Micro-money, finance and real economy interrelationship in the framework of Islamic ontology of unity of knowledge and the world-system of social economy

Masudul Alam Choudhury

Department of Shari'ah and Economics,
University of Malaya, Kuala Lumpur, Malaysia and
Postgraduate Program in Islamic Economics and Finance,
Universitas Trisakti, Jakarta, Indonesia

Abstract

Purpose – The purpose of this paper is to explain the structure of Islamic monetary transformation into 100 percent reserve requirement monetary system in terms of the foundational epistemology of the unity of divine knowledge (tawhid). This approach is a scholarly originality in the field of epistemological formalism concerning Islamic theory and perspectives in economic reasoning in comparative perspectives.

Design/methodology/approach – The role of micro-money pursuing projects and real economic exchange relations is shown to arise by a natural causality in the ethical social economy (SE). This results in a microeconomic perspective of the quantity theory of money with ethical and social implications. A comparative study of endogenous money in the quantity theory of money points out significant differences between the theory of endogenous money in Islam and mainstream methodologies. A formal model of micro-money and its organismic endogenous relationship with the real economy is formulated with the goal of realizing social well-being, economic stabilization, and sustainability of development regimes.

Findings – This is a conceptual paper, though with the potential for continued work in applying the theory of micro-money in the Islamic methodological perspective of unity of knowledge. This is an original contribution of this paper. Islamic economists have not been able to produce a rigorous theory of micro-money. They have also not been able to situate the study of Islamic economics with its specific contribution to the field of the nature of money in project-specific financing of Islamic projects by the money-finance-real economy inter-causal relations. Thus, the findings of this paper, though of the conceptual nature, open doors to a vast field of methodological development and its application to the problem of micro-money modeling. Such a conceptual finding arising from the methodological theory of unity of knowledge and applied to the topic of micro-money along with some examples of potentiality of these approaches constitutes a vastly original field of findings as contribution. Thereby, an analytical model is established in the Islamic social economy (ISE) perspective. The model is used to explain monetary transmission and functioning of monetary policy with instruments that avoid interest rate and comply with Islamic financing requirements. The resulting model of money, finance, and real economy (MFE) systemic interrelationship in reference to the epistemology of unity of knowledge leads into the construction of a 100 percent reserve requirement monetary system with the gold-backed micro-money as currency complementing real economic transactions.

Research limitations/implications – The present paper is of a conceptual type based on the essential ontological and epistemological foundation of Islamic social and economic thought and bearing a deeply scientific implication. The conceptual part of this paper becomes a study in the foundations. The second part follows into the study of application in the real world of micro-money in terms of financing projects. Micro-money pursues projects in the Islamic economy due to its very nature of ethical and social choices. The paper shows that such a micro-money transmission is realized by the money-finance-real economy integrated model. Thereby, some real-world examples of such transformations are given. All these together substantiate the conceptual-analytical-empirical nature of the study conducted.

Practical implications – The development of the micro-money transmission system of generalized circular causation interrelations between MFE activities as a return to 100 percent reserve requirement monetary system with the gold standard is the profound theory that has been propounded. Its applied perspectives are implied through the MFE-model wherein micro-money pursues social projects. Furthermore, the possibility

and practicality of such a conceptual model of micro-money and its transmission mechanism in the real economy are established by real-world examples of kinds of micro-money that are found to circulate or are recommended by some studies in the literature.

Social implications – The conceptual part of the paper presents a model of generalized epistemological model of unity of knowledge characterizing the MFE circular causal interrelations as the organismic meaning of social ethics and evolutionary learning. The social implications are the epistemic foundations of the derived model in the midst of choices of life-fulfillment projects that micro-money finances and the economy sustain.

Originality/value – This is an original paper premised on the general and the specific Islamic epistemological criterion of unity of knowledge as a generalized system theory. It is now particularized to the case of money and real economy by using the Islamic perspective of creating conditions to regenerate resources continuously in SE with ethical implications. The paper is equally informative to all who like to understand the social and ethical nature of endogenous relations between money and the real economy as two great institutions of the national economy. These together bestow well-being to the society at large in the construction of SE. Specific attention in this regard is given to ISE.

Keywords 100 per cent reserve requirement, Global monetary integration, Islamic epistemic theory of money, Microeconomics of quantity theory of money in Islam, Monetary theory, Money and real economy

Paper type Research paper

Introduction

Almost in all of economic theories, money has been treated as an aggregate macroeconomic unit of valuation of exchange of goods and services also treated as macroeconomic entities. Seldom, and only within the Austrian monetary tradition (Yeager, 1983; Yaeger, 1997) and a certain feature of the quantity theory of money in terms of the equation of exchange Friedman (1989) has it been realized that the nearly exact value and quantity of money can be obtained in terms of the micro-units of money that fits into the valuation of projects. The issue at point is that money in its correct quantity and valuation ought to pursue the exchange value of goods and services, presently and intertemporally. Such market exchange takes place in terms of projects. Therefore, to be exact in the monetary exchange context of valuation, the quantity and valuation of money ought to equate the valuation of projects. Such projects can be of real goods and services, and financial assets. The extended valuation concept involves intertemporality.

Furthermore, in the context of Islamic concept of market valuation and the use of money in real activities that fetch their values in the midst of market exchange, it is important to note how money, finance, and real goods and services interrelate to establish such exactness of valuation (von Mises, 1976). It is such an organically interrelated worldview between diversities of organisms that principally yields the meaning of unity of knowledge in the Islamic context. Such a foundational ontology of unity of knowledge that money, finance, and real economic (MFE) entities display as a particular case is taken from the midst of the general and specific theories of the monetary phenomenon in the context of markets that the organic relational meaning of morality and ethics arises. These values thereby characterize the ethicizing nature of goods, services, market exchange, and the nature of their exchange relationship in the midst of the monetary and financial flows, interconnecting all these entities in the sense of exactness of valuation of projects. The emanating circular causation interrelationship is particularly caused by the deconstruction of monetary flows equating their valuation in market exchange. The micro-project nature of money, finance, and real exchange enters the field of academic investigation as a novelty. Yet furthermore, such intertemporal valuations are carried out by the principle of "nearest" match between the quantity and value of money and the intertemporal existence of market events of exchange. We thereby characterize intertemporality of events as the moving magnum of probabilistic knowledge, and probabilistic occurrence of exchange events over time.

In the context of the above explanation of the relational organic idea of morality, ethics, and the monetary function relating to finance and real goods and services in market

exchange, the totality of the events as mentioned above forms the social economy (SE). We therefore define the SE and the specific case of Islamic monetary relations in SE as the topological relationship of the probabilistic universe at all points of time: we define the Islamic social economy, ISE(θ) = {SE(θ, $\mathbf{x}(\theta)$, $t(\theta)$}. ISE yields an objective criterion of organic interrelationship in the unity of knowledge. The objective criterion is symbolized by W(ISE(θ)) with $dW/d\theta > 0$. The symbols in the particular case of the circular inter-causal relationships between money $M_i(\theta)$, finance $F_i(\theta)$, and real economy $E_i(\theta)$ variables are explained as follows:

$$W(\theta) = W(M_i, F_i, t)[\theta]; dW/d\theta = S\big[\partial W/\partial x(\theta)\big].\big(dx(\theta)/d\theta\big) > 0 \text{ identically} \qquad (1)$$

where $W(\theta)$ denotes the criterion of ethicality as represented by circular causation relations between the inter-causal variables for the i-projects (denoted by "i"):

$$\mathbf{x_i}(\theta) = \big\{M_i(F_i, E_i, t)[\theta], F_i, (M_i, E_i, t)[\theta], E(M_i, F_i, t)[\theta]\big\} \qquad (2)$$

where "i" indexed with the variables represents projects according to the broad definition of project given above. The grouping together of i-projects will be denoted by "pr." At times, we will drop the suffix "i" and carry on to denote projects all the same.

The function of $\{\theta\}$ as a knowledge variable is based on the probabilistic nature of events. This conveys the meaning of incompleteness and evolutionary learning over points of time with the property of "nearest" exact evaluation of events (Choudhury, 2012). Furthermore, the "nearest" exact evaluation in the probabilistic sense with the ontological foundation of unity of knowledge in the ISE-sense establishes the primal condition, $\{\theta\} \in (\Omega, S)$. Ω denotes the foundational ontology of unity of knowledge; S denotes the primal mapping that derives $\{\theta\}$ from Ω. Hence, (Ω, S) forms the primal ontological tuple of knowledge derivation in ISE. And in the probabilistic sense, $\{\theta\}$ is continuous learning in respect of (Ω, S).

The microeconomic nature of the knowledge variable, $\{\theta\}$ and θ-induced $\{\mathbf{x_i}(\theta)\}$ vector implies that these cannot be aggregated to any sense of macroeconomic variables. Thereby, the macroeconomic version of the quantity theory of money, as known, cannot be applied to any acceptable concept of aggregating the micro-money. The theory of monetary aggregates of macroeconomics and its economic consequences is thereby not conformable with the micro-monetary concept and its implications in the theory of monetary transmission. So, when micro-money is aggregated in the microeconomic sense, and based on relational criterion of unity of knowledge derived from the foundational ontology of ISE, we then do not treat this aggregate as any macroeconomic money variable. Likewise, the $\{\mathbf{x}(\theta)\}$-vector of the stated variables in the micro-money system of aggregate equations in MFE variables at every point of time do not bear a macroeconomic meaning.

Objective
The original concept of micro-money presented in this paper in terms of its organically interrelated projects as explained above in terms of the ontological reference to unity of knowledge brings forth the theoretical issue to be discussed at an analytical level. This leads us to formalize a model of micro-money with its circular causation relations in the ethical objective criterion, $W(\theta)$. We will formalize such a model of MFE circular causation model over time. This model will be studied next in respect of the micro-money implication of the monetary transmission. The intertemporal nature of valuation of events relating to circular causation of interrelationships between MFE will be studied in respect of the problem of monetary transmission, given the two states of unity of knowledge as

the epistemic basis of abstraction, and the transmission mechanism in terms of the formalized circular causation model of micro-money. Applications of micro-money theory will be shown in respect of the resulting possible emergence of 100 percent reserve requirements monetary system with a subtle re-conceptualization. The appropriate review of the literature is duly addressed.

Model formalism regarding circular causal relations between micro-money and MFE

ISE takes its birth on the primal ontological premise of monotheistic unity of knowledge as a universal law (Choudhury and Rahim, 2016). This emergence defines the unifying, i.e. participative and universally complementary circular causation relations revolving around the attainment of the well-being criterion as the conceptual and quantitative measure of the objective ontological unity of being and becoming. This attribute presents a dynamic process of interaction, integration, and evolutionary learning between the good things of life as life-fulfillment needs. This ontological premise is foundational in theoretical and applied contexts of ISE.

Without this originary nature of its distinctiveness, ISE is unable, as a scientific endeavor, to answer the following questions: what are the foundational axioms upon which a consistent and authentic methodological worldview can be erected? How does such a methodological worldview apply to the universal and particular generalized system that characterizes various fields of socio-scientific enquiry? These questions remain unanswered, as in present days' clamor of Islamic economics, the latter still remains a new born field copying mainstream economic criticism (Mahomedy, 2013).

Thereby, a socio-scientific model of ethicality and well-being in the light of the ontology of unity of knowledge as the primal feature of Islamic economics and finance remains unexplained and unformed to date. In the model of circular causal relationship between money, finance, and the real economy (MFE(θ)), the circular causation expression of the $\mathbf{x}(\theta)$-vector is unknown as an abstracto-empirical analytical system explaining pervasive unity of knowledge between the moral and ethical choices. These are the choices of moral and ethical sustainability along the life-fulfillment regimes of development (Shatibi, n.d.; Rawls, 1971; Streeten, 1981).

The strongly endogenous nature of circular causation relations between the x(θ)-vector as in expression (2) (Desai, 1989) breaks down with the inability of Islamic economics to formalize a micro-project oriented theory of micro-money, while leaving money in its mainstream macroeconomic nature. In other words, Islamic economics as it presently stands imitates the quantity theory of money by the equation of exchange. There is no possibility of its deconstruction into projects by market-driven exchange version of micro-money. The aggregation of micro-money into macroeconomic conception of the monetary aggregate remains theoretically absurd.

Aggregate micro-money valuation|Macro-exchange equation:

$$\sum_i M_i(\theta_i).v_i(\theta_i) = \sum_i (T_i p_i)[\theta_i] \neq M.v = T.p, \tag{3}$$

the macroeconomic version of equation of exchange. $v_i(\theta_i)$ denotes $\{\theta_i\}$-induced velocity of money circulation across i-projects. T_i denotes $\{\theta_i\}$-induced transactions in i-projects. $p_i(\theta_i)$ denotes $\{\theta_i\}$-induced prices of i-projects accounting for transactions, T_i.

T denotes the macroeconomic aggregate number of transactions. $T_i(\theta)$ denotes the project-specific number of transactions, such as, number of bread sold or distributed through Hunger-Alleviating Project induced by θ_i-social consciousness to yield affordable stable price-value induced by θ, namely, $p_i(\theta)$. T_i furthermore contains the variables, $(F_i, E_i)[\theta_i]$. $\{v_i(\theta_i)\}$

is the project-specific velocity of money circulation, yet different from the macro-monetary aggregate version of the velocity of money circulation denoted by v.

With $\Sigma_i(T_i p_i)[\theta_i]$ denoting value added of all micro-project transactions, expression (3) valuational macro-exchange equation:

$$\left[\sum_i M_i(\theta_i).v_i(\theta_i)\right] / \left[\sum_i v_i(\theta_i)\right] \cdot \left[\sum_i v_i(\theta_i)\right] = \sum_i (T_i p_i)[\theta_i] = (M_{pr}.v_{pr})\left[\theta_{pr}\right] = (T.p)\left[\theta_{pr}\right],$$

(4)

which is taken across all project-specific groups ("pr") of value-added in relation to the quantity of money. Notwithstanding the project group-specific micro-money weighted average is not equal to the macro-money version of the equation of exchange, $M.v = T.p$.
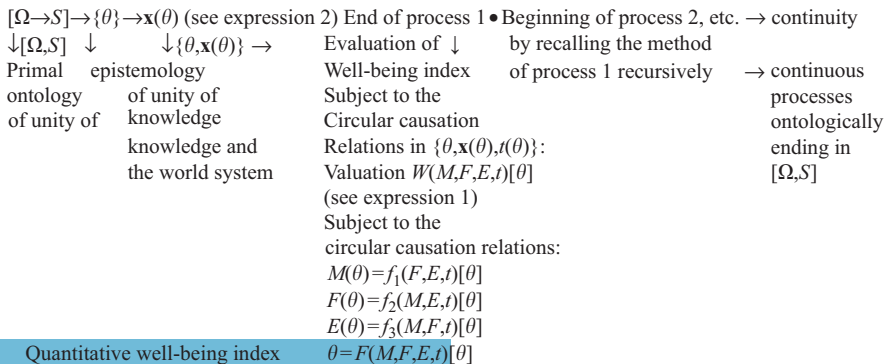
Equation (4) can be re-written in the weighted average form:

$$(M_{pr}.v_{pr})\left[\theta_{pr}\right] = [(T.p)]\left[\theta_{pr}\right].$$

(5)

This version of the micro-money equation of exchange points out the following inferences: the quantity of money equals the value of spending. This correspondence of valuation becomes exact when $v_{pr}(\theta_{pr}) = 1$, meaning full mobilization of quantities of money in i-projects. That is the valuation of money exactly equals the value of spending measured in terms of the i-projects value-added $(T.p)[\theta_{pr}]$. However, a fractional value of the velocity of money circulation denoted by $v_{pr}(\theta_{pr})$ is acceptable and instructive, indicating a probability margin to exactness. Thereby, in this situation, there is a scope for interactive, integrative, and evolutionary (IIE) learning in and between the $\mathbf{x}_i(\theta)$-vector of variables in expression (1), and in respect of institutional discourse to increase the velocity of money circulation toward advancing the choices of the life-fulfillment regimes of reconstruction of ISE.

The formal model of micro-money by combining expressions (1)-(5)

The following steps lead toward the construction of the formal model of micro-money, finance, and the real economy (MFE(θ) formal model) in the framework of Islamic ontological foundation of monotheistic unity of knowledge and its consilience with the world-system. This is specified here by the system of interaction, integration, and evolutionary learning (IIE) model interconnecting MFE (Choudhury, 2015). Figure 1 outlines this model construction with its attributes.

$[\Omega \rightarrow S] \rightarrow \{\theta\} \rightarrow \mathbf{x}(\theta)$ (see expression 2) End of process 1 • Beginning of process 2, etc. $\rightarrow$ continuity
$\downarrow[\Omega,S] \quad \downarrow \quad \downarrow\{\theta,\mathbf{x}(\theta)\} \rightarrow$ Evaluation of $\downarrow$ by recalling the method
Primal   epistemology   Well-being index   of process 1 recursively $\rightarrow$ continuous
ontology   of unity of   Subject to the   processes
of unity of   knowledge   Circular causation   ontologically
knowledge and   Relations in $\{\theta,\mathbf{x}(\theta),t(\theta)\}$:   ending in
the world system   Valuation $W(M,F,E,t)[\theta]$ $[\Omega,S]$
                            (see expression 1)
                            Subject to the
                            circular causation relations:
                            $M(\theta) = f_1(F,E,t)[\theta]$
                            $F(\theta) = f_2(M,E,t)[\theta]$
                            $E(\theta) = f_3(M,F,t)[\theta]$
Quantitative well-being index $\theta = F(M,F,E,t)[\theta]$

Figure 1.
The generalized monotheistic ontological model construction in unity of knowledge particularized to micro-money, finance, and real economy (MFE) inter-causality

In the generalized model of ISE particularized to micro-money, finance, and real economy (MFE(θ)) taken intertemporally, the following attributes are noted:

(1) Primal ontological law of unity of knowledge, $[\Omega,S] \rightarrow$ epistemology, $\{\theta\} \rightarrow$ yielding functional ontology, $\{\theta, \mathbf{x}(\theta), t(\theta)\} \rightarrow$ yielding recursively continuous processes of the same type at every moment of time.

(2) The process-oriented continuity implies interaction in deriving $\{\theta\} \in [\Omega,S]$, the mathematical open and unbounded topological domain.

(3) The attribute of integration is explained by simulacra of probability limits denoted by $\text{plim}\{\theta\} = \theta^* \in [\Omega,S]$ with discourse. Hence, convergence remains incomplete in simulacra. Only evolutionary learning abides. Likewise, $\text{plim}\{\mathbf{x}(\theta)\} = x^*(\theta^*) \in [\Omega,S]$ in terms of the defining primal ontological law[1].

(4) The ontological derivation of unity of knowledge and its embedding in the details of the generality and particulars of the world-system by a continuity of epistemological derivation and construction of functional ontologies (Maxwell, 1962; Gruber, 1993) goes through evolutionary learning sequences of a systemic unification over (knowledge, space, time) dimensions.

This contains series of interaction and integration. They are depicted by the following properties:

$$\text{Interaction } (\cup) : \cup_{\text{interaction}} \left\{ \left(\mathbf{x}_{\text{pr}}\left(\theta_{\text{pr}}\right)\right)\right\} \tag{6}$$

leads to:

$$\text{Integration } (\cap) : \cap_{\text{integration}} \cup_{\text{interaction}} \left\{ \left(\mathbf{x}_{\text{pr}}\left(\theta_{\text{pr}}\right)\right)\right\} \tag{7}$$

The above expression holds in relation to all possible monotonic positive transformations of these expressions, as by market-driven conscious choices of goods and services both of financial and real kinds and by institutional and participatory decision making. Such monotonic positive transformations are denoted by $\delta(\cap_{\text{integration}} \cup_{\text{interaction}} \{(\mathbf{x}_{\text{pr}}(\theta_{\text{pr}}))\})$ by way of complementarities in decision making between agents and agencies. Examples of these kinds are individuals, communities, institutions, and private and public sectors interrelations.

A special form of the generalized function of unity of knowledge (e.g. $\delta(\ldots)$) is shown in Figure 1 as the simulation of the well-being function, subject to circular causation relations. This form of the objective well-being criterion differentiated from the gamut of terminologies like utility, welfare, production function, growth model, and their genre is the functional ontology of explaining the primal ontology of monotheistic unity of knowledge in action. The socio-scientific implications of continuity and order of evolutionary equilibriums (Krugman, 1996), as of money, finance, and real economy functioning in simultaneity, form extensions over space and time. The resulting dynamics are now brought out in the evolutionary context of a temporal and intertemporal systemic extensions.

Interaction leading to integration leads to evolutionary learning in continuous processes. This is conveyed by an expression. Consider the following deduction:

$$\begin{array}{ccccccc} & 1 & & 2 & & 3 & & 4 \\ & >0 & >0 & & >0 & >0 & & >0 & >0 & ? & 0 \end{array}$$
$$dW(M,F.E,t)[\theta]/d\theta = (\partial W/\partial M).(dM/d\theta) + (\partial W/\partial F).(dF/d\theta) + (\partial W/\partial E).(dE/d\theta) + (\partial W/\partial t).(dt/d\theta) > 0 \tag{8}$$

Expression (8) is identically positive, for terms 1-3 and wholly and continuously over periods of time, $t[\theta]$. Expression (8) has its meaning in the various interrelations between the terms. We examine these relationships now in the light of the circular causation relations as formulated in Figure 1 for ISE.

Term 1 of expression (8) conveys the following meaning: in ISE, micro-money flows into and between projects (*i*) taken individually and aggregated thereby or in groups of microeconomic projects and social microenterprises ("pr"). Such projects fit into socially productive outlets of the use of money, thereby increasing well-being. An example here is of participative enterprises interactively integrating the corporations with microenterprises, and evolving into more of the same therefrom. Likewise, there are public sector and private sector complementarities in decision making directed to holism of the social, moral, and productive types of enterprises as projects (United Nations Development Program, 1997-2000). Such dynamics were shown in Figure 1 to show their well-being perspectives.

Thus, in all, the positive contribution of money to well-being in ISE shown by ($\partial W/\partial M$) in term 1 of expression (8) is carried by each positive Unitarian effect of relational organic unity of evolutionary learning on the proper utilization of money regarding the good things of life. The compounded contribution of micro-money as "good money" (Hayek, 1999) to total well-being is thus represented by term 1 of expression (8) [($\partial W/\partial M$).($dM/d\theta$) > 0, identically].

We interpret term 2 of expression (8) in the same way. "Good money" is carried by financial instruments into their complemented social and productive effects by the ways of circular causation between the three variables, as shown in Figure 1. In ISE, the nature of the financial instruments is particularly well-being generating. In ISE, the evasion of interest rates and resource accessibility available to savers in equality of participation of their funds through cooperative mechanism causes diversification of risk by unit production and unit number of shareholders/stakeholders. The total cost by risk and production diversification and the participation of diversity of social spectrum in such participative IIE learning processes mobilizes money into the real economy, thereby increasing social well-being. Unit of changes in financing of the well-being contributing type is enhanced by the total contribution of the circular causation forces of unity of knowledge to the utilization of financial instruments in actualizing well-being. Consequently, in term 2 ($\partial W/\partial F$).($dF/d\theta$) > 0, identically.

The circular causation interrelationship between money and its transmission by financial instruments in the face of alleviating interest rate and replacing it by trade-related financing instruments yield socio-productive consequences. These are realized by mobilizing money into the real economy by way of the coterminous endogenous interrelationship as shown by the unit contribution of socio-economic activity (*E*) to well-being ($\partial W/\partial E > 0$). The total flow of knowledge in the holistic IIE-dynamics causes complementarities between money mobilized into the real economy by the medium of the financial instruments in ISE.

Term 4 of expression (8) disappears. That is because we assume time to be given and invariant within a given socio-economic observation period in reference to the IIE-process. In this sense, each process of the simulacra is treated independently and then connected by events. In the scientific case of mathematical continuity, first, ($\partial W/\partial t$) > 0 in the presence of complementary inter-causal relations between money, finance, and real economy. In this case, a monotonic positive relationship between (θ, $t(\theta)$) yields ($dt(\theta)/d\theta$) > 0.

The nature of financial instruments in ISE facilitates the social flow of micro-economy in the good things of life with the perspective circular causation between such choices. The ISE nature of micro-economy is centered on consciousness that embeds choices in both goods and services and financial instruments, which mobilize resources in the good things of life. The conception of the good things of life in the presence of micro-money connotates life-fulfillment choices and invokes such goods and services, financial and real, that characterize projects of the life-fulfilling kinds. Consequently, the well-being function as defined in Figure 1 comprises the most appropriate objective criterion. The (IIE) learning process nature of the circular causation relational characteristic of the well-being function proceeds in continuity of the domain of knowledge, space, and time. In contradistinction, the mainstream conceptions of welfare and welfare maximization and all similar ones become logically untenable in ISE.

The choices of money, finance, and goods and services with their intertemporal property of continuity over knowledge, space, and time dimensions assume their intrinsic forms within the epistemological derivation from the primal ontological of monotheistic unity of knowledge in ISE. Such primal ontological property of unity of knowledge assumes the extensive participatory (complementary) form. Thereby, micro-money becomes targeted spending in projects and their groupings (mutually inclusive projects, sectors, and their diversifications of extended life-fulfilling kinds). Micro-money in its spending forms in life-fulfilling directions, as we noted using the equation of exchange, principally assumes market orientation. It activates private sector institutions such as Islamic banks in ISE, with the ethical perspective of organic interrelations with the good things of life. The mobilization of micro-money of the kind circulates in interactively integrated ethicizing multi-market system through the operation of Islamic banks and financial institutions that utilize participatory financing instruments. These relations lubricate monetary circulation in an interest-free, debt-free, and non-speculative endogenously mobilized market system. Tradeable instruments accelerate spending in the good things of life.

The consequential circulation representing the circular causation as shown in Figure 1 now takes the following form with the catalytic inner dynamics.

Simulation is done for generating complementarities by improving the signs of the coefficient between the variables of the circular causation system of relations of Figure 1 with the following internal dynamics:

$$[M\uparrow \Rightarrow f\uparrow \Rightarrow r\downarrow \Rightarrow c\downarrow \Rightarrow (P^\wedge \rightarrow 0) \Rightarrow y\uparrow \Rightarrow R\uparrow \Rightarrow E\uparrow \Rightarrow \rho\uparrow](\theta), \qquad (9)$$

where $P^\wedge$ denotes the rate of change in the price level; $(P^\wedge \rightarrow 0)$ denotes the attainment of price stability. This feature of MFE(θ) avoids the problem of monetary plague in the midst of asset-price inflation (Brown, 2015). The chain (9) of interrelations is influenced by the impact of evolutionary learning (simulacra), θ embedded in the circular causation variables. In the MFE circular causation model of the well-being criterion in ISE, which we may now refer to as MFE(θ) circulatory model, the critical levels of complementarities to study are those between the monetary regime characterized by $\{M,R\}[\theta]$; the spending regime $f(r,R)[\theta]$; and the real economy $\{y,E,P^\wedge,R,\rho\}[\theta]$. R is the rate of return on real assets; ρ the technological change; and y the real income.

These MFE[θ]-relations explain that increasing R and stable P levels replaces interest rates (r) and cost of capital (c) with the relationship between inflation ($P^\wedge \rightarrow 0$), money, spending, and real economy circular effects (Benanke and Mishkin, 2007). That is, a certain price target is set. Inflation gravitates toward a zero rate and spells out the endogenous monetary policies needed to maintain the zero-inflation target. Now the Central Bank (CB) becomes a joint venturist with the private sector (commercial banks) in order to promote market deepening and widening. Prices are stabilized under the impact of the target of zero inflation rate. The generalized IIE learning system yields endogenous change with technology (ρ) and the continuous evolutionary learning behavior of the inner variables as shown in expression (9).

In ISE, the embedding of every variable in its pervasively endogenous state by the episteme of unity of knowledge, $\{\theta\}$, derived ontologically from (Ω,S), conveys the endogenous nature of IIE learning everywhere and in everything. $\{\theta\}$ in this organically relational form invokes the essential centricity of moral consciousness. It thereby affirms the epistemic effect of unity of knowledge in both the organic causality of the good things of life and the differentiating effects of ethics-benign regime of economic reasoning. Examples are the depressive effects of θ-induced tradeable financing instruments on interest-bearing ones and the positive effects of tradeable financing instruments on money and finance on real economy spending in (MFE(θ)).

The micro-money transmission mechanism in MFE(θ)

The ethical and endogenous circulatory nature of micro-money in ISE with its circular causal and well-being ramifications, its market orientation approximating money with project-specific spending, and thereby the exactness of valuation of the quantity of money with the value of spending in life-fulfilling regime of development, altogether convey a substantive meaning to monetary transmission. A particular form of the micro-monetary 100 percent reserve requirement monetary system with the gold standard emerges. The particular case of micro-monetary transmission emerges. We examine this topic briefly here.

First, the particular idea of the 100 percent reserve requirement monetary system is presented now. Micro-money in ISE is a market-driven concept induced by the epistemology of unity of knowledge explained in the organic sense of inter-causal relations. Consequently, the financial institutions acquire the specific function of mobilizing savings into productive ends. The phasing out of interest rates enables the productive transformation and socio-economic spending to increase. This leads into the productive interrelationship and transformation of the money, finance, and real economy inter-causality toward raising well-being.

Thereby, Islamic banks exist essentially by virtue of mobilizing savings continuously – and not for holding bank savings – into the real economic activities of ISE. These activities regenerate well-being through the dynamic processes of IIE. The emergent micro-money transmission system thereby engages the Islamic banks in this process of inter-causal relations between the money and real economy via the medium of interest-free, trade-related ethical financial instruments. Islamic banks as financial intermediaries are thereby empowered to hold savings as reserves to continuously mobilize them into purposeful real economic activity. Thereby, the circulation of such reserves and not the holding of bank savings, as in fractional reserve requirement monetary system, is a direct activity in the MFE(θ) system. A 100 percent reserve requirement monetary system is thereby established as a direct market-driven phenomenon in the MFE(θ) system.

In this type of monetary transmission of MFE(θ) system, the CB loses its authority of money creation. CB is thereby sterilized of monetary policing. It acts as a regulator of last resort when a quantity of money is either needed or financial savings are in excess of the demand for loanable funds in the real economy for socio-economic activities. These two cases of the MFE(θ) system result first in $(Mv)_i(\theta) < (T.Y)_i(\theta)$. That is, less money in circulation than the loanable funds is required to match the spending requirement in the real economy. CB becomes a residual lender of last resort for Islamic banks to finance the credit demand of the real economy. The second case is of $(Mv)_i(\theta) > (T.Y)_i(\theta)$. Now there being excess reserve above the loanable funds in demand in the real economy, this excess reserve is held in the CB. Both of these two cases are of a temporary nature. The deficit and excess reserves are liquidated by the regulatory action of the CB as a last resort to bring the equation of exchange to equality, $(Mv)_i(\theta) = (T.Y)_i(\theta)$. This is the regulatory adjusted "balancing effect" in the MFE(θ) system.

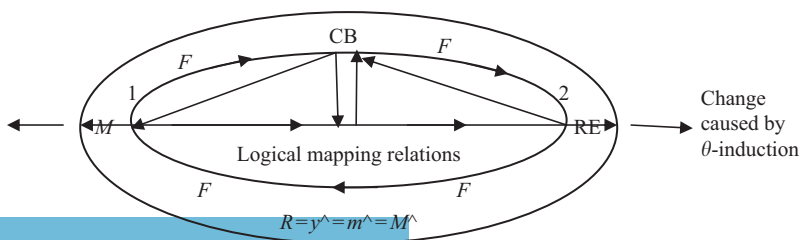Figure 2 shows the three cases of monetary transmission processes in the MFE(θ) system.

Cases 1–3: $(Mv)_i(\theta) = (T.Y)_i(\theta)$ gives an exact matching between the valuation of money and the value of spending in the real economy with, $(Mv)_i(\theta)_F \leftrightarrow_F (T.Y)_i(\theta) \Rightarrow (Mv)_i(\theta) = (T.Y)_i(\theta)$. In this case, no monetary numeraire, like gold and precious bullions, is needed to shore the currency value of money in circulation. The market exchange of the MFE(θ) system determines the real value of currency as valuation of micro-money.

The circular flow of money as savings that are continuously mobilized through the financial institutions in the private sector generates changes in real micro-money as the rate of return arising in the markets of the real economy. In the remaining two cases of excess demand and excess supply of liquidity, the equation of exchange is still established after necessary adjustment of the money regulation as a temporary case of the general endogenous nature of micro-money.

In Figure 2, Case 1 is explained by the direct double-arrow nature of inter-causality between M and RE with F in between. Case 2 is explained by the label 1 denoting, $(Mv)_i(\theta) < (T.Y)_i(\theta)$. Case 3 is explained by label 2 in Figure 2, denoting, $(Mv)_i(\theta) > (T.Y)_i(\theta)$. In every case, after real money economy adjustment, the equation of exchange is re-established along the direct double-arrow explaining monetary transmission in the inter-causal relationships of the MFE(θ) system.

The implication of the 100 percent reserve requirement monetary system is now established. The Islamic bank holds savings as reserve to be continuously mobilized into the real economy. In this ideal case of exact relationship of the θ-induced equation of exchange, there is no need for gold to shore the perfect circulation of money as currency in the market-oriented project-specific activity of micro-money. Now the CB does not hold any statutory reserve. Trade is full and continuous between commercial bank and the real economy through financing instruments and market-driven forces. No interest-barrier exists to create monetary policy such as regulation of prime rate of interest. The circular flow of MFE enhances automatic monetary transmission system in the market economy.

In the imperfect cases of matching monetary flows with the valuation of project-specific spending, a marginal amount of gold is created by CB to shore the currency value in the real economy. Yet this gold-backing is temporary as the equation of exchange adjusts to establish the exact valuation of micro-money with the value of project-specific spending in the real economy.

At the end, the relationship between gold and trade is this: the quantity of gold stock needed in the 100 percent reserve requirement monetary system with gold is inversely related to the volume of θ-induced trade done, and thereby increases (Maritain, 1985). Such a concept of the gold standard in monetary transmission is unlike the traditional meaning of the gold standard. In the latter case, a large volume of gold was needed (Bordo, 1984).

A review of the literature: gold standard and the nature of relationship between money and market exchange: Austrian monetary thought

Within the economic argument of the classical type, the gold standard was thought of as a commodity that could be freely transacted in the market system setting its own prices without government intervention, and thereby, causing a trend in the general price level in goods and services in exchange (Block, 1999). The gold standard was thus thought to be behind the social philosophy of a free market and private ownership economy in which most importantly the individual made free choices without state intervention. It is pointedly noted that over the long-run trend in prices and real transactions determined by the gold standard, there existed a profound stability in the gold price level and inflation rate despite certain short-run exceptions.

In the Austrian contribution to organic learning behavior along trajectories of creative destruction (Schumpeter, 1961), enterprise and innovation (Kirzner, 1997) and evolutionary form of socio-economic development are important issues to examine in the light of how

ethics can be postulated to explain social transformation. Ethics as evolutionary relations between interacting and integrating variables and in the light of the epistemology of unity of knowledge occupied our interest in this paper with the specific focus given to the study of micro-money in a generalized MFE(θ) system model. The organic nature of change, as in a theory of capitalism (Heilbroner, 1985) and modernity, is expressed in the following words by Giddens (1983, p. 44):

> Functionalist theory conceives of society as a system of "present" parts, analogous to the parts of an organic system. What is lacking in this view, in addition to deficiencies previously noted, is the idea of the duality of structure as "binding" the interplay of absence and presence in the *duree* of social interactions. This is indeed a notion which links the moments or instantiation of social activity to the properties of collectivities or social wholes (the structural properties of social systems).

What we notice in the organic meaning of social transformation in the above-mentioned thoughts is a substantive emphasis on the understanding of "process" underlying transformation and transition. But in terms of the end-goal of convergence of all such organic learning, there is simply the enforced direction toward neo-liberalism, democracy, and Occidentalism. All such problematique means that the inherent reasoning self-references by means of a hegemony that is enforced over every other worldview. We find this to be the case with Hegel (1956) in his dialectical explanation of supremacy of Occidental civilization (Garaudy, 1985).

Contrary to such hegemonic driving forces, true logical reasoning needs a natural convergence, and its process to be freely revealed in the scheme of things. This also means to be normatively explained and functionally directed into positive applications. The grand historical process and the science of cybernetics as systemic thinking by the episteme of organic unity of knowledge in "everything" that we referred to earlier must be unraveled in a convincingly natural way. No one can avoid its clarity of vision, except to arrogate over it. If there is no such end-goal for convergence of the human future, then the socio-scientific consequences can only be enforced by power and hegemony. Such a change remains non-sustainable across the great expanse of interrelated totality of free beings.

The entrepreneurship learning model, particularly of the type vouched by the Austrian evolutionary economics school, cannot be tenable over the *longue dure'* in the case of its non-convergent evolution by a natural free will. Examples of this kind are historical evolution of markets, institutions, and ideas under the mainstream liberal and neo-classical perspectives as described by Douglas North (1981). The fact is that, in such an evolutionary historical model of economic transformation, technological change driven by competition and private ownership configures the landscape of human futures. Institutions enable the interrelationships to continue between individuals, economy and society, repeating thus the social contracts based on methodological individualism. Such relations have driven Occidental historiography and portend the future of liberal constitutionalism (Buchanan and Tollison, 1972).

Now by considering Max Weber's kind of entrepreneurship model of capital formation and private ownership of property, asset, capital and wealth, we note that Douglas North and Buchanan's future social worlds as continuation of the historical past involve economy, society, institutions, and individuals that uniformly copy the postulate of methodological individualism in all such embedding. Here, we find methodological individualism as the neo-liberal idea entrenched in both a peculiar understanding of the scheme of things and in human behavior and organizations departing away from the convergent and unifying nature of human community. Yet upon the unifying social constructs, the sustainable communitarianism and its entrepreneurship model rest. Weber's idea of capitalism and its projection in liberal Occidental socio-economic history fails to explain the ethical foundations of human community within an embedded world-system of balance and solidarity, except to impose the hegemony caused by the rise of Protestant Ethics on the acquisition of wealth and power. Such Weberian ethics linked with work and private

ownership mark the entrepreneurship model premised on competition, acquisition, communal distribution, and ownership. This is a case despite Weber's inhering religious overtones in his writings.

Such a nature and dynamics of capitalism (Heilbroner, 1985) and its indelible mark on the economic, social, and political history of the Western World are its own unique and universal worldview of creative evolution across history (Wallerstein, 1974, 1998). Yet it is one of the hegemonic changes. Therefore, it projects a non-sustainable model of human futures (Tisdell, 1989):

RQ1. Why is the episteme of conscious oneness of symbiotic interaction between money, finance and real economy necessary?

Both the answers to the questions are posed here and the status of the prevalent thinking in economics, finance, and society shows that unity of knowledge between these mutually embedded systems and their representative variables is a long forgotten ideal. Reintroducing the episteme of oneness and its functional ontology of unity of knowledge and the world-system into the problem of money, finance, and real economy with the social and ethical essence is a revolutionary project.

Ethics and human systems were deeply ingrained in Smith's theory of moral sentiments (Smith *et al.*, 1984). Ethics is deep in Keynes' economic epistemology of uncertainty, probability and the econometric method (O'Donnell, 1989). In the study of social dynamics and political economy, Hegel blazed the way of thinking along lines of the ethical concept of the World Spirit (Hegel, 1956; Hegel, 1996). Marx (Spechler, 1990) was not an ethicist. Yet the dynamics of social discourse and interaction colored his political economy. The Austrian School of Economics was deeply ethical by virtue of its epistemology of the learning model (Hayek, 1990; Kirzner, 1997).

In the age of Islamic scholasticism almost every single idea was deeply epistemological and invoked the moral law of divine oneness to explain the central Islamic episteme of unity of knowledge in relation to the issues and problems of the world-system. Of particular mention are Imam Ibn Taimiyya and his student Ibn Qayyim (see Islahi, 1988). They both wrote strongly in favor of gold and silver as the intrinsic bullions for the monetary standard. They opposed the policy of the Mamluk dynasty of Egypt during that time, which debased money by replacing gold and silver with copper. The result was a four-hundred percentage increase in inflation in Egypt at that time. Imam Ghazali (undated) was strongly against debasing of gold and silver coins, which were treated as a currency in circulation during that time. A debased coin was valued less because it did not buy the same number of goods as a non-debased currency coin in circulation. Ibn Khaldun (1958) praised the artisans over merchants because of their productive contributions to the national output.

The most important sources of Islamic epistemology of divine oneness and unity of knowledge, namely, the *Qur'an* and the *Sunnah* (Prophetic guidance) present the architecture of symbiosis between "everything." The most powerful explanation of the underlying principle of pervasive complementarities is the principle of complementary pairs in the *Qur'an*[2]. Besides, the model of development in the *Qur'an* is one of the dynamic basic-needs comprising the good choices of life[3]. Upon this principle Imam Fakhruddin Razi formalized his *ubudiyya* (worship theory) theory of life-sustaining goods (Noor, 1998). Imam Shatibi (Masud, 1995) established his well-being theory called *al-maslaha wal-istihsan* (well-being according to public preferences). The Prophet Muhammad had assigned values to smaller denominations of the Islamic Dinar (Gold and silver currency) called *danaq* and *mithqal* in terms of basic foodstuffs (Allouche, 1994; Choudhury, 1997).

These developments in the history of Islamic economic thought amply establish the fact that currency as money was always thought of in terms of its required spending power and ethical role in acquiring the dynamic basic needs of life. Financing of the dynamic

basic-needs regime of development mobilizes real and financial resources in the direction of the Islamic law governing money, finance and real economy inter-linkages within the goal of attaining well-being.

The above inferences relating to the endogenous inter-causal relations between the good things of life in the MFE(θ) system model point to a non-inflationary real economy expansion that becomes possible when knowledge induces technology. This complements simultaneously the expansion of micro-money and finance in their socio-productive absorption by the real economy. The implications of the good things of life as development regime of life-fulfillment needs characterize the non-inflationary expansion possibility of the MFE(θ) system.

Shari'ah implications in ISE

In the analytical study of MFE(θ), Islamic literature is not adequately developed. As a result we note that from Shariah point of view there is no evidence to suggest that money should be based on gold or silver, although this standardization was recommended (Allouche, 1994). Such a treatment of money can be understood from the discussion of many jurists. For example, Misri (1985) stated that during Umar al-Khattab's reign as the caliph, he suggested to use skin of camel as money. However, his suggestion could not be implemented because of short supply of camel skin. Besides it was worrisome that camel skin would not fulfill the equivalent the demand for money. We can therefore deduce that any valuable things can be used as money as long as society can accept it as money and have enough supply of the artifact. Yet there is no discussion among scholars that Umar's suggestion be rejected due to the fact that money could be prepared from gold.

From the point of view of the jurist, Imam Malik, the opinion is that, if skin was used as money, this skin-money should follow the rules of trading in gold and dirham because it takes the role as money which has "thaman" or value (Misri, 1985). Majority of jurists opined that *illah* (effective cause) of *riba* (interest) does not exist in gold and silver because they have value in exchange of goods and services. Besides, any commodity that has similar value like gold and silver should be traded according to the rules of gold and silver, which should be on spot and in equal quantity of counter values.

Ibn Taymiyyah and Ibn Hazm are of the same opinion: any tradeable item can be used as a medium of exchange. According to Ibn Taymiyah even a stick if it has value, may be used as money (Misri, 1985).

Since there is no evidence from the *Qur'an* or *sunnah* as to what should be used as money, the choice falls under the discretion (*siasah shari'ah*) of the ruler (Kamali, 1989). The ruler can introduce any type of money in the country as long as it can be circulated and held by the people in their transactions.

Examples of micro-money and socioeconomic implications

It is obvious that the traditional concept of money and micro-money among the Islamic scholars were deeply flawed according to the present idea of transaction demand of money and its transaction velocity in supply, the equation of exchange. The critical point missed was that although "anything" can be used for money if globally accepted and has liquidity, yet it is the backing of such money on the basis of stable *numeraire*, which is gold and silver, that has been recommended.

Micro-money as a market-driven project-oriented medium of transaction in terms of goods and services exists today. It also has a global acceptance.

Canadian Tire Token Money (https://en.wikipedia.org/wiki/Canadian_Tire_money, accessed November 24, 2017), digital cash money (Tanaka, 1996), and e-money all as endogenous money in circulation across transactions (Choudhury, 1997). According to the

micro-money dynamics economy-wide and globally for the common good, these types of micro-monies can be combined interchangeably.

In the case of Canadian Tire token money, in paper form or coins made at outlets of Canadian Tire stores and approved by the Bank of Canada can be redeemed for discount purchase of goods and services at the Canadian Tire stores or approved other outlets, for example, gas stations. The tokens so exchanged become money by virtue of their circulatory aspect in the purchase of goods and services. If this practice could be increased to a much larger quantity of circulation and exchange, such token money could influence the discounted pricing of goods and services, and thereby the quantity of money in circulation in their "nearest" match with the value of spending in goods and services in transactions. Bank savings would thereby be reduced and mobilization of financial and real resources would be enhanced. The result would then be a reduction of interest rates that arise in bank savings. Thereby, the cost of capital would be reduced.

Another form of micro-money existing today is digital money. Digital form of cash money circulation works by circulating digital cash between exchanging agents with the automatic claim of cash at designated banks that are approved by the agents. Digital cash money thus acts as a promissory artifact to mobilize money and transactions easily between agents with least risk and high mobility. Cost of waiting is reduced to almost zero. Thereby, interest rate as cost of capital on bank savings is reduced. The increase in the velocity of money circulation causes "nearest" best matching between the quantity and valuation of money with the quantity and value of spending in real goods and services. Such spending effects carry with them growth, development, and well-being effects within countries and transnationally. Trade is enhanced. In this case too, we note that with the increase in the popularity of digital cash money in the age of global information technology, large volumes of digital cash money as micro-money could significantly influence price stabilization, generate economic growth, development, and socio-economic well-being that arise from the fast mobilization of resources at decreasing cost of interest.

The combination of the above two kinds of micro-monies generates endogenous money by their "nearest" matching between the valuation and quantity of money in circulation and the real spending value of goods and services at every point of time across the intertemporal time horizon. Each such point along the intertemporal path of matching valuation lowers speculation and risk. Thereby, the cost of capital as interest rate caused by waiting on capital accumulation in bank-savings decreases. The resulting growth, development, well-being and stabilization effects are felt globally.

Likewise, stabilization of exchange rates is realized by basing exchange rates on real transactions matched by quantity and valuation of micro-money with exports and imports. The only requirement to realize such effects is to back up money with a historical stable valued asset. This asset happens to be gold. Hence, the effectiveness of micro-monetary regime is attained in the 100 percent reserve requirement monetary system with the gold standard. Korten (1999) recommended a regime of the above kinds of combined micro-monetary aggregates for enhancing community well-being to defeat the onslaught of financial capitalism.

Thus, the integrated micro-money and real economy inter-bank and inter-country actions are maintained. This leads to global stabilization, growth, development, and well-being as sustainability goals occurring globally.

The IIE character of the money and real economy interrelations is shown by Diagram 2 of Figure 3.

Arrows in Figure 4 shows the IIE convergence between the quantity and value of micro-money (M) and spending (T) by the effect of unifying learning denoted by θ. Consequently, $M(\theta) = (T_p)(\theta) = (S_p)(\theta)$, with velocity of money circulation, $v \sim 1$, according to the concept of "nearest" valuation in 100 percent reserve requirement monetary system with the gold standard. S_p denotes real spending. Thereby, $(dM/d\theta)\uparrow$ and $(dT/d\theta)\uparrow$.
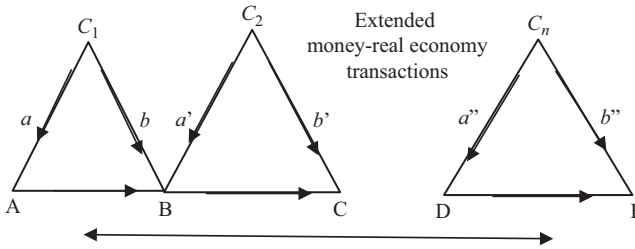
Notes: C_i denotes central banks of countries i, $i=1, 2, \ldots, n$. Ever agent
(bank, exchanging partner) like A, B, C, D, E can likewise exchange
with each other as implied by the double arrows. a' denotes
endogenously determined supply of token micro-money to A by central
bank C_1. Likewise for a', a''; b'. b'', b'' denotes supply of cash payment
equivalent to the supplies of token money between agents (banks,
diverse exchange partners)

Figure 3.
Summarizes the
inter-bank (agent)
global circulation of
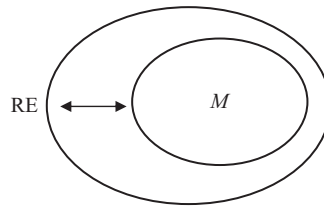micro-money as
digital token
endogenous money

Figure 4.
Digital cash money as
micro-money

Policy conclusion

Today, on the eve of a post-modernist epoch that is dawning on us, the old socio-scientific order is up for questioning and rejection in many ways. This change is giving way to new epistemological roots of intellectual inquiry, discovery, and innovative applications. The Muslim World today is yet to assess its station in this spectrum of novelty according to its own episteme of knowledge and life. So far she has failed on all fronts. The aftermath of a global political economy of disorder and fragmentation is upon her.

Among the many issues that assume a center stage in new perspectives of the globalization scene for the Muslim World, which we refer to here as global transformation with social and ethical contexts, will be the nature of money, monetary policy, monetary transmission, and institutions, and their endogenous inter-causal relationship with the real economic transactional basis of sustainable development under the episteme of unity of knowledge. In this respect, by keeping in view the micro-money, finance and real economic interrelationships, the automatic stabilization, sustainability, and well-being effects of an interactive, integrative, and dynamically evolutionary (IIE) order and the challenging new methodology and methods premised on the unity of knowledge reign foremost. This is also the ISE worldview. The ensuing critique of the mainstream economic reasoning in this paper has opened up new dimensions for serious investigation in heterodox social economics considering the MFE(θ) as an example.

In the light of monotheistic inclusiveness in a theory of "everything" that would expand the scope and deepen the explanatory power of science, economics, finance, and society, academia ought to break down the walls of differentiation that divide the monotheistic methodological worldview from that of science and the social entirety. The resulting totality we refer to as the overarching field of human intellection includes the general, unique and

universal theory of "everything" in the form of an interactive, integrative, and the evolutionary learning world-system. We refer to such a methodological unified totality as the socio-scientific order. Its methodology is premised on the epistemology of unity of knowledge. The realm of this socio-scientific unification is governed by textual laws and their applications arising out of the good things of life. The good things of life are the unifying ones in abstraction and materiality arising out of the life-fulfilling regime of moral actualization. The moral foundation of the immanent methodological worldview thereby, generates ethical endogeneity in the form of organic circular causation relations, as by IIE-learning processes across systems.

Notes

1. *Qur'an, Kahf*, Chapter 18, verse 19 implies how money is a moral and ethical entity, a manifestation of the sign of monotheistic unity, and that value is induced by the ontological law – $\{M\}$ as money induced by $\{\theta^*\}$ in simulacra of defining evolutionary learning of the ontological derivation, epistemological reconstruction, and continuity of functional ontologies recursively derived in identical ways across events, $\{E(\theta, M, F, E, t)[\theta]\}$. The *Qur'an* (18:19) declares in this regard: "[…] So send one of you with this silver coin of yours to the city and let him look to which is the best of food and bring you provision from it and let him be cautious. And let no one be aware of you".

2. Qur'an (36:36): "Glory is to Him, Who has created all in pairs of that which the earth produces, as well as of their (own) human kind, and of that which they know not".

3. The design of pervasively connected and diversely rich world-system is one that is morally induced by laws, reason and directions to create well-being and plenty. On this the Qur'an (14:24-25) declares: "See you not how Allah sets forth a parable? A goodly word like a goodly tree, whose root is firmly fixed, and its branches (reach) to the sky, giving its fruit at all times, by the leave of its Lord, and Allah sets forth parables for mankind in order that they may remember".

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Corresponding author
Masudul Alam Choudhury can be contacted at: masudc60@yahoo.ca