Social Provisioning Process and Socio-Economic Modeling

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Abstract

The radical difference between orthodox and heterodox economics emanates from the different views of the capitalist socio-economic system. Economics as the science of social provisioning felicitously describes the heterodox view that economy is part of the evolving social order; social agency is embedded in the social and cultural context; a socio-economic change is driven by technical and cultural changes; and the provisioning process is open-ended. Such a perspective on economy offers ample methodological and theoretical implications for modeling the capitalist economy in a realistic manner. It lends itself especially to the micro-macro synthetic approach. Thus the objective of this paper is twofold: 1) to examine how the concept of the social provisioning process can be clarified and expanded by virtue of recent development in heterodox methodology and 2) to discuss how methodological development would nourish the heterodox modeling and theorizing of the capitalist social provisioning process.

Keywords: Social provisioning process, heterodox economics, social fabric matrix, system dynamics, social surplus approach

JEL Codes: B41, B51, B52

Economics is a science of thinking in terms of models joined to the art of choosing models which are relevant to the contemporary world... economics is essentially a moral science and not a natural science... The specialist in the manufacture of models will not be successful unless he is constantly correcting his judgment by intimate and messy acquaintance with the facts to which his model has be to applied. (Keynes 1994, 286-8)

1 Introduction

Ever-changing society is never stable because of conscious actions and interactions of social agency. A historical change in socio-economic structures is unpredictable but is always controlled by the dominant social agency of the time. Capitalist markets are formed and governed by social agency being vested with social-economic-political power. The vested interests are protected in the process of the provisioning of goods and services. To do so, resources are made available by the command of the dominant agency. While consumption is dependent upon those who make production decisions, production is dependent upon the expectation of profits. The provisioning of goods and services is thus a social process rather than an isolated rational decision making process. Such a story is not told or adequately theorized by neoclassical economists who rely exclusively on the isolated optimizing behavior given scarce means. No institution in its broadest sense presents itself in neoclassical economics. Nor do embedded individuals and embedded economy.

The significance of the view that economics is the study of the social provisioning process lies in its relevance to the account of ever-evolving economy. With the social provisioning process, as a method of inquiry into social reality, a theory assisted by a model would provide deeper understanding of how provisioning of goods and services of a society is organized in accordance with existing values and social structures—including, but not limited to, class, gender, culture, power, politics, and environment. It is also well acknowledged now by many heterodox economists that, given the contested disciplinary landscape, the concept of social provisioning is a useful guidepost for the development of heterodox economics. Institutionalists, Post Keynesians, Marxians, social economists, feminists, ecological economists, among others, have made valuable contributions to the advancement of heterodox economics with the view of the social provisioning process (Gruchy 1987; Stevenson 1987; Dugger 1996; Lee 2008; Lawson 2003; 2006; Davis 2006; Power 2004).[1]

[1]Heterodox economics refers to historically grounded theories of the social provisioning process and the community of economists who produce such theories. Heterodox economics is in its nature

An important implication follows. The concept of social provisioning offers a way to promote much-needed cross-communication of ideas within various heterodox economics traditions as well as with other like-minded social scientists who are free of neoclassical values and methods. This can be the case since the social provisioning perspective is a comprehensive view, as described in the opening paragraph and further details below, that reflects the concern of the historical development of human beings and society. In other words, the social provisioning perspective is the social ontology that looks into the foundations of socio-economic evolution.

The objective of this paper is to conceptually elaborate the social provisioning process with the close reference to the core principles common to various heterodox economic traditions. This effort will render heterodox modeling distinctive from and alternative to orthodox-neoclassical modeling. To this end, this paper is organized in the following order. The second section discusses the meaning of the social provisioning process and finds implications for modeling the socio-economic system. In the following section, selected heterodox models—the social fabric matrix, system dynamics, the social surplus approach—are compared and contrasted from a social provisioning perspective. The final section concludes the paper.

2 Social Provisioning Process

2.1 Conceptualizing the Social Provisioning Process

Almost all economists, either heterodox or otherwise, believe that they are explaining the real world. But it is well known that the level of inquiry and the way of making a theory are radically dissimilar. Orthodox economics of our time is primarily concerned with building a model qua theory based upon axiomatic assumptions such as scarce resources, hedonistic-rational *homo economicus*, the isolated decision-making process, and disembedded economy. A good model is then expected to yield a higher degree of predictability by ascertaining the empirical regularity between quantitative variables. A century-old tradition of model construction in a formal-mathematical fashion has led orthodox economics to the high state that only trained economists fully understand what the model explains. The reality is obscured rather than explained; or it is the manufactured reality that is explained by refined models.

pluralistic rather than monistic, social rather than individualistic, open rather than closed, procedural rather than equilibrial, value-directed rather than value-neutral, retroductive rather than deductive, dynamic-evolutionary-historical rather than static-optimal-ideal (O'Hara 1992; Dugger 1996; Lawson 2006; Power 2004; Lee 2008).

Take an evolutionary game model as an example. It is designed to address a strategic decision-making process by incorporating bounded rationality, mutative behavior, path-dependence, and the interactive influence between agents over time. These are not considered in the static game model (McKenzie 2009). With the help of the development in computational technology like simulation, it becomes easier to show the complex evolutionary process that leads to an evolutionary stationary solution. But still fundamental problems of a game model remain untouched. One of critical problems is that the initial model setting can be manufactured so as to obtain a particular outcome. Not to mention, an evolutionary game model does not question how a set of agents' strategies, a payoff function, and the rule of the game are constructed and changing, because it begins with the "elimination of society, relationships therein, and historical movements thereof" (Henry 2009). Consequently, the model world is too limited to explain the changes in real history and thereby the "evolutionary approach loses all its analytical power the moment it allows humans to do what they have been doing throughout history" (Varoufakis 2008, 87).

On the contrary, heterodox economists have not been bothered much by the mathematical model. In its place, the emphasis is put on the reality (of the model). It is the quantitative rigor that is to be sacrificed, if either the rigor or the reality is to be chosen. This is due largely to the fact that the reality that heterodox economists, Post Keynesian, Marxians, and Institutionalists in particular, perceive is much deeper than what orthodoxy does. That is, social reality is layered and open. The structure of society is open in historical time because of conscious social agency and the persistent causal mechanisms that are not always observable. For the sake of explaining ever-changing society, therefore, both 'intensive' (causal-substantive) and 'extensive' (positive-empirical) investigations are required. Such a methodological position further implies that social transformation (or elaboration at a lesser degree) can be made not through the manipulation of empirical variables but through the changes in structures driven by agency (Polanyi 1968; Archer 1995, ch. 10; Danermark et al. 1997, 10 and 165; Park 2001; Dow 2005, 388).

We find such a realistic reasoning in a variety of heterodox traditions. Consider Marx:

> In the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given state of the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation, on which arises a legal and political superstructure and to which correspond definite forms of social consciousness. The mode of production of material life conditions the general process of social, political and intellectual life. (Marx 1970, 20-21)

Consider now Veblen:

> [A]n adequate theory of economic conduct, even for statical purposes, cannot be drawn in terms of the individual simply—as is the case with the marginal-utility economics—because it cannot be drawn in terms of the underlying traits of human nature simply; since the response that goes to make up human conduct takes place under institutional norms and only under stimuli that have an institutional bearing; for the situation that provokes and inhibits action in any given case is itself in great part of institutional, cultural derivation. Then, too, the phenomena of human life occur only as phenomena of the life of a group or community... The wants and desires, the end and aim, the ways and means, the amplitude and drift of the individuals conduct are functions of an institutional variable that is of a higher complex and wholly unstable character. (Veblen 1909, 629)

Keynes addresses his view of economics in a similar manner:

> Economics is a science of thinking in terms of models joined to the art of choosing models which are relevant to the contemporary world. It is compelled to be this, because, unlike the typical natural science, the material to which it is applied is, in too many respects, not homogeneous through time. The object of a model is to segregate the semi-permanent or relatively constant factors from those which are transitory or fluctuating so as to develop a logical way of thinking about the latter, and of understanding the time sequence to which they give rise in particular cases... It the second place, as against Robbins, economics is essentially a moral science and not a natural science. That is to say, it employs introspection and judgments of value. (Keynes 1994, 286)

Despite the well-known theoretical differences between Marx, Veblen, and Keynes, there is a common theme that unites these 'worldly philosophers' and that sharply distinguishes heterodox economics from orthodox economics. They offer causal explanations of the social provisioning process. This is in radical contrast to the orthodox view that "Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses" (Robbins 1932). Then what do we mean by the social provisioning process? In brief (further discussion follows below), it means that all the economic activities are occurring in a social context—cultural values, class/power relations, norms, ideologies, and ecological system. With

this theme, a serious inquiry into economic matters requires the deeper understanding and thicker explanations of the foundations of society. Marx, for example, explains how the capitalist mode of production controlled by a minority ruling class gives rise to social ills (alienation and exploitation), disorder (crisis), and irrationality (commodity-money fetishism). Veblen intensively explicates how a social evolution is conditioned by underlying dichotomous forces—business principles and social principles, and how the ruling class maintains its vested interests. Keynes furthers these ideas by advancing the theory of monetary production and the principle of effective demand to the extent that the production of surplus goods and services as a material basis of society is determined by the demand decisions made by the business enterprises and the capitalist state. (Henry 2009; 2011; Howard and King 1992, ch. 5; Bortis 1997, ch. 3; Lee and Jo 2011).

It was Allan Gruchy who popularized the concept of the social provisioning process. He defines that:

> [E]conomics is the study of the on-going economic process that provides the flow of goods and services required by society to meet the needs of those who participate in its activities... [economics is] the science of social provisioning. (Gruchy 1987, 21)

From the Institutionalist perspective, Gruchy (1987, 21-23) maintains that the social provisioning process is cultural, historical, technological, open and thereby economics is to be interdisciplinary and pluralistic so as to explain potential material abundance as a basis of social progress. Such a view of economics is, as Polanyi (1968) argues, distinctive from the mainstream view that is so limited that it can only be applicable to market activities. Heterodox economists have long recognized that human society is organized by both market and non-market activities; economic activities take place, and thus have meanings, in a social context. According to Polanyi, economy is

> an instituted process of interaction between man and his environment, which results in a continuous supply of want-satisfying material means... The human economy, then, is embedded and enmeshed in institutions, economic and noneconomic. The inclusion of the noneconomic is vital. For religion or government may be as important for the structure and functioning of the economy as monetary institutions or the availability of tools and machines themselves that lighten the toil of labor. (Polanyi 1968, 145, 148)

By the same token, Veblen maintains that there are two sorts of knowledge, speculative (mathematical) and scientific (causal analysis), which are under the influence

of prevalent institutional setting (or the predominant conventional wisdom and the vested interest). The former is logical exercise that is distant from real life experience (hence ceremonial and institutional), and the latter is workmanlike knowledge closely associated with material exigency (hence, technical and instrumental). Mathematical/statistical formulations reflect, continues Veblen, no more than observed 'idle quantitative concomitance' of the reality, while cumulative causation "is a fact of imputation, not of observation, and so cannot be included in data" (Veblen 1961, 32-35).[2]

Not surprisingly many other heterodox economists find social provisioning germane to heterodox economics. For example,

> "Social provisioning" is a phrase that draws attention away from images of pecuniary pursuits and individual competition, and towards notions of sustenance, cooperation, and support. Rather than be naturalized or taken as given, capitalist institutions and dynamics become subjects to be examined and critiqued. (Power 2004, 6)

And Frederic Lee defines heterodox economics explicitly from the social provisioning perspective:

> [H]eterodox economists extend their theory to examining issues associated with the process of social provisioning, such as racism, gender and ideologies and myths. Because their economics involves issues of ethical values and social philosophy and the historical aspects of human existence, heterodox economists make ethically based economic policy recommendations to improve human dignity, that is, recommending ameliorative and/or radical, social and economic policies to improve the social provisioning and hence well-being for all members of society and especially the disadvantaged members. (Lee 2008)

2.2 Implications for Modeling

Then one would ask: Why is the concept of the social provisioning process important for heterodox economics? We find that there are at least four implications that are

[2]These principles are shared and elaborated by many later Institutionalists. To summarize, institutionalism is (to be) cultural, complex, historical, realistic, emergent (or anti-reductionist), open-ended, path-dependent, dynamic, phylogenetic, and evolutionary (Dugger 1996; Tilman 1996; Mayhew 1998; Mearman 2002; Hodgson 2004).

relevant to the present purpose—that is, linking the social provisioning process and socio-economic modeling.

Firstly, heterodox economists can do away with impersonal market fundamentalism. Placing social provisioning at the center of an inquiry, one starts a study with a purview of the capitalist socio-economic system which includes social agency, socio-economic structures, and causal mechanisms. Then economic activities, both market and non-market activities, such as self-interested and cooperative behaviors, control and resistance, accumulation of capital, and provisioning of welfare can be explained in a comprehensive manner. That is, market provisioning is a subset of social provisioning (Dugger 1996; Power 2004). The material basis of social provisioning is the structure of production, technology, and natural environment, the social basis is socio-economic classes, and the cultural basis is the society-specific value system (including a set of norms and beliefs) (Hayden 1982; Stevenson 1987; Lee and Jo 2011). These bases qua structures are made open by social agents through causal mechanisms.

To illustrate this point, the production of surplus goods are determined by the capitalist agency given technical conditions (that determine the use of various inputs), its capitalist value (the business principle—efficiency and profitability rather than serviceability). In turn investment, employment, financing decisions follow. In the society where the absentee ownership and its vested interests are dominant, the provisioning of goods are coordinated in favor of the vested interests of the capitalist agency. In another society where social cohesion and environmental concern are emphasized over the business principle, the production and distribution of surplus goods are coordinated following a different causal mechanism. Consequently, the social surplus consists of the goods and services determined by the values and forces that create the social activities which the provisioning process underwrites (Adams 1991; Clark 1992). Therefore the social provisioning perspective, when it is dealt with carefully, enables us to understand the fundamentals of the socio-economic system and their consequences on human agency and the ecological system, while neoclassicism, as defined by Robbins (1932), does not allow one to go wider than market exchanges.[3]

Secondly, both methodological individualism and methodological holism become irrel-

[3]Another notable example that reveals the sharp difference between 'two views' is development economics. From the orthodox point of view, the foremost obstacle to development of an economy is the scarcity of resources. To promote economic growth and development, they suggest the mobilization of resources (including labor force), the liberalization of domestic markets to attract foreign capital, and the like. However, from the heterodox perspective, it is not necessarily the lack of resources that hinders an economy from developing. The major obstacle to development is the lack of technical progress defined in its widest sense (including organizational techniques, knowledge and learning process, and institutional set-ups) that would increase the capacity of agency and hence facilitate social provisioning within the economy (see Kregel 2004).

evant to the explanation of the social provisioning process. In other words, rather than the pseudo-interaction between individuals and commodities (as in individualism and neoclassicism in general) or between structures (as in pure structuralism), it is the genuine interaction between social agency and structures that are to be understood and explained. In the course of such an interaction, there emerge institutions—for example, rules, values, norms, and conventions—that constitute and transform the structure of society. Therefore, the qualitative linkage "between the 'social' and 'systemic'" or "between 'action' and its 'environment'" is to be the primary subject of heterodox economics (Archer 1995, 11). And Veblen makes this point clearly that the evolutionary process is the result of interactions between active social agency and evolving institutions.

> [A]n adequate theory of economic conduct, even for statical purposes, cannot be drawn in terms of the individual simply—as is the case with the marginal-utility economics—because it cannot be drawn in terms of the underlying traits of human nature simply; since the response that goes to make up human conduct takes place under institutional norms and only under stimuli that have an institutional bearing; for the situation that provokes and inhibits action in any given case is itself in great part of institutional, cultural derivation. Then, too, the phenomena of human life occur only as phenomena of the life of a group or community... The wants and desires, the end and aim, the ways and means, the amplitude and drift of the individual's conduct are functions of an institutional variable that is of a higher complex and wholly unstable character. (Veblen 1909, 629)

Thirdly, it follows from the above discussion that the conventional micro-macro dichotomy is a limited analytical apparatus. The account of social provisioning requires heterodox microfoundations of macroeconomic outcomes that offer beyond fallacious neoclassical microfoundations. Alternatively, heterodox microfoundations begin with the active human agency embedded in the social provisioning process. And the theoretical focus is the in-depth analysis of the historical or evolutionary process. As a result, real social agency and emergent institutions are taken into account as the driving force of social provisioning. That is to say, in the complex and open social provisioning process, the free transition between micro and macro is not possible. The linear linkage between cause and effect should be avoided. In this context, as mentioned earlier, it is social agency that makes the system open and going (Jo 2007; Lee 2010).

Lastly, when it comes to the *capitalist* social provisioning process, the understanding of class, dominance, power, control, and regulation becomes important. Unlike the market provisioning process in which vendible goods and services are exchanged through the

price mechanism, the analysis of social provisioning calls for explanations on how the social product is generated, how the social surplus is created, how agents gain access to and engagement in the social provisioning process, and how social institutions including market institutions are organized and controlled so as to ensure the class interests, the reproduction and stability of the capitalist system. Indeed, these issues have long been discussed by many heterodox economists. The social provisioning perspective would induce further development.

To summarize, heterodox economics distinguishes itself from the orthodox economics by taking social provisioning as its methodological core. Consequently, with social provisioning a heterodox theory or model provides us with a more realistic and comprehensive account of the issue in hand. This is the starting point of the following section in which selected heterodox socio-economic models such as the social fabric matrix, system dynamics, and the social surplus approach are discussed from the social provisioning perspective.

3 Socio-Economic Modeling

3.1 Models in Heterodox Economics

Orthodox economists are nearly in total agreement on using formal models.[4] Heterodox economists are, however, divided in their position on formal models. Some argue that heterodox economists should make more use of formal methods such as game theoretic models and econometric tools with more realistic assumptions. They believe that developing heterodox theory in a formal manner would render heterodox economics more popular so that there will be productive scholarly communications between the heterodoxy and the orthodoxy (Colander 2003; Colander, Holt and Rosser 2004; Radzicki 2003).

[4]Even the difference between a model and a theory is hardly discerned in orthodox economics. Consider the Solow growth model (Solow 1956). It is a simple and abstract model with a set of strict assumptions—a closed economy without the state, the CRS aggregate production function, saving determines investment, and investment determines capital accumulation. The model generates the steady state of an economy that depends mainly upon the rate of technical growth. This is *the* neoclassical growth theory. This theory does not go beyond the idealized model world, even though some of the strict assumptions are relaxed by later neoclassical economists. Heterodox economists, however, believe that a theory is to explain the real social provisioning process and it can be assisted by an abstract *and* realistic model (Fleetwood 2011, 23). That is, orthodox economists idealize social reality so as to gain predictability through a formal model, whereas heterodox economists object to idealization and instead opt for abstraction in order to grasp the reality.

Many other heterodox economists are skeptical about developing heterodox theory in a formal way since the formal method is a fundamentally limited way of analyzing social reality that is historical, complex, and open (Baran and Sweezy 1965; Eaton 1965; Georgescu-Roegen 1979; Rima 1994; Sugden 2001; Lawson 2003; Varoufakis 2008). Perhaps the strongest rejection to mathematical formalism is explicated by Tony Lawson. He argues that neoclassical economics relying exclusively on the formalistic, deductive, closed-system method is destined to fail to grasp constantly changing, interconnected, and structured social reality. An overt example is the failure of neoclassical economics in the account, *ex ante* and *ex post*, of the financial crisis of 2008 (Lawson 2006; 2009).[5]

In short, it is clear in skeptics' view that the fundamental difference between orthodoxy and heterodoxy is the view of social reality that leads to distinctive theories and methods. From the heterodox point of view, society is peopled, structured and organized so that the real world is more complex than the model world established by the best available mathematical tool. Indeed, the quantitative method is serviceable to the extent that it is properly used to capture *ex post* reality or demi-regularity (Lee 2002, 795-6; Lawson 2003, 105-6). Therefore, whether using analytical-historical narratives or quantitative models, what is important for conducting heterodox analysis is to provide causal explanations of the social provisioning process in which active human agency is fully operational. If a theory or a model is taken for granted without recourse to social reality, "then man is not a "prime mover." Rather, humans, and society as a whole, merely respond to extra-societal laws and forces over which they exert no control" (Henry 1986, 382).

Consequently, a constructive strategy for the development in heterodox economics would be to better explain the social provisioning process without losing social agency, emergent social institutions, underlying structures and cultures, and the instability and/or reproduction of the system as whole. To this end, various models can be utilized as a means of inquiry. That is to say, models are to be designed to provide "actual explanation" rather than "conceptual exploration" (Sugden 2002, 117).

As discussed in the following section, heterodox models are, more or less, built with the emphasis on actual-historical explanation. Examples of such models are the social fabric matrix, system dynamics, and the social surplus approach. A caveat is in order here. In this special issue of the *Journal*, a list of heterodox models, if not exhaustive, is investigated and integrated one way or another. Therefore, the present paper does not mean to deal with all those heterodox models. Instead, three selected models are examined from the social provisioning perspective for the sake of finding constructive implications for developing heterodox models.

[5]We may add here that if the cause of the problem lies at the methodological core of orthodox economics, an alternative or more complex formal model would not be the solution to this failure.

3.2 Social Fabric Matrix

The social fabric matrix (SFM, hereafter) is an Institutionalist analytical tool designed to "assist in describing the system and providing the data base for evaluation, planning, especially for a complex technological society" (Hayden 1982, 653). To this end, the socio-economic system is divided into five fabrics—values, beliefs, institutions, technology, and environment—that are linked (in the sense of 'delivering' to and 'receiving' from one another) through three organizing principles—reciprocity, redistribution, and exchange. This is the general SFM framework and of course some components can be temporarily left mute when they do not play a significant role in the matrix of a society in question. For example, Hayden (2009*b*) illustrates the SFM of Nebraska state aid for a local K-12 public school system. In this case study, the defining components of SFM are social beliefs, authority institutions, and processing institutions. That is, SFM is flexible such that it can be built for different levels of inquiry.

As developed from the Institutionalist perspective (including Thorstein Veblen, John Commons, Clarence Ayres, Karl Polanyi, and Allan Gruchy), SFM is firmly grounded in the process of social provisioning. This methodological ground makes SFM comprehensive and realistic to the extent that the real social domain as well as the economic domain are organically integrated into SFM. That is, the input-output matrix and analytical techniques associated with it can be readily integrated into SFM. This fact further implies that economic activities are embedded in and interdependent with the surrounding social domain that is composed of institutions (including, but not limited to, rules),[6] culture (values and beliefs), environment, and technology.

Another notable advantage of SFM is its capacity to illustrate the inextricable linkage between the micro and the macro in the social provisioning process. Hayden puts it:

> The matrix is meant to capture the characteristics of the parts, as well as the process of the whole. This is accomplished by a nonequilibrium, non-common denominator process matrix,... there is no final demand, absolute requirement, or end to the process. (Hayden 2009*a*, 645)

[6] It is worthwhile to note that neo-Schumpeterians tend to equalize rules to institutions in the evolutionary process, following the Schumpeterian tradition rather than the Veblenian tradition. So it becomes the matter of making/innovating rules by independent-capable individuals (i.e. entrepreneurs) (Dopfer, Foster and Potts 2004; Dopfer and Potts 2004). Hayden (2009*b*) and Elsner (2007) argue that such a viewpoint is problematic since agents without power, value, beliefs, and social relations do not exist. As the social provisioning process maintains, an agent is not an isolated and passive individual. Social agency makes not only rules but also structures.

In a nutshell, a SFM (like an input-output table) is a structure that mirrors the correlations among various elements in a society. To explicate causal relations, the identification of involving social agency and causal mechanisms is of necessity. Once it is successfully done, the SFM become an open-system; it provides insightful causal explanations on how such a socio-economic system is organized, changing, and transformed by agency.

Apparently, SFM is a realistic and sophisticated model in describing internal structures and complicated internal interrelationships (dependence and feedbacks) of the socio-economic system. But SFM is not without weakness and difficulty. One difficulty is that SFM can be a huge matrix, if it tends to be more comprehensible. A model builder's reasonable judgment call and justification is thus necessary to make a SFM manageable. Related with the point just made, one weakness can be addressed. How is the instability of the socio-economic system as a whole explained? Or how does a radical change in the system happen as we experience in the real history? To answer these questions concerned most by heterodox economists, the SFM requires incorporating dynamic aspects of socio-economic domains as well as causal explanations of interactions between agents—in particular, between those who are controlling the process of social provisioning and those who are ruled.

3.3 System Dynamics

Another heterodox model of interest from the author's point of view is system dynamics (SD, hereafter). This model shares many components and principles with other heterodox models, in particular with SFM. It is, however, argued here that SD is often inconsistent with the social provisioning perspective delineated above due mainly to some elements borrowed from orthodox economics.

According to Radizicki, "[s]ystem dynamics is a computer modeling technique originally developed by Jay W. Forrester... for the purpose of simulating socioeconomic systems in a realistic manner" (Radzicki 2010, 3). He points out the essential properties of SD:

> It is dynamic, disequilibrium approach to modeling complex systems that portrays human behavior and micro-level decision making as it actually is (i.e., bounded or procedural rational goal seeking) rather than it might be in an idealized state... The system dynamics modeling process is aimed at creating of a decision maker's mental model (consistent with any available numerical data or written information) so that it is made precise and its underlying assumptions are stated and open to inspective by others. In

> addition, since a system dynamics model can be simulated on a computer, the modeling process enables the dynamic behavior inherent in a decision maker's mental model to be accurately revealed. (Radzicki 2003, 138, 151)

Apparently, a SD model is composed of three parts (or phases): a set of assumptions, descriptive relations (stocks, flows, feedbacks, and limiting factors), and simulations (projected changes over time). Consider a SD model of three firms competing for a greater market share (Radzicki 2003). It begins with a set of assumptions—three virtual manufacturing firms with equal initial market share, identical products, price competition, price change by increasing either quantity or efficiency. At the second phase of the model, the behavior of each firm is described by the changes in stocks of production and knowledge through the learning-by-doing process. The third phase is the simulation of the market share for each firm. Consequently, Radzicki finds the implications of the model as follows:

> What is clear from the simulations,... is that the behavior of the model is emergent and path dependent. The time path each firm will take during any simulation run is not knowable from inspection of their microstructure, and the dominant firm can be different from run to run. The model does a nice job of illustrating the importance of efficient production, learning by doing, learning from rivals, and protecting proprietary production methods. (Radzicki 2003, 163-4)

Indeed, as far as the above SD model is concerned, it is useful to the extent that the model results correspond to the reality in question. And the model clearly manifests that both microstructure and the system as a whole are to be considered in order to fully understand the interdependent evolutionary process over time (Radzicki 2010, 6). The model results, however, are not novel. Strategic and path dependent decision making process under uncertainty, importance of knowledge and legal institutions, and the like are well articulated by many heterodox economists. For the sake of constructive discussion, additional problems in the SD model can be pointed out.

Firstly, it may be necessary to tame the real world to find systematic causes and effects related to an issue in hand. However, assumptions made in the SD model are very unrealistic. It is hardly possible to represent actual business activities as in the above SD model. In other words, "system dynamics work is usually completed with made-up components, relationships, and data that are not based on real-world findings" (Hayden 2009*a*, 1062).

Secondly, the notion of (dis)equilibrium is problematic. SD requires the equilibrium state (and thereby the system be closed) at the initial stage in order to generate the dynamics of the system. Otherwise, it is hardly possible to find meaningful outcomes concerning a shock–responses–change process (Radzicki 2010, 20, fn 12). The genuine social provisioning process, however, has nothing to do with an equilibrium or disequilibrium (see Robinson 1980; Henry 1984-85).

Lastly, a good SD model is the one that "[makes] sure that the model's structure and behavior correspond as closely as possible to those of the real-world system experiencing the problem. As more tests are passed, more confidence is generated in the model's results" (Radzicki 2010, 7). This statement rings a bell. Robert Lucas, one of leading neoclassical economists of our time, notes that:

> A 'theory' is not a collection of assertions about the behavior of the actual economy but rather an explicit set of instructions for building a parallel or analogue system—a mechanical, imitation economy. A 'good' model, from this point of view, will not be exactly more 'real' than a poor one, but will provide better imitations. (Lucas 1980, 697)

At a more fundamental level, one may wonder how SD explains a qualitative or radical change in the system itself, and how the system behavior is different from agent's real behavior and from the real historical change. SD is limited in these respects that are essential for the causal explanation of the social provisioning process.

3.4 Social Surplus Approach

The social surplus approach has a long history. The social surplus as a net product (or final goods and services) was first conceptualized by François Quesnay's *tableau économique*. Classical political economists, especially Ricardo and Marx, articulated the production and distribution of the social surplus. In so doing a set of 'givens' are assumed: (1) the production technology, (2) the level and composition of social product, and (3) real wage rates determined by the size of the industrial reserve army (in Marx) or at the subsistence level (in Ricardo). Later, Sraffians reconstructed the classical surplus approach concentrating on the determination of price of distribution. The social surplus approach sheds a flood of light on the fact that the social surplus is the material basis of the capitalist economy, that the production of the social surplus depends directly on the social process of production, and the distribution of the social surplus depends upon the structure of social classes and the power relation therein.

However, due to the second assumption above, the determination and composition of the social surplus is not dealt with in both the classical and Sraffian surplus approach (Bortis 1997, 91-95; Lee and Jo 2011).

With the social provisioning process as the methodological foundation, the conventional social surplus approach can be altered without losing its key insights. The process of social provisioning consists of social agency, social structures, and causal mechanisms. It is embedded social agency who makes decisions. More specifically, it is the capitalist class agency (for example, the business enterprise) and the capitalist state that make the decision on the production of social surplus so as them to maintain and expand socio-economic privileges. In this regard, given production technology embodied in the input-output matrix of the economy, the total social product is determined by agent-based expenditure decisions and economic activities are organized and directed toward the creation of the surplus. That is to say, the social product is not given but determined by the expenditure decisions through the Keynesian-Kaleckian effective demand. Hence, the social surplus is not a residual.[7]

The social surplus approach coupled with the social provisioning process offers following theoretical implications. First, the decisions to produce the social surplus coordinates economic activities by requiring the various basic industries to produce the goods and services for the production of the social surplus. Second, the level and composition of the social surplus are determined by the class-oriented values that direct the social provisioning process. That is, the objective of the production of the social surplus is to provide for the social provisioning process. Thirdly, unlike the conventional social surplus approach, the 'heterodox' social surplus approach delineated here requires both micro and macro accounts since agents' strategic decisions (real micro behaviors) are made with a view to overall and future economic conditions (real macro conditions). Finally, a model of the social surplus is an open system in two senses; one being that social agency makes real decisions that reproduce the system, the other being it can be incorporated into a more general model of an economy (like SFM) insofar as the latter is open and is consistent with the social provisioning process.[8]

[7]For more detailed exposition of a model of the production of the social surplus, see Lee and Jo (2011).

[8]For this matter, see Frederic Lee's paper appearing in the present issue of the *Journal*.

4 Conclusions

Heterodox economists have advanced their theories in a markedly different manner from the orthodoxy. The difference is in the first place the view of social reality captured by the social provisioning process; all the economic activities are occurring in a social context—cultural values, class/power relations, norms, ideologies, and ecological system. With this view, a serious inquiry into economic matters requires the deeper understanding and thicker explanations of the foundations of society. Further implications that are relevant to the model building from the social provisioning perspective can be summarized as follows:

(1) Impersonal market fundamentalism supported by orthodox economics is readily rejected. Instead, market provisioning is treated as a subset of social provisioning whose material basis is the structure of production, technology, and natural environment, whose social basis is socio-economic classes, and whose cultural basis is the society-specific value system.

(2) With the social provisioning process as a means of inquiry, both methodological individualism and methodological holism become irrelevant. That is, rather than the pseudo-interaction between individuals and commodities or between structure, it is the genuine interaction between social agency and structures that are be understood and explained.

(3) The conventional micro-macro dichotomy is to be rejected. The account of social provisioning requires microfoundations of macroeconomics beyond fallacious neoclassical microfoundations by focusing on embedded behaviors and on the in-depth analysis of the historical provisioning process.

(4) A model grounded in the social provisioning process would aptly deal with the issues such as how the social product and the social surplus is generated, how agents gain access to and engagement in the social provisioning process, and how social institutions including market institutions are organized and controlled so as to ensure the class interests, and the reproduction and stability of the capitalist system.

From the social provisioning perspective articulated here, we evaluated three selected heterodox models—the social fabric matrix, system dynamics, and the social surplus approach. One of findings is that the social fabric matrix and the social surplus approach have great potential to provide casual explanation of social reality since they are firmly grounded in the social provisioning process. System dynamics, however, contains some crucial problems that need to be resolved if it is to offer the causal

explanation of real historical changes over time.

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