surface. The locus of these inputs and outputs describes the efficient trajectory of state variables. They would also describe the efficient trajectory of policy variables, because the state and policy variables are interrelated. According to neo-classical economic methodology on intertemporal efficient resource allocation,

$$\begin{array}{l} \text{MRS (between goods)} \\ \text{regarded as inputs =} \\ \text{of the previous period} \end{array} \qquad \text{MRS (as input for the next period)}$$

In the context of the Islamic social welfare function the above condition would translate to the following one:

$$\frac{\partial T_1(\bar{x}, \bar{y})}{\partial T_2(\bar{x}, \bar{y})} = - \frac{\partial T_1(\bar{x}, \bar{y}) / \partial \bar{x}}{\partial T_2(\bar{x}, \bar{y}) / \partial \bar{x}}, \text{ given } \bar{y} = h(\bar{x}).$$

Here, the left hand side of the expression gives the MRS<sub>T<sub>1</sub>, T<sub>2</sub></sub> in terms of choices of points like, A and B. The right hand side of the expression gives the ratios of marginal social benefits in the case of the two social welfare levels, T<sub>1</sub> and T<sub>2</sub>.

Figure III now shows up as follows:

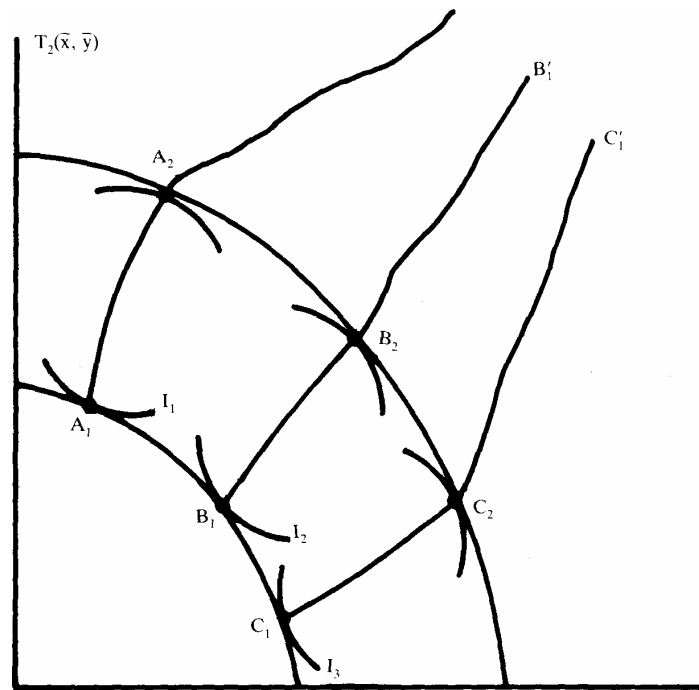


Fig. IV. Condition for Optimal Trajectory of State Variables in the Islamic Economy

In the diagram, the slopes of points like  $A_1$ ,  $B_1$ ,  $C_1$  ( $A_2$ ,  $B_2$ ,  $C_2$  etc.) give the respective  $MRS_{T_1, T_2}$ . The same slopes at these points tangent to  $I_1$ ,  $I_2$ ,  $I_3$  give the ratios of the marginal social benefits of  $T_1$ ,  $T_2$ .

In the above formalization, the state variables and the policy variables appear as quantifiable socio-economic variables and ethical imponderables. In both cases, values attached to these to describe the trajectories may appear as ordinal weights placed on these by decision makers. In the Islamic social order the decision making process assumes a democratic and decentralised form *Shura* and the weights are developed in reference to Islamic law *Shari'ah*. These same weights are iterated in the ethical endogeneity system from one point to another as shown in Figure 1.

In light of the above formalization, the dynamic version of constrained social welfare maximization problem is now formulated as follows (Intrilligator 1971). The variables and functions appear in vectorial notation.

$$\begin{aligned} & \text{Max} \int_{t_0}^{t_1} T(\bar{x}, \bar{y}, A) \bar{e}^{\bar{p}t} dT \\ & \text{Subject to }^{(*)}, \quad \bar{e} = \rho \bar{x}, \text{ or } \dot{\bar{c}} = \bar{p} \dot{\bar{x}} \\ & \bar{y} = \bar{h}(\bar{x}), \text{ or } \bar{y} = \frac{\partial \bar{h}(\bar{x})}{\partial \bar{x}} \cdot \dot{\bar{x}} \\ & \bar{x}(t_0) = x_0, \bar{y}(t_0) = y_0 \end{aligned}$$

The Lagrangian for this optimization problem is:

$$L = T(\bar{x}, \bar{y}, t) \bar{e}^{\bar{p}t} + \lambda_1 (\dot{\bar{c}} - \bar{p} \dot{\bar{x}}) \lambda_2 \left( \dot{\bar{y}} - \frac{\partial \bar{h}(\bar{x})}{\partial \bar{x}} \dot{\bar{x}} \right), \lambda_1, \lambda_2 \neq 0$$

Maximizing L with respect to  $(\bar{x}, \bar{y})$  yields the following relations:

$$\begin{aligned} \frac{\partial L}{\partial \bar{x}} &= \frac{\partial T}{\partial \bar{x}} \bar{e}^{\bar{p}t} + \lambda_1 \left( \frac{\partial \dot{\bar{c}}}{\partial \bar{x}} - \bar{p} \frac{\partial \dot{\bar{x}}}{\partial \bar{x}} \right) \\ &+ \lambda_2 \left( \frac{\partial \dot{\bar{y}}}{\partial \bar{x}} - \frac{\partial^2 \bar{h}(\bar{x})}{\partial \bar{x}^2} \dot{\bar{x}} - \frac{\partial \bar{h}(\bar{x})}{\partial \bar{x}} \cdot \frac{\partial \dot{\bar{x}}}{\partial \bar{x}} \right) = C \\ \frac{\partial L}{\partial \bar{y}} &= \frac{\partial T}{\partial \bar{y}} \bar{e}^{\bar{p}t} + \lambda_1 \left( \frac{\partial \dot{\bar{c}}}{\partial \bar{y}} - \bar{p} \frac{\partial \dot{\bar{x}}}{\partial \bar{y}} \right) + \lambda_2 \frac{\partial \dot{\bar{y}}}{\partial \bar{y}} = 0 \end{aligned}$$

Along with the initial conditions these constitute 2 (n + m) equations in 2 (n + m) unknowns,  $\lambda'_x$ . The system is therefore, determinate and an optimal trajectory in state variables and policy variables can be determined.

The result establishes the globally invariant structure of social welfare transformation in the ethico-economic order with complete consensus and ethical endogeneity, shown by inter-relationship among state variables and policy variables. In the Islamic economic order the globally invariant property of the grand social welfare surface shown in Figure IIIb is preserved. However, priorities on state variables and policy variables could change over time. We then have the following forms of social welfare transformation surfaces:

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(\*) Take  $\bar{c} = c(\bar{x}, \bar{y}, t) = \bar{C}(\bar{x}, \bar{h}(\bar{x}), t)$   
 $= \bar{C}(\bar{x}, t)$ , as the cost function

Therefore,  $\dot{\bar{c}} = \frac{\partial \bar{c}}{\partial \bar{x}} \dot{\bar{x}}$ . Because  $\bar{p} = \frac{\partial \bar{c}}{\partial \bar{x}}$  is the marginal social cost, it must be interpreted as a price (or discount) variable.

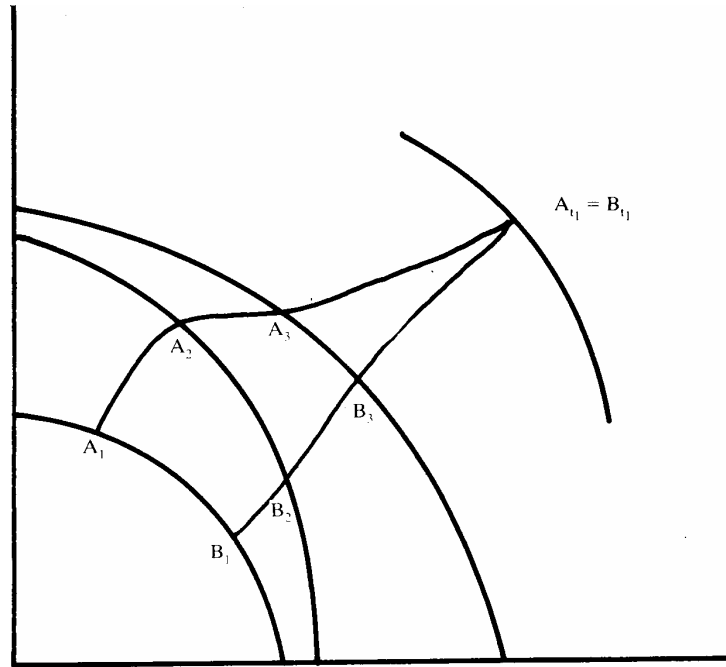


Fig. V. Dynamic version of the Islamic Social Welfare Transformation

The point  $A_{t1} = B_{t1}$ , at the terminal point shows the consistency among various state and policy variables in the Islamic economy towards maximizing the dynamic version of the grand social welfare transformation. The paths  $A_1A_2A_3, \dots, A_{t1}$  and  $B_1B_2B_3, \dots, B_{t1}$  must be the optimal trajectories for the state and policy variables in the two cases of given goals and priorities.

### Conclusion

In this paper we have established a unique foundation of ethico-economic theory termed as Humanomics with Islamic economics being a strong example of such an ethico-economic theory. We have proceeded by establishing what we termed as the Principle of Ethical Endogeneity, in terms of its underlying assumptions, issues and models. These brought out the Principle of Ethical Endogeneity as an optimal control problem, in which society is shown to maximize its grand social welfare transformation through the media of complete consensus among decision makers in a democratic and decentralized system, with the choice of state variables (targets, goals) and policy variables. The optimal trajectory for social welfare maximization is shown to be described by interrelated state and policy variables. In the Islamic economy such variables are uniquely set by the precepts of Qur'an, Sunnah and Shari'ah. The analytical study presented in this paper discovers these Islamic goals, policies and their inter-relationships in the context of the models of Ethical Endogeneity.

## Technical Appendix

The problem solved in the dynamic version of constrained social welfare maximization with state and policy variables can be resolved by addressing to a combination of the optimal control problem and the calculus of variation. Much of this appendix uses the methodology developed by Intrilligator.

The general form of the objective functional to be maximized is,

$$\text{Max}_{(y(t))} \int_{t_0}^{t_1} I(x, y, t) dt + F(x_1, y_1, t_1)$$

where, the vector  $x(t)$  denotes the time-dependent state (target) variables and the vector  $y(t)$  denotes the time-dependent policy variables.  $F(x_1, t_1)$  is the terminal state functional at finite terminal time.

The constraints of the objective functional is given by,

$$\begin{aligned} \dot{x} &= f(x, y, t) \\ x(t_0) &= x_0, x(t_1) = x_1 \end{aligned}$$

In our problem, these constraints appear as,

$$\begin{aligned} \dot{x} &= \dot{c}/p \\ \dot{y} &= \frac{\partial h(x)}{\partial x} \cdot \dot{x} \\ x(t_0) &= x_0, \\ x(t_1) &= x_1 \end{aligned}$$

Now, when the constraints are introduced into the objective functional, we obtain the integrand in the form of a Lagrangian functional in  $x$  and  $y$ :

$$\begin{aligned} I(x, y, t) &\rightarrow T(x, y, t)e^{-pt} + \lambda_1 \left( \dot{x} - \frac{\dot{c}}{p} \right) + \lambda_2 \left( \dot{y} - \frac{\partial h}{\partial x} \cdot \dot{x} \right) \\ \text{or, } \text{Max}_{(x(t), y(t))} \int_{t_0}^{t_1} & [T(x, y, t)e^{-pt} + \lambda_1 \left( \dot{x} - \frac{\dot{c}}{p} \right) + \lambda_2 \left( \dot{y} - \frac{\partial h}{\partial x} \cdot \dot{x} \right)] dt + F(x_1, y_1, t_1) \end{aligned}$$

Due to the monotonicity between  $x$  and  $y$  in the relations,

$$y = h(x),$$

$\frac{\partial y}{\partial x} > 0$ . for all  $x$  and  $y$ , in vectorial notation, the Lagrangian type integrand is also



monotonic (increasing or decreasing together) Hence, maximization of the objective functional in the optimal control problem is equivalent to the optimization of the Lagrangian integrand. This yields the calculus of variation problem in maximizing this integrand. The condition for this maximality is given by Euler equations,

$$\frac{\partial I'}{\partial x} - \frac{d}{dt} \left( \frac{\partial I'}{\partial \dot{x}} \right) = 0, \quad \frac{\partial I'}{\partial y} - \frac{d}{dt} \left( \frac{\partial I'}{\partial \dot{y}} \right) = 0$$

where  $I'(x, \dot{x}, y, \dot{y}, t) = T(x, y, t) e^{-\rho t} + \lambda_1 \left( \dot{x} - \frac{\dot{c}}{p} \right) + \lambda_2 \left( \dot{y} - \frac{\partial h}{\partial x} - \dot{x} \right) I'$  can be rewritten as,  $I'(z, \dot{z}, t)$ , where  $z = (x, y)$   $\dot{z} = (\dot{x}, \dot{y})$ . The above conditions together with the boundary conditions characterizes the optimal solution.

Since,  $\frac{\partial h}{\partial x}$  can be treated as a market response to policy, it is fair to assume this response to be a constant in a social welfare maximization problem. With all these simplifications,

$$\frac{d}{dt} \left( \frac{\partial I'}{\partial \dot{x}} \right) = 0, \quad \frac{d}{dt} \left( \frac{\partial I'}{\partial \dot{y}} \right) = 0$$

We are now left with,  $\frac{\partial I'}{\partial x} = 0, \frac{\partial I'}{\partial y} = 0$ .

This is the same as a dynamic version of the Lagrangian optimization problem summarized in the text of this paper. These optimal conditions together with the boundary conditions characterize the optimal solution of the original constrained optimization problem. The resulting equations are given in the text of the paper.

### Notes

1. The idea of social good is developed by the author in his paper, "A Model of Educational Planning and Development in Islamic Perspectives", *Muslim Education Quarterly*, Vol. 1, No. 1, 1983.
2. The following section is summarized from the author's Editorial to *Humanomics* (International Academic Journal).
3. See issues of the International Academic Journal, *Humanomics* (Centre of Humanomics, Department of Social Sciences, University College of Cape Breton, Nova Scotia, Canada). This definition of Humanomics is derived from the author's *The Paradigm of Humanomics* (forthcoming), Faculty of Economics, University of Kebangsaan Malaysia Press.
4. The transitivity condition on social states is reestablished in Islamic economics once ethical variables have conditioned the consumption, production and distributional variables. See, M.A. Choudhury, "The Rate of Capitalization in Valuation Models in an Islamic Economy", *Fiscal Policy and Resource Allocation in Islam* (eds.) Z. Ahmed et al. (International Centre for Research in Islamic Economics, Jeddah, Saudi Arabia and the Institute of Policy Studies, Islamabad, Pakistan, 1983).

5. This Dome of Islamic Socio-Economic Relationships was first introduced by the author at the Faculty of Economics Seminar, University Kebangsaan, Malaysia, July 1986. It is also detailed in the author's paper "The Blending of Religious and Social Orders in Islam", forthcoming, *International Review of Ethics and Economics*.
6. **A.A. Maududi**, *The Meaning of the Qur'an*. Vol. **IV**. Surah Ibrahim.
7. **S.N.H. Naqvi**, "Interest Rate and Intertemporal Allocative Efficiency in an Islamic Economy". (mimeo) International Centre for Research in Islamic Economics. Jeddah, Saudi Arabia.
8. **M.A. Choudhury**, "Some Critical Issues in Foreign Trade Financing of Capital Goods Among Islamic Countries", (mimeo) Department of Social Sciences, University College of Cape Breton, Nova Scotia. Canada.  
This definition of Humanomics is derived from the author's *The Paradigm of Humoconomics* (forthcoming), Faculty of Economics, University of Kehangsaan Malaysia Press).
9. Another mathematical formulation of this problem appears in the author's conference paper, "Decision Making Under Consensus: The Case of Economic Cooperation", International Conference on Mathematical Economics and its Relevance for Development, University of Chittagong. Bangladesh. December 1986.

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## البنية الاقتصادية – الإنسانية لنظرية الاقتصاد الإسلامي

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**المستخلص :** يستعرض البحث المحاولات السابقة لصياغة اقتصاد سياسي إنساني، ثم يرسى مبدأ "الأخلاقية الذاتية" (الراسخة في الذات) ويبين أن المجتمع يبلغ بمصلحته حدها الأقصى من خلال إجماع متخذي القرار على اختيار الأهداف ومتغيرات السياسة الاقتصادية.

وتحدد الشريعة الإسلامية تلك الأهداف والسياسات بصورة واضحة. ويتميز الاقتصاد الإسلامي بمبدأ التوحيد والأخوة، والعمل والإنتاج وعدالة التوزيع، ويحقق أهدافه بالزكاة، وإلغاء الفائدة، وتطبيق المشاركة في الأرباح .