ECOLOGICAL ECONOMICS 60 (2006) 324–332

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ANALYSIS

A sustainable perspective on the knowledge economy: A critique of Austrian and mainstream views☆

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ARTICLE INFO

Article history:
Received 18 November 2003
Received in revised form
8 January 2006
Accepted 25 January 2006
Available online 24 March 2006

Keywords:
The knowledge economy
The knowledge problem
Sustainable development
John Stuart Mill
The stationary state

ABSTRACT

This paper proposes that the current growth-oriented exposition of the knowledge economy in literature is not only monistic but also partial. The mainstream's persistent emphasis on knowledge and economic growth and its neglect of knowledge and other critical issues (such as promoting wealth equalities and environmental conservation) lead to a paucity in terms of the variety of knowledge in the global knowledge commons, which will not fulfill the goal of sustainable development. To maintain a sustainable society with an efficient use of resources, it is necessary to achieve a more equitable distribution of wealth. This type of question, however, continues to be ignored and remains unanswered in both the Austrian analysis of the knowledge problem and the mainstream exposition of the knowledge economy. In this regard, John Stuart Mill's concept of *the stationary state* is in line with contemporary analysis of a sustainable society and is worth further review.

1. Introduction

Investigations and discussions on the knowledge economy (or knowledge-based economy) have intensified (see, for example, Grossman and Helpman, 1991; Freeman and Polasky, 1992; Jones, 1995; OECD, 1996; Atkinson and Court, 1998; Aghion and Howitt, 1998) since the 1990s. The mainstream exposition of the knowledge economy, however, is epistemologically circumscribed. Knowledge is regarded as the central impetus to economic growth. Yet, one might ask a subsequent question. Do we need to develop a knowledge-based economy to solve serious problems (such as rising wealth inequalities and environmental degradation) and lead socioeconomic progress to a sustainable society? This type of critical issue, as usual, has been left unnoticed and unanswered in mainstream literature.

The present interpretation of the knowledge economy focuses on the significance of knowledge or human capital for economic growth.[1] Romer (1986, 1990) and Lucas (1988) initiated the recent wave of growth research in the mid-1980s. According to the new growth theory, the advance of knowledge is a crucial determinant of long-term economic growth. Indeed, as early as in the 1960s, Fritz Machlup, late president of the American Economic Association (AEA) and an eminent Austrian economist specializing in the subject of knowledge, has first analyzed

☆ The author would like to thank two anonymous referees and seminar participants at National Taiwan University, Academia Sinica and the First International Confederation of Associations for Pluralism in Economics (ICAPE) Conference held in Kansas City, Missouri, USA, June 5–7, 2003 for their helpful comments. Section 6 of this paper was in part supported by the Taiwan National Science Council (Grant No. NSC 91-2415-H-004-011).

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[1] In the economics literature, human capital and knowledge are frequently used interchangeably and broadly refer to people's acquired or innate abilities that are conductive to productivity and economic growth. For a detailed examination of human capital and knowledge, see Lin (in press) for example.

0921-8009/$ - see front matter © 2006 Elsevier B.V. All rights reserved.
doi:10.1016/j.ecolecon.2006.01.012

the "knowledge industries" in his pioneering book entitled *The Production and Distribution of Knowledge in the United States* (1962) and has found that the ratio of knowledge-production to adjusted GNP was almost 29% in 1958. Despite the fact that the share of knowledge production in GDP has been increasing over the past several decades for most countries,[2] our human societies have been concurrently characterized by serious phenomena such as rising income and wealth inequalities and the global community becoming less and less sustainable.

Clearly, the unifaceted exposition of the knowledge economy from the perspective of increased production and accumulation has been far from perfect. Since the Brundtland Report released in 1987, we have begun to inquire into the possibility of global *sustainability* from an overlapping-generations perspective. Fundamental to this new perspective is the recognition that human generations are interrelated and intergenerational issues such as equity, environmental externalities, allocation of (environmental) resources, and policies for social optimality ought to be critically addressed (see, for example, Howarth and Norgaard, 1990; Howarth, 1991; Babu et al., 1997; Farmer and Randall, 1997; Dasgupta, 1998; Ansuategi and Escapa, 2002; Farmer, 2005).

To develop a sustainable perspective on the knowledge economy, the remainder of this paper is organized as follows. Section 2 reviews the Austrian analysis of knowledge, which is considered the predecessor of the mainstream exposition of the knowledge economy. Section 3 examines the knowledge economy from the mainstream perspective. Section 4 provides a critique of the Austrian and mainstream views. Section 5 analyzes the evolution of knowledge and its impact on human development. Section 6 offers a glimpse of a new vision of the knowledge economy that helps develop John Stuart Mill's ideal and sustainable society. The final section provides a conclusion.

2. The Austrian analysis of knowledge

The present emphasis of the knowledge economy on the production, distribution and use of knowledge (and information) can trace its lineage directly back to Austrian economist Fritz Machlup's original research presented in *The Production and Distribution of Knowledge in the United States* (1962).[3] Later, Machlup published some other works including *Knowledge and Knowledge Production* (1980), *The Branches of Learning* (1982) and *The Economics of Information and Human Capital* (1984).[4] His unusual ideas have highlighted the significance of knowledge production for economic growth in modern economies and have stimulated subsequent research into the knowledge economy. For instance, 1979 Nobel laureate T.W. Schultz has applied Machlup's (1962) concepts of education into his important book entitled *The Economic Value of Education* (1963), which later became an underlying basis employed by his Chicago fellow Robert Lucas to develop the new growth theory in the 1980s.

Despite Machlup's influential study on the subject of knowledge, one can strongly perceive his strong Austrian inclination toward market-oriented knowledge (for economic growth) and his paucity of discussions such as policy-oriented knowledge (for reducing poverty). In this regard, one has to trace his insights from the Austrian literature. The knowledge issues, as seen in the tradition of the Austrian analysis, are a central element and can be traced far back to the early work of the founder of the Austrian School, Carl Menger, in his *Principles of Economics* published in 1871 (Baetjer, 2000). In the 1930s and 1940s, the so-called *knowledge problem* was formally introduced and analyzed by Hayek (see, for example, Kasper and Streit, 1998, chap. 3).

In his 1937 paper "Economics and Knowledge" and his 1945 paper "The Use of Knowledge in Society," Hayek attacked the traditional assumption of complete knowledge and stressed the nature of the economic problem as follows:

> But in our analysis, instead of showing what bits of information the different persons must possess in order to bring about that result, we fall in effect back on the assumption that everybody knows everything and so evade any real solution of the problem… It has become customary among economists to stress only the need of knowledge of prices, apparently because – as a consequence of the confusion between objective and subjective data – the complete knowledge of the objective facts was taken for granted. (Hayek, 1937, p. 49)

> The economic problem of society is thus not merely a problem of how to allocate "given" resources — if "given" is taken to mean given to a single mind which deliberately solves the problem set by these "data." It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge not given to anyone in its totality. (Hayek, 1945, pp. 519–20)

From the perspective of Hayek, the *best* use of knowledge in society is to ensure that heterogeneous individuals with distinct plans can promptly apply their limited or partial knowledge to cooperate and/or compete with each other in the market. To Hayek, competition means decentralized planning by heterogeneous individuals with limited knowledge (i.e., heterogeneous individuals who possess differential knowledge). Additionally, his notion of equilibrium, in this context, implies a specific situation in which all heterogeneous individuals' plans are synchronized. Finally, the interactions of all these heterogeneous individuals (best known as the market process or a *catallaxy*) can lead to the creation or discovery of new knowledge.

[2] According to the OECD report (1996), more than half of the GDP in the major OECD countries is now knowledge-based. Also, Rubin et al. (1986) provided updated US statistics presented in Machlup (1962) up to 1980.

[3] For the development of the ideas of the Austrian school, see Vaughn (1994) for example. Vaughn (1994, p. 36) has mentioned that Machlup's 1962 work "was an Austrian theme in a neoclassical setting."

[4] According to Machlup (1962, 1980), knowledge can be classified into the following five types: (1) practical knowledge, (2) intellectual knowledge, (3) small-talk and pastime knowledge, (4) spiritual knowledge, and (5) unwanted knowledge. In addition, he classified knowledge production into six major knowledge industries and branches: (1) education, (2) research and development (R&D), (3) artistic creation and communication, (4) media of communication, (5) information services, and (6) information machines.

In his 1974 Nobel Prize lecture, Hayek warned that economists pretended to know what was in practice not fully known or measurable, and they inevitably risked giving false advice. He said:

> To act on the belief that we possess the knowledge and the power which enable us to shape the processes of society entirely to our liking, knowledge which in fact we do *not* possess, is likely to make us do much harm. (from Hayek's (1974) Nobel Prize Lecture, The Pretence of Knowledge)

To Hayek, the market is instrumental and necessary for the realization of individual freedom, the solving of economic problems, and the gestation of new knowledge. The central planners and/or boards characterized by their limited knowledge cannot predict the final outcomes of individual actions in the unknown future. They cannot just issue authoritative orders to solve the economic problems existing in society.

To paraphrase Hayek, Austrian economists recognize that the lack of (perfect) knowledge or human ignorance is constitutional. In essence, the economic problem is concerned with how heterogeneous individuals with limited knowledge carry out their actions and execute their plans over time through exchanges with each other. The market is an institution for the coordination, exchange, and utilization of the differential knowledge of individuals. People learn by doing and acquire new knowledge through the competitive market process. Therefore, the competitive market process, from an Austrian perspective, has led to beneficial interaction among market participants. This process, over time, reduces ignorance to manageable levels for economic agents, promotes the discovery of knowledge that was not previously available, and could contribute to economic growth.

3. The knowledge economy: knowledge and economic growth

Although the Austrian school investigated the knowledge subject earlier and made a phenomenal contribution, it was a group of Chicago school economists, namely, T. W. Schultz, Gary Becker, and particularly Robert Lucas and Paul Romer,[5] who incorporated more direct knowledge (or human capital) in their theories and models and promoted the research domain of growth theory to the frontier. Romer (1986, 1990) and Lucas (1988) initiated the recent wave of growth research in the mid-1980s and were the primary developers of the new growth theory. According to the new growth theory, the advance of knowledge is a crucial determinant of long-term economic growth. Spillovers of knowledge (or human capital) across firms, for example, can help prevent the phenomenon of diminishing returns to the accumulation of capital.

Lucas (1988) considered the *external effects* of human capital built on the concept of human capital developed by Schultz (1963) and Becker (1964).[6] These effects are seen as spillovers from one person to another and to some extent contribute to the productivity of all factors of production. That is, human capital increases the productivity of both labor and physical capital. Lucas (1988, p. 19) emphasized that "human capital accumulation is a *social* activity, involving *groups* of people in a way that has no counterpart in the accumulation of physical capital."

This current interpretation of the knowledge economy and the development of the new growth theory have given rise to at least two interesting questions. First, in addition to receiving numerous significant awards, Romer was named one of America's 25 most influential people in 1997 by TIME magazine. Lucas was awarded the 1995 Nobel Prize for his rational expectations thesis. It was even predicted that he might be awarded a second Nobel Prize because of his influential 1988 paper "On the Mechanics of Economic Development."[7] Thus, one might be curious to learn whether the key elements of the new growth theory represent an intellectual breakthrough (from an epistemological perspective). A thoughtful investigation of this question inevitably leads to the emergence of the following question: does any relationship exist between the Austrian analysis of knowledge and new growth theory?

It has been widely recognized that Austrian economics is almost entirely focused on microeconomics.[8] Thus, in the first place one might be unaware of the nexus between the (micro) Austrian analysis of knowledge and the (macro) new growth theory. After further examination, one might find some evidence that the Austrian analysis of knowledge and the macro analysis of the new growth theory are unwittingly related to some extent. Baetjer (2000) has recently pointed out, from the Austrian perspective, that capital development is a social learning process and, consequently, growth rates can increase over time. The key concepts and findings such as "knowledge as the basic form of capital" (Romer, 1986, p. 1003), "endogenous technological change" (Romer, 1990) and "growth rates can be increasing over time" (Romer, 1986, p. 1002) are *de facto* in line with the Austrian analysis of knowledge. The difference between the Austrian analysis and the new growth theory only centers on their different views on "what factors slow these tendencies to increasing rates of growth" (Baetjer, 2000, p. 169).[9]

Thus, the present interpretation of the new growth theory that emphasizes the importance of knowledge to long-run growth can be viewed as the restructuring of the microfoundations of mainstream macroeconomics toward the Austrian school in a narrow and restrained sense. Put compactly, Romer (1986, 1990) and Lucas (1988) can best be regarded as

[5] Romer is currently teaching at Stanford University. He obtained his doctorate from the University of Chicago and has also taught at the University of Chicago.

[6] See Nerdrum (1999) for a detailed description of the development of the human capital theory.

[7] A more apt title of his paper might be "On the Mechanics of Economic Growth."

[8] Horwitz (2000) has recently offered an exposition of what Austrian macroeconomics would look like.

[9] In this regard, Baetjer (2000) criticizes new growth theorists for using some ad hoc assumptions to make their models tractable. From the Austrian perspective, the main challenge is how to maintain capital complementarities in an environment of incomplete and vastly changing knowledge.

pioneers in constructing *mathematical models* of knowledge. Their concepts and ideas are *absolutely* not novel if one takes a close review of the Austrian literature. To see further, note that the following statements of strong Austrian flavor were actually made by Romer (1994) in his concluding remarks.

> We will be able to address the most important policy questions about growth: In a developing country like the Philippines, what are the best institutional arrangements for gaining access to the knowledge that already exists in the rest of the world? In a country like the United States, what are the best institutional arrangements for encouraging the production and use of new knowledge? (Romer, 1994, p. 21)

It would appear, then, that the Austrian analysis of the knowledge problem and the mainstream exposition of the knowledge economy are analytically compatible and sequentially connected. Austrians criticize the neoclassical assumption of given knowledge and emphasize the constitutional ignorance of human existence. However, one might initiate appropriate institutional arrangements such as educational reform to ease human ignorance and facilitate the accumulation of knowledge. Over time, the accumulation of knowledge leads to long-term economic growth. Therefore, the Austrian analyses of the knowledge problem and the knowledge industries are, in effect, the predecessor of the mainstream exposition of the knowledge economy.

4. A critique of Austrian and mainstream views

Yet the Austrian analysis of the market-oriented knowledge is far from perfect and one might simply present the Austrians with two basic questions. First, it is not a problem to admit that people are to some extent ignorant. However, why do people possess differential knowledge? In other words, why does the Austrian school regard individuals with differential knowledge as given in their analysis? It is clear that the Austrian analysis methodologically rationalizes the existing *heterogeneous* knowledge structure of the capitalist system. It is, however, not difficult to imagine that the profits or losses from market activities and, accordingly, the distribution of income and wealth of the society are closely related to the differential knowledge of economic agents. Since differential knowledge is a key element in deciding market winners or losers, the study of the formation of the knowledge structure for market participants becomes vital. The Austrian analysis, however, merely takes the existing *heterogeneous* knowledge structure of society for granted without further examination of its causes and far-reaching consequences. Not surprisingly, the discovery and production of knowledge are greatly extolled but the co-existent phenomena such as rising income and wealth inequalities have been reduced to triviality in the Austrian analysis.

Second, why does the implementation of a free market (institutions) only cater to all the interests of differential people and communities? The choice of a free market along with its institutions, indeed, is merely an option. The paramount propaganda of the free market structure unleashed by the Austrians remains dubious.[10] Differential people and communities should have wide latitude in choosing and building economic institutions catering to their specific interests such as pursuing economic equality for social justice or developing a self-reliant type of economy with limited external trade, and so on. The concept of economic freedom should be expanded to not only include the concept of free market competition but also to incorporate the choice of other economic institutions created for satisfying different groups of people.

The limitations imposed by the mainstream's narrow analysis of the knowledge economy are also evident. Knowledge is largely regarded as the central impetus to economic growth. Yet one might ask the following question: can knowledge be regarded as the central element for promoting socioeconomic progress such as creating a sustainable society? As soon as this type of question is asked, some critical issues emerge. For example, a stylized fact on earth is that many poor people relentlessly die of hunger or disease every day. From a global perspective, we have produced enough to feed all the people on earth. The pressing issue, indeed, is not to produce more but to seek a *knowledgeable* allocation and distribution to alleviate poverty.

Moreover, the mainstream underlying emphasis on the *competitiveness* of a single person or country is very shortsighted, which will not fulfill the goal of long-term development of humans. From a global village perspective, we can intuitively consider that there exists only *one* human society on earth. It can be fairly understood that our human society will not develop for very long if competition exists between different generations. As older generations control the society, they will not allocate enough resources to younger generations to enhance their *competitiveness*. Younger generations, as a result, will become *weaker* over time and the society as a whole will eventually *come to an end*.[11] Thus, the concept of competition (or competitiveness) is de facto not compatible with the nature of the long-term development of human societies.

5. The evolution of knowledge: knowledge and human development

Human life is collective, cumulative, and evolutionary in character. It is reasonable to state that an ordinary individual living in the twenty-first century may not be any more intelligent than a person living in the first century. Many well-known facts can immediately justify this statement. Just take the phenomenal Egyptian pyramids for example. So far,

[10] In Hunt's (1992, pp. 572–584) analysis of the Austrian and Chicago schools, he has pointed out that these two schools purport to be a value-free science and claim that their theory fits for all people at all times. In contrast, heterodox economics such as ecological economics is built on a value-commitment to study ecology and economics (Söderbaum, 1999).

[11] To *escape* competition, the best strategy for older generations is the decision to use all the society's resources and not have any offspring generations. Obviously, this scenario has not occurred in human history yet.

modern scientists have not figured out exactly how they were built. However, we realize that the average person lives better and longer nowadays. Why? The truth is that knowledge has accumulated over time and spread from generation to generation. That is, the knowledge fund has grown and modern people have consequently been endowed with greater intellectual capacity and capital. To better understand this point, we might hypothetically imagine the existence of *a knowledge barn* (or *commons*) for human society from an overlapping-generations perspective. In primitive and ancient times, the knowledge barn only accommodated a small quantity of knowledge. When our human ancestors went into the knowledge barn, they found few pieces of knowledge available for use. As time went on, more pieces of knowledge were piled up in the barn as each human generation made its marginal contribution to the accumulation and spread of knowledge. Thus, the existing generations have to recognize that they are very fortunate. Knowledge has accumulated and spread across the world generation by generation. This long-term process of gestation to some extent benefits *all* of us.

Let us consider a very basic (but important) piece of knowledge. That is, one plus one equals two (1+1=2). In relation to this *simple* piece of knowledge, the various kinds of symbols (1, 2, +, =) and the addition rule were previously designed and created by our human ancestors. This piece of knowledge is their legacy and is collectively inherited by all of us. We can easily understand that accountants could not do bookkeeping without it. Without it, Bill Gates' programmers would not be able to write computer programs and help Bill Gates establish his Microsoft empire. In fact, astronauts would not have landed on the moon without this piece of knowledge. As a matter of fact, a *pure* inventor or creator does not exist in an intellectual sense.

It is also known that R&D activities are central to the generation of new knowledge. R&D activities are dispersed across individual workrooms, private profit and nonprofit organizations, academic institutions, and governmental agencies. If one wants to measure, for example, the total cost of R&D activities, one has to take the monetary and non-monetary outlays of the parties involved into account. Thus, it can be expected that the costs to society as a whole will be extraordinarily high at first. The benefits that society can derive from the enormous amounts of money, time, and effort expended on R&D activities are normally low in the initial stages,[12] but are expected to increase over the long run. This phenomenon is particularly significant for basic research.

The aforementioned arguments indicate that, from a long-term perspective, knowledge accumulates and spreads from generation to generation over time. Each human generation enjoys the benefits of knowledge transmitted from the preceding human generations and, consequently, passes the stacked benefits (i.e., the preceding benefits plus the marginal benefits created by the existing generation) to the immediate subsequent generation. In this respect, one might be aware that knowledge is a special type of international public good. A pure international public good, in principle, can generate benefits that spill over borders, regions, ethnic groups, and generations.[13] Although each human generation is mortal, its knowledge exists and continues to expand in human society. That is, the collective knowledge is still living and is vital to the long-term development of humans.

6. A sustainable perspective on the knowledge economy

Now it is time to seriously reconsider the knowledge issue from the perspective of our position in human history. Kenneth E. Boulding, a pioneer in the field of ecological economics and a late president of the AEA, describes the epistemological problem as follows:

> There are, of course, a number of epistemological questions, some of which lie more in the province of the philosopher than they do the economist or the social scientist. The one with which I am particularly concerned here is that of the role of knowledge in social systems, both as a product of the past and as a determinant of the future. (Boulding, 1966, p. 1)

What is the role of knowledge in human development? Knowledge, as previously illustrated, is not only critical to economic growth but also to our society's long-term development. So, what does a sustainable society look like? In this respect, John Stuart Mill's (1965) concept of *the stationary state* is in line with contemporary analysis of a sustainable society and is worth further review.

Daly (1973, 1977, 2005) traces his exposition of a sustainable economy, steady-state economy (SSE), back to Mill's notion of *the stationary state*. The SSE is a *physical* concept which refers to an economy whose scale (i.e., resource throughput, equal to population times per capita resource use) remains at a constant level. This level neither depletes the materials from the environment beyond its regenerative capacity nor pollutes the environment beyond its absorptive capacity.[14] O'Connor (1997) investigates Mill's concepts of a private property-based liberal society as well as a stationary-state society and argues that the writings of Mill represent a prototype for ideals of a "sustainable development." Winch (2004, p. 111) points out that Mill is one of the earliest green thinkers and his "defense of a zero-growth society conveys the substance of his environmentalist concerns." Mill's virtuous stationary-state (zero-growth) society, according to Winch (2004, p. 122), is "a continuous state of dynamic equilibrium" in which all improvements in new technologies can be redirected towards redistribution of wealth and the promotion of life quality.

[12] This is the main reason why private firms (even for big enterprises) normally show no interest in investing in basic R&D activities. Undoubtedly, the government has to assume a positive role to promote these activities.

[13] The significance of international (or global) public goods has recently given rise to intense analyses (see, for example, Kaul et al., 1999; Ferroni and Mody, 2002).

[14] It might be noted here that Daly's concept of SSE has not been void of practice. Indeed, most indigenous tribes organized as a closed group with a common property have practiced SSE for (tens of) thousands of years on earth.

Lin (2003) has further argued that the rich communities (nations) have tended to waste resources, whereas the poor communities (nations) have tended to destroy resources. Due to rising wealth inequalities all over the world and limited resources on earth, the global community has become less and less sustainable. To maintain a sustainable society with an efficient use of resources, it is necessary to achieve a more equitable distribution of wealth. In this regard, Lin (2003) has restated that Mill's concept of *the stationary state* is conceptually consistent with the modern exposition of sustainable development.

Although greatly influenced by David Ricardo, Mill's *stationary state* was not the dismal scenario which David Ricardo visualized. Mill took a different view of his desirable society and outlined his desires for a good future. In his chapter on *the stationary state*, in which he discussed the long-run tendencies of the economy, he said:

> But the best state for human nature is that in which, while no one is poor, no one desires to be richer, nor has any reason to fear being thrust back by the efforts of others to push themselves forward. …There would be as much scope as ever for all kinds of mental culture, and moral and social progress; as much room for improving the Art of Living, and much more likelihood of it being improved, when minds ceased to be engrossed by the art of getting on. (see Mill's *Principles of Political Economy*, pp. 748–51)

Looking at the economic and social conditions of his time, Mill felt that the mass of society was bypassed by the materialistic development of the Industrial Revolution and wondered whether a country with a growing economy was a desirable living place. He envisioned that *the stationary state* would result in an improvement in the art of living. For example, here is a brief excerpt of his writing:

> It is only in the backward countries of the world that increased production is still an important object: in those most advanced, what is economically needed is a better distribution. …On the other hand, we may suppose this better distribution of property attained, by the joint effect of the prudence and frugality of individuals, and of a system of legislation favouring equality of fortunes, so far as is consistent with the just claim of the individual to the fruits, whether great or small, of his or her own industry. (see Mill's *Principles of Political Economy*, p. 749)

Therefore, Mill's *stationary state* might be narrowly interpreted as a society with *no (or limited) growth in physical output*. Alternatively, it should be best understood as a society with unlimited growth in mental culture and improvements in economic equality (by means of wealth redistribution). In this regard, Mill's concept of *the stationary state* is in line with contemporary analysis of a sustainable society and is very close to the *ethical–utopian* perspective on sustainable development. According to Bergh (1996, p. 59), the ethical–utopian perspective emphasizes "new individual value systems and new social objectives; …long-run policy based on changing values and encouraging citizens (altruistic) behavior as opposed to individual (egoistic) behavior."

Surely, the transition from a growth-oriented economy toward Mill's *stationary state*, a final stage of civilization, will not be an easy task. In the middle of the 19th century, Mill's vision was far, far ahead of his time. Eighty-two years later, Mill's sanity was echoed by his great fellow British economist John Maynard Keynes. It seemed untimely, as the Great Depression has been under way, that Keynes envisaged the future of our economic progress in his short essay, *Economic Possibilities for Our Grandchildren*.[15] In 1930, looking into the future, Keynes discerned the following state of affairs.

> There are changes in other spheres too which we must expect to come. When the accumulation of wealth is no longer of high social importance, there will be great changes in the code of morals… Of course there will still be many people with intense, unsatisfied purposiveness who will blindly pursue wealth — unless they can find some plausible substitute. But the rest of us will on longer be under any obligation to applaud and encourage them. (see Keynes' *Essays in Persuasion*, pp. 369–370)

Keynes concluded that the time for our destiny of economic bliss has not come yet. It is because "avarice and usury and precaution must be our gods for a little longer still" (Keynes, 1963, p. 372). He, however, encouraged mankind to change gradually and to make preparations for our destiny.

Nevertheless, the rich have rarely been *content with being rich* in the 75 years since the publication of Keynes' *Economic Possibilities for Our Grandchildren* and in the 157 years since the publication of Mill's *Principles of Political Economy*. Locally and globally, our human societies have been continuously characterized by the scenario of pursuing a growing economy but accompanied with rising inequality of fortunes. This phenomenon can be attributed to our asymmetric knowledge regarding the rich (communities) and the poor (communities). As Boulding notes on this point:

> One area where economists have a good deal to be humble about is in the field of economic development of the poor countries. In the rich countries we have done fairly well; in the poor countries our record is distinctly spotty. (Boulding, 1966, p. 11)

Clearly, economists need to develop substantial knowledge towards the poor to resolve the poverty problem. Poverty is frequently entangled with the phenomena such as contagious diseases and criminal activities, which cause great negative impact on other individuals and communities. Reducing poverty is essential for achieving a sustainable community if poverty reduction induces greater public health and security. From a global village perspective, the reduction of poverty has become even more significant if it contributes to disease eradication and global peace, both of which are crucial for global sustainability.

As the result of a long past, we now come to inquire into the possibility of a sustainable society. Do there exist any possibilities of developing Mill's high-minded mental culture

[15] This essay was collected in Keynes' (1963) work *Essays in Persuasion*.

and a sustainable future? In the first place, we had better rid ourselves of growth-mania and develop a pluralistic perspective on the knowledge economy. This is a formidable task and requires ideological abandonment of the dominant emphasis on economic growth.[16] The current growth-oriented exposition of the knowledge economy in mainstream literature is not only monistic but also partial, which will not fulfill the goal of sustainable development. To achieve this goal, Harris (2000) has suggested that it is necessary to develop new and more democratized avenues to the formulation of values, beliefs, and knowledge. Fortunately, people have nowadays become more and more knowledgeable. For instance, they have become more knowledgeable about the importance of protecting the natural environment and the disadvantages of over consumption.[17] As a result, many people worldwide have taken steps to protect the natural environment and change their consumption patterns toward green consumption.[18] These progressive institutional changes might greatly encourage more and more people to live a simpler life, subsequently lead to a reduction in economic growth, and eventually shift the society onto the *right* track of a sustainable economy.

In his book, *Development Betrayed: the End of Progress and a Coevolutionary Revisioning of the Future*, Norgaard (1994, p. 62) identifies "atomism, mechanism, universalism, objectivism, and monism" as the dominant philosophical roots of Western modernism and development has been betrayed by each of these tenets. The prevalence of the aforementioned philosophical premises has caused the exclusion of other metaphysical and epistemological premises which are better for comprehending the degradation of environmental systems and which are more conducive to cultural diversity. Norgaard (1994, p. 73) argues forcefully, for instance, that, by publicly agreeing to monism, we not only give up public basis for using the knowledge of other cultures but also arbitrarily throw out answers which might be just as good and reliable.

Specifically speaking, the global village on earth is composed of numerous (but finite) knowledge economies. The scope or dimension of each economy can range from a small community of a country (such as the Onge people of India) to a regional integration of many countries (such as the European Union countries).[19] To expand the global knowledge commons, we have to fully acknowledge and protect the characteristics of each unique knowledge system (such as indigenous knowledge possessed by a small tribe) and then help each individual knowledge commons develop into a specific set of economic institutions that interact with each other in a global environment. That is, each individual knowledge economy is best developed based upon its distinct characteristics from others. Once knowledge prevails in a global society,[20] each community (whether a small tribe or a regional integration) can improve its own development by absorbing knowledge from the global commons. Additionally, it can expand the global commons by injecting knowledge into it. Gradually, this process will contribute to the emergence of new economic institutions compatible with the long-term development goals of each individual community (such as developing a self-reliant economy with limited external trade or pursuing economic equality for social justice) and lead to the state of sustainable development in a global environment.

7. Conclusion

This paper has shown that the unifaceted exposition of the knowledge economy from the perspective of increased production and accumulation has been far from perfect and cannot fulfill our goal of a sustainable future. Both the Austrian analysis of the knowledge problem and the mainstream exposition of the knowledge economy have been grounded on the concept of (free market) competition and purported to be value-free. This paper emphasizes that the conventional concept of competition is not compatible with the nature of the long-term development of human societies and proposes that the concept of economic freedom should be expanded to incorporate the choice of other economic institutions (more than free market institutions) created for satisfying different groups of people.

Global sustainability is a de facto shared responsibility from an overlapping-generations perspective. Fundamental to this holistic perspective is the recognition that human generations are interrelated and ought to be examined as an integrated whole. Based upon this understanding, each generation should not only care about their welfare but should

[16] See, for example, Daly (1996) for a discussion about the conflict between long-term economic growth and the carrying capacity of the environment.

[17] The negative impact of over consumption on the environment has long been recognized by environmentalists (see, for example, Jacobs, 1997). The mainstream literature has recently begun to explore this issue (Arrow et al., 2004).

[18] For those activities, check the "World Earth Day" (http://www.earthday.net) and the "International Buy Nothing Day" (http://www.ecoplan.org/ibnd/ib_index.htm) movements for example.

[19] The Onge people (with a population of less than 100) live in the Indian Litte Andaman Island in the Bay of Bengal. They possess indigenous knowledge encompassing medicine, biology, and nature (Norchi, 2000). Indigenous knowledge usually refers to unwritten knowledge preserved locally in oral traditions and has been increasingly recognized as critical for sustainable development (see, for example, Brokensha et al., 1980; Fernando, 2003).

[20] Such a development is challenging and requires actions with deliberation. Consider the following two issues for example. First, we are actually losing indigenous knowledge as indigenous people have gradually lost their cultural identities all over the world. It is very urgent to conduct research on how people can preserve the natural environment of the indigenous people (as indigenous knowledge and their natural habitats go hand in hand). Second, the existing intellectual property rights (IPRs) system has remained controversial and becomes dominant in controlling access to knowledge, the spread of knowledge, and also the trading of knowledge-related goods and services. Whether the existing IPRs can be applied or extended to cover indigenous knowledge also requires in-depth research. Proponents of IPRs, on the one hand, believe that the current system cannot only protect the process of invention and innovation but can also provide economic incentives for creative activities. Opponents, on the other hand, generally hold the view that the protection of IPRs has been implemented at the expense of the public knowledge domain and has prevented the full dissemination of knowledge.

also strive for a sustainable future. One can observe the phenomenon that the global community has become less and less sustainable due to rising wealth inequalities and environmental degradation. To maintain a sustainable society with an efficient use of resources, it is necessary to achieve a more equitable distribution of wealth. In this regard, this paper has expounded that the notion of sustainable development has in its roots John Stuart Mill's *stationary state*, a value-driven vision of a good future. Mill's *stationary state* is an ideal society with an emphasis on unlimited growth in mental culture and improvements in economic equality (by means of wealth redistribution), which is in line with contemporary analysis of a sustainable society.

From a global village perspective, our earth is composed of numerous knowledge economies. To develop a pluralistic perspective on the knowledge economy, each individual knowledge economy is best developed based upon its distinct characteristics from others. As long as we can help each individual knowledge system develop into a specific set of economic institutions that reciprocally interact with each other in a global environment, we will be able to develop new values, beliefs, and knowledge compatible with the goal of global sustainability.

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