



PROMOTING LEADERSHIP OF THOUGHT  
THAT LEADS TO ACTION

*THE WEALTH OF NATIONS REVISITED*

# CADMUS

A papers series of the South-East European Division  
of the World Academy of Art and Science (SEED-WAAS)

Volume I, Issue 1

October 2010

## Editorials

Introductory Paper for a Programme on The Wealth  
of Nations Revisited

*Orio Giarini, Garry Jacobs, Bernard Lietaer, Ivo Šlaus*

The Knowledge Society: A Sustainability Paradigm

*Naim Hamdija Afgan and Maria G. Carvalho*

Theory and Strategies for Full Employment

*Ashok Natarajan*

Human Rights and Employment

*Winston P. Nagan*

Indicators of Economics Progress: The Power of  
Measurement and Human Welfare

*Garry Jacobs and Ivo Šlaus*

## DOCUMENTS

Transforming Finance Group's Call Recognizes  
Finance as a Global Commons

*Ethical Markets, Hazel Henderson*

The World Academy of Art and Science: History and  
Manifesto

## EDITORIAL BOARD

---

**Chairman:** Ivo Šlaus, Member of the Board of Trustees of the World Academy of Art and Science, and President, South East European Division, World Academy of Art and Science, Zagreb, Croatia.

**Editor-in-Chief:** Orio Giarini, Director of The Risk Institute (Geneva and Trieste, Publisher).

**Managing Editor:** Garry Jacobs, Member of the Board of Trustees of the World Academy of Art and Science and Vice-President, The Mother's Service Society, Pondicherry, India.

**Members:** Walter Truett Anderson, Nese Kavak, Winston Nagan.

### *The CADMUS Journal*

*The acronym of the South-East European Division of The World Academy of Art and Science – SEED – prompted us to initiate a journal devoted to seed ideas - to leadership in thought that leads to action. We put this sentence as a motto, but we realize that we need a name for the journal. For our website it was easy to decide on [www.seed-ideas.org](http://www.seed-ideas.org), but name of a journal is more demanding. Several suggestions were made: Mercator (Gerard Mercator born as Gerard de Cremer in 1512 in Rupelmondanus - a Dutch mathematician, astronomer, and best known as a cartographer, professor at University of Leuven, He signed his work with Gerardus Mercator Rupelmondanus. Indeed, we are trying to provide maps) and, following the example of Daedalus, used by the American Academy of Arts and Sciences for its journal, Cadmus. Cadmus (or Kadmos in Greek and Phoenician mythology) was a son of King Agenor and Queen Telephassa of Tyre, and brother of Cilix, Phoenix and Europa. Cadmus is credited with introducing the original alphabet – the Phoenician alphabet, with “the invention” of agriculture, and with founding the city of Thebes. His marriage with Harmonia represents the symbolic coupling of Eastern learning and Western love of beauty. The youngest son of Cadmus and Harmonia is Illyrius. The city of Zagreb, which is the formal seat of SEED, was once a part of Illyria, a region including what is today referred to as the Western Balkans and even more.*

*Cadmus will be a journal for fresh thinking and new perspectives that integrate knowledge from all fields of science, art and humanities to address real-life issues, inform policy and decision-making, and enhance our collective response to the challenges and opportunities facing the world today.*

### **Copyright:**

The Risk Institute - Istituto del Rischio

Via della Torretta, 10 - 34121 Trieste - Italy / 53 route de Florissant - 1208 Geneva - Switzerland

South-east European Division of the World Academy of Art and Science (SEED-WAAS), Zagreb

*This CADMUS issue is a complement to the European Papers on the New Welfare n. 15, ISSN 19708947*

### **Sites:**

[www.seed-ideas.org](http://www.seed-ideas.org) - [www.newwelfare.org](http://www.newwelfare.org)

### **E-mail:**

[editor@cadmusjournal.org](mailto:editor@cadmusjournal.org)

### **Printed by:**

Tipografia Triestina snc - Via Valdirivo, 30/A - 34132 Trieste - E-mail: [info@tipografiatriestina.it](mailto:info@tipografiatriestina.it)



PROMOTING LEADERSHIP OF THOUGHT  
THAT LEADS TO ACTION

*THE WEALTH OF NATIONS REVISITED*

# **CADMUS**

**A papers series of the South-East European Division  
of the World Academy of Art and Science (SEED-WAAS)**

**Volume I, Issue 1**

**October 2010**

*Published by*  
**THE RISK INSTITUTE**  
GENEVA - PONDICHERRY - TRIESTE - ZAGREB

## OUR VISION

*The world is in need of guiding ideas, a vision, to more effectively direct our intellectual, moral and scientific capabilities for world peace, global security, human dignity and social justice. Today we face myriad challenges. Unprecedented material and technological achievements co-exist with unconscionable and in some cases increasing poverty, inequality and injustice. Advances in science have unleashed remarkable powers, yet these very powers as presently wielded threaten to undermine the very future of our planet. Rapidly rising expectations have increased frustrations and tensions that threaten the fabric of global society. Prosperity itself has become a source of instability and destruction when wantonly pursued without organizational safeguards for our collective well-being. No longer able to afford the luxury of competition and strife based primarily on national, ethnic or religious interests and prejudices, we need urgently to acquire the knowledge and fashion the institutions required for free, fair and effective global governance.*

*In recent centuries the world has been propelled by the battle cry of revolutionary ideas — freedom, equality, fraternity, universal education, workers of the world unite. Past revolutions have always brought vast upheaval and destruction in their wake, tumultuous and violent change that has torn societies asunder and precipitated devastating wars. Today the world needs evolutionary ideas that can spur our collective progress without the wake of destructive violence that threatens to undermine the huge but fragile political, social, financial and ecological infrastructures on which we depend and strive to build a better world.*

*Until recently, history has recorded the acts of creative individual thinkers and dynamic leaders who altered the path of human progress and left a lasting mark on society. Over the past half century, the role of pioneering individuals is increasingly being replaced by that of new and progressive organizations, including the international organizations of the UN system and NGOs such as the Club of Rome, Pugwash and the International Physicians for the Prevention of Nuclear War. These organizations stand out because they are inspired by high values and committed to the achievement of practical, but far-reaching goals. This was, no doubt, the intention of the founders of the World Academy of Art & Science when it established this institution in 1960 as a transnational association to explore the major concerns of humanity in a non-governmental context.*

*The founders of WAAS were motivated by a deep emotional commitment and sense of responsibility to work for the betterment of all humankind. Their overriding conviction was on the need for a united global effort to control the forces of science and technology and govern the peaceful evolution of human society. Inhibiting conditions limited their ability to translate these powerful motives into action, but they still retain their original power for realization. Today circumstances are more conducive, the international environment is more developed. No single organization can by itself harness the motive force needed to change the world, but a group of like-minded organizations founded with such powerful intentions can become a magnet and focal point to project creative ideas that possess the inherent dynamism for self-fulfillment.*

*The Editorial Board*

Editorials	4
Introductory Paper for a Programme on The Wealth of Nations Revisited <i>Orio Giarini, Garry Jacobs, Bernard Lietaer, Ivo Šlaus</i>	9
The Knowledge Society: A Sustainability Paradigm <i>Naim Hamdija Afgan and Maria G. Carvalho</i>	28
Theory and Strategies for Full Employment <i>Ashok Natarajan</i>	42
Human Rights and Employment <i>Winston P. Nagan</i>	49
Indicators of Economics Progress: The Power of Measurement and Human Welfare <i>Garry Jacobs and Ivo Šlaus</i>	53
<i>DOCUMENTS</i>	114
Transforming Finance Group's Call Recognizes Finance as a Global Commons <i>Ethical Markets, Hazel Henderson</i>	114
The World Academy of Art and Science: History and Manifesto	119
<i>EDITOR</i>	121

## Editorials

### **A Project on The Wealth of Nations Revisited, on the occasion of the 50th Birthday of the World Academy of Art and Science**

*“Leadership in thought that leads to action” is the phrase Harlan Cleveland, President of the Academy from 1991 to 2000, adopted to characterize the mission of the Academy. We — and the world — need it now, more than ever.*

*We need innovative and truly fresh ideas, ideas that can open up new directions in the evolution of Earth and humanity. We need ideas that will enable us to better understand our own cultures within a global context, ideas that will inspire and motivate people and lead us to concrete actions. The changes that we need are much more profound than any revolution of the past. Our world is for the first time truly global — its people, societies, economies and ecosystems interlinked as never before, as Walt Anderson, Academy President from 2000 to 2008 so aptly brought out in his 2001 book All Connected Now: Life in the First Global Civilization. This was also the view that united the founders of the Academy, one of the first globally-oriented nongovernmental organizations to emerge in the post-World War II years: among the list of the 40 charter members are the names of five Nobel laureates, a co-founder of UNESCO, and the first directors-general of the Food and Agriculture Organization (FAO) and the World Health Organization (WHO).*

*Their achievements say something about the commitments of the founders of the Academy, the emerging global consciousness that they anticipated. The globalization process is still underway and accelerating, altering the conditions of all our lives. In today’s hyperconnected world we are faced with new opportunities for cooperation and also new pressures that sometimes lead to violent conflict. These are the two faces of the global information society, in which more people possess knowledge and skills than ever before and are faced with a greater array of choices and challenges than people have ever confronted before: intertwined economic, ecological, social, political and moral opportunities and crises superimposed on soaring human aspirations and energy demands, climate change and demographic transition. In recognition of the need for new thought to support more effective action, the Academy’s founders set out to “explore the social consequences and policy implications of knowledge” — to advance the astonishing innovative capacities of technology and science, and simultaneously to assess the dangers and inequities that new knowledge so often brings.*

*These large-scale visions and concerns were central to the first work undertaken by the new Academy in the 1960s, and they continue to be addressed in its recent General Assemblies — The Governance of Diversity (1994), The Global Century (1998), The Future of Knowledge (2005), and The Anthropocene Challenge (2008) — and in many articles and books by Fellows of the Academy; and also in special editions of journals such as Futures, Peace and Policy, and The Annals of the New York Academy of Sciences.*

*Four decades ago in a report to the Club of Rome, Limits to Growth projected a startling*

*perspective that challenged conventional thinking and compelled the whole world to reevaluate both our thought and our actions. Controversial at the time of its initial publication, it still provokes lively and sometimes heated debate about fundamental issues of global development and the methodology of systems-dynamics research. Lofty goals and calls for action will remain unfulfilled unless the concepts on which the world is presently based change as well. The ideas we need to address today's challenges must transcend limited, partial perspectives, so often the source of disastrous consequences for the ascending progression of knowledge seeks to ever more fully reconcile, integrate and unify apparently divergent perspectives.*

*We are faced now with intertwined economic, ecological, social, political and moral crises superimposed on increasing energy demands, climate change and demographic transition. Simultaneously any form of war, violence, even armaments, is a threat to humanity. Though we know more and we are more capable than ever, our world is more vulnerable than ever, and the rapid changes we generate form impressions of uncertainties, often more frightening than real uncertainties. We do, indeed, live on a planet with limited natural resources. However, our ideas and our imagination are limitless. Knowledge is an inexhaustible resource. There is no limit to learning, and no limit to our creativity. The Industrial Revolution was based on the efficacy of money and machines. For two centuries financial capital was deemed the most essential ingredient for human progress. In recent decades, the growing awareness of the unlimited potential for human resourcefulness has compelled us to evolve a wider concept of both resources and development focusing centrally on their social and human dimensions. Changes in thought have led to changes in action.*

*Though we are children of this Earth, we may not be able to survive unless we travel and colonize even more than our Solar system, as S. Hawking emphasized. We do need much more energy and solar power plants positioned in space for terrestrial electricity could be the first step. Curiosity, imagination and creativity are basic features characterizing our evolution. The last two centuries were extremely rich, bursting, exploding with profound paradigmatic ideas always generating technological, economic and social changes. The names of Faraday and Maxwell, Planck, Einstein, Curie, Bohr, Schrödinger, Heisenberg and Dirac, of Darwin, Mendel, Watson and Crick, of Freud, Adler and Jung, of von Neumann, Pauling, Tesla, Fermi, Oppenheimer, Turing and Venter mark scientific and technological revolutions initiating nuclear and synthetic biology eras, ICT and brain-cognitive research. It is as if all scientific disciplines are bubbling with ideas and the gap between humanity and sciences discussed by C.P. Snow could be overcome by consilience as emphasized by E. Wilson. Even more profoundly, business, governance and scientific research meaningfully merge and unite in this common endeavor of generating leadership in thought leading to effective action and giving, as so brilliantly demonstrated by successful billionaires as B. Gates, W. Buffet and many others who continuously give, and by G. Soros' Open Society.*

*We need imaginative new work in every field of science, the humanities, and the arts. We also need work that transcends all limited perspectives, that is not only interdisciplinary but transdisciplinary, that harmonizes intellectual integrity with social responsibility. Only then can it effectively address the 21<sup>st</sup> century's challenges. This need for fresh perspectives is illustrated by a paper in this volume on "The Wealth of Nations Revisited," which calls for the integration of economic, political, social and psychological thought regarding human*

welfare and well-being. This process of unification needs to encompass not only physical fact and scientific principle, but also to be in harmony with the highest values and greatest good for humanity.

*The world is aswarm with ideas that warn us of perils on all sides. Negative commandments are powerful in highlighting the dangers and compelling us to address our problems, but they often conceal undreamt, revolutionary opportunities, as the perceived dangers of the Cold War concealed the unimaginable vistas of the Internet. What the world most needs today are positively creative ideas that will enable us to fashion a better future — ideas such as the visionary dream of European unity which has transformed a continent plagued by centuries of rivalry and warfare into a place where war between states has become unthinkable.*

*The Academy was founded 50 years ago as a fellowship of engaged artists, scientists, scholars, and leaders in public and private organizations. As we mark this anniversary, the South-East European Division has decided to commemorate the occasion by launching a journal under the motto “Leadership in Thought that Leads to Action”. Many ideas are required, from as many as possible. We initiate this endeavor on the subject of Wealth and Welfare, published in collaboration with European Papers on the New Welfare, established by and now led for over five years by Orio Giarini, Fellow of WAAS, Director of the Risk Institute, and Member of the Club of Rome.*

*The journal will be published annually/biannually in print and electronic form with the opportunity for active discussion afforded by websites of the SEED, WAAS and the journal’s own dedicated site [www.seed-ideas.org](http://www.seed-ideas.org). Articles will be published in English. Websites will be in English and in the language of the location of the website, thereby increasing the opportunities for reader and contributor participation.*

*We invite you to join us in this endeavor and to contribute to our coming issues.*

For the South Eastern Europe Division (SEED), World Academy of Art & Science:

Ivo Šlaus, Chairman of Cadmus

Garry Jacobs, Managing Editor



# Updating Macro-Economics

*Adam Smith's analysis in the Wealth of Nations gave birth at the end of the eighteenth century to economics as we know it today. As a moral philosopher, he wanted to provide a better understanding of how to fight poverty. While most social thinkers insisted that wealth could only develop from agriculture, Smith observed that the beginning of the industrialisation process was the key and priority to promote the Wealth of Nations for the future. And he was right.*

*Let me propose here first some non-conventional considerations to promote the Wealth of Nations in the future, reconsidering some key economic issues:*

- Economics did not start as a general social discipline concerning wealth, but as a consequence of the industrial revolution. An important historical event, it had a glorious development for over two centuries, but essential conditions and connotations began to change a few decades ago. Contemporary economics is very different than the economics of the Industrial Revolution. We live now in a Service Economy.*
- This implies that the economic theories and analysis based upon the classical industrial framework needs a serious, fundamental reappraisal. Many economists have long agreed that macroeconomics in particular is in a crisis. In addition, there are no clear economic explanations why after 1973, the rate of growth in GNP terms, in the "industrialized countries", has declined from an average of 6% or more to 2% or less. What are really the causes for the recent crises? There are many explanations, but they are only partially convincing.*
- We propose that some basic reference issues need to be reconsidered: What is economic value and how is it produced today? What is productivity and how is it measured? Do the main indicators that are used today still reflect the reference to the industrialized manufacturing system? We still calculate value-added on the basis of the remuneration of production factors (cost of machines and labor for an automobile) and productivity measures (the possibility to produce two cars instead of one in the same time period), but all this is less and less relevant.*
- Classical theory divided all economic activity into three sectors (agricultural, industrial-manufacturing, services). But today services (as a consequence of technological development) have become the main production factor in ALL activities, accounting in total for 70 to 80% of all economic value produced (regardless of the way it is accounted for).*
- Granted that services as we now know them could not exist in the absence of tools and equipment, and vice-versa, the development of the modern Service Economy implies that there has been a reversal from manufacturing to services as the main contributing factor for the generation of economic wealth.*
- Services began to make a significant contribution to the generation of wealth about 80 years ago with increasing investments in R&D. Services play a more and more important role within any manufacturing activity for control, planning, security, etc. Services are essential for storage, distribution, logistics, and maintenance.*
- The outcomes of service systems and products are used over a period of time, so often their full cost is not known at the time of sale. Here the UTILISATION value over an extended period of time becomes a crucial determinant of real performance up to and often including the last step*

*of disposal, which is, in fact, an ex-post production cost.*

- *It is essential to also remember that for over a century after Adam Smith, economics emphasized the supply side (how to “produce wealth”); but for the last century, in particular from the time of Keynes, it has concentrated on demand — first in its solvable version, and then extended more and more into its insolvable version, hence the present financial crisis.*
- *The service economy implies in any case, first of all, an understanding of the supply side.*
- *Concerning the present indicators of “value added”, such as GNP, more and more of it measures in fact “deducted value” (linked to scarcity produced by the industrial system itself, under the form of reparations, reconstructions, depollutions, etc.). On the other side, by enhancing performance, technology and communications essentially act as services, where the results need to be measured through specific indicators which are only partly accountable in the “value added” system. It is clearly obvious that the accounting of the wealth of nations has to be deeply revised.*
- *I have suggested in various publications two main possibilities: the first is to adopt indicators integrating into economics other social disciplines (sociology, demography, psychology, etc.); the other — remaining exclusively in the field of monetarized systems, but incorporating the concept of utilisation value in the service economy, using analogue methods of calculation or evaluation similar to those of insurance companies to assess the value, risk and uncertainty associated with future events, for which they collect a premium.*
- *In any case, in the old industrialized countries, there are daily hundreds of articles and papers on the hope of generating a new wave of “traditional” growth — the optimists speak of 2 or 3% growth — within the same traditional frame of reference, i.e. the classical industrial revolution perception. No vision has yet emerged calling for something practically and intellectually new and invigorating. The future is preparing something much better, and this is bound with the need for rethinking of economics — for a new and better understanding of the Wealth of Nations.*
- *For details on all these issues, see “Documents on the Service Economy” in the site: [www.newwelfare.org](http://www.newwelfare.org) (English edition)*

Orio Giarini, Editor-in-Chief

## **Introductory Paper for a Programme on The Wealth of Nations Revisited**

**Orio Giarini**, Director, The Risk Institute, Geneva, Switzerland.

**Garry Jacobs**, Vice-President, The Mother's Service Society, Pondicherry, India.

**Bernard Lietaer**, Research Fellow, Center for Sustainable Resources  
of the University of California at Berkeley.

**Ivo Šlaus**, President, South East European Division,  
World Academy of Art and Science, Zagreb, Croatia.

### **1. Introduction**

Civilization is an instrument fashioned by human beings to improve the welfare and well-being of our race through a wide range of institutions — political, social, economic, educational, scientific and cultural. When Adam Smith published the *Wealth of Nations* at the onset of the Industrial Revolution, it appeared as if a solution had finally been found to the age-old problem of scarcity. This was also a time when physical science began to uncover the laws governing the marvels of nature. It was natural and, perhaps, inevitable that early economic thinkers looked for similar laws governing society and gave inordinate importance to the system of industrial economy, since it appeared to offer enormous promise at the time. In the process they lost sight of the greater truth that, unlike the systems governing the physical universe, social systems are created by human beings for the benefit of humanity and their validity must be judged solely on the basis of their contribution to human welfare and well-being.

Current economic theory has been constructed on a foundation laid more than 200 years ago. Since then, and especially in the past half century, monumental changes have radically altered the structure and functioning of economies, to such an extent that they call into question many of the valid premises on which earlier theory was based. Among these, the evolution from a production to a service-based economic system, the growing predominance of public policy in economy, the globalization of production and markets, dramatic changes in the nature and role of money and financial markets, and fundamental changes in social aspirations and social values are especially relevant. It is now evident that economic theory cannot be separated or divorced from other aspects of human existence — political, social, ecological, technological, cultural, etc. — and that none can be validly considered without giving central importance to their impact on human welfare and well-being.

In recognition of these facts, the idea of rethinking economics has been gaining support. Late last year, a small, multidisciplinary group of individuals with membership in the World Academy of Art & Science and the Club of Rome began a fresh examination of current economic theory to examine why the basic premises of classical theory were adopted in the first place, to understand where and why they have failed or are no longer adequate to meet

the needs of the 21st century, and to consider the feasibility of evolving a more effective theoretical basis for the future.

This article sets forth the rationale and justification for a re-evaluation of the fundamental concepts and premises of modern economic theory with the goal of evolving a truly human-centered theory and practice.

## 2. Theoretical Discontent

The recent global financial crisis is only the latest in a host of significant factors that call into question the efficacy and sufficiency of contemporary economic theory. That so many distinguished economists, central bankers and policy-makers wielding sophisticated concepts and models failed to anticipate impending catastrophe is characteristic of mass hypnosis. How else to explain such a broad-based failure to comprehend issues so vital to the security, stability and progress of human civilization?

A single crisis might be an error or statistical aberration, but the events of the past few years are part of a larger trend. Since the early 1970s, national and global markets have become increasingly unstable. Beginning in Latin America, an accelerating succession of financial crises have plagued developing countries (1982), Mexico (1984), the USA (1985), Japan (1988), Western Europe (1992), Asia (1987), Russia (1998), and now the entire global system.

Nor is financial instability the only problem. Simultaneously, the world economy has been unable to generate sufficient employment opportunities to meet the needs of a burgeoning population, leaving a record 212 million people without jobs according to official ILO figures<sup>1</sup>, which grossly underestimate actual unemployment and underemployment worldwide. During the same period, growth rates in OECD countries have declined dramatically. Meanwhile, in spite of decades of economic development, today the poorest 40% of the world's population accounts for a mere 5% of global income, while the richest 20% accounts for three-quarters of world income.<sup>2</sup> More than three billion people live on incomes of less than \$2.50 a day. More than 80% of the world's population lives in countries where income differentials are widening.<sup>3</sup> Global financial assets of the wealthy have multiplied exponentially, from \$12 trillion in 1980 to \$167 trillion in 2006. Income inequality continues to grow, frustrating the rising expectations of the world's poor, and increasing the propensity for social unrest, crime and violence.

Why blame economic theory for the world's myriad disorders? The very purpose of social theory is to provide us with the knowledge and capacity to solve problems and optimize the well-being of the human race. A theory that fails to predict or provide a clear path for meeting human needs has to be considered either inadequate or failed.

There are other reasons for positing the need for new economic theory. Economic science has evolved since the time of Adam Smith, but it is still largely predicated on concepts and assumptions more relevant to 1776, the year *Wealth of Nations* was first published, than today. Smith wrote at the very onset of the Industrial Revolution, when scarcity and limited production capacity were still the dominant characteristics of human life and increasing

---

<sup>1</sup> ILO, *Global Employment Trends 2010*, p. 10.

<sup>2</sup> United Nations Development Program, *2007 Human Development Report*, November 27, 2007, p.25. <http://hdr.undp.org/en/reports/global/hdr2007-2008/>.

<sup>3</sup> *Ibid.*

production of manufactured goods was largely synonymous with improvements in the wealth of nations. When Smith wrote, 80% of the world's population lived at subsistence levels. Agriculture was still the dominant sector of the economy, providing employment to at least 80% of workers globally. It was also a time when money itself played a far less significant role. At least two-thirds of the work was done in self-production systems and almost all work was remunerated in kind.<sup>4</sup>

The economic theory and measures of value posited by classical and neo-classical economists were bound to the premise that manufacturing systems would be the dominant source of future wealth creation. Measuring increases in the monetary value of output was deemed an adequate measure of increasing wealth. Since then there has been a fundamental change in the way wealth is produced. In the 20th century the manufacture of tools and products was gradually supplanted by an economic system increasingly dependent on scientific research, technological advancement and education, giving rise eventually to the modern service economy in which services account for 64% of global output and more than 70% of employment in OECD countries.<sup>5</sup> These figures underestimate the contribution of services since in many cases they fail to take into account service functions and employment within manufacturing industries, because of the explosion of services required to raise productivity, such as storage, distribution, publicity, logistics, marketing, organization, financial systems, and recycling. For example, the cost of producing a banana represents only five percent of its sale price. For an automobile, it represents 20 to 25%. This shift to a service economy necessitates a fundamental change in the way value is measured. In addition, today the world suffers from excess production capacity backed by insufficient purchasing power. Increasing production capacity is no longer a sufficient premise for wealth generation.

Smith wrote in an age of nationalism and his economic conception is based on a competitive model of how one nation can gain advantage and dominance over others. The nation-state is only a part of global society. What works for the part does not necessarily work for the world economy as a whole, e.g. the export-driven strategy of East Asian economies and now China cannot be replicated by all nations globally. In spite of the fact that we live in an increasingly globalized economy where exports represent 20-25% of global world product, modern economic theory is still modeled on the premise of the nation-state as the basic unit and on concepts designed to maintain competitive advantage over other nations, to maximize domestic rather than global employment and domestic rather than global prosperity. Yet, according to the US intelligence community, by 2025 a single international community composed of nation-states will no longer exist.<sup>6</sup> Larger agglomerations are in the offing. We urgently require an inclusive theory that is valid for the whole world economy and will maximize benefits for all humanity. No longer can we justify economic principles that support the success of the few over the many. There is need for new theory that achieves maximum economic security, wealth and welfare for all.

Economy exists on a substratum of ecology and as an integral part of a wider social context. The failure of contemporary economics to adequately account for ecological factors is well-known. Current measures of wealth creation such as gross national product fail to distinguish

---

<sup>4</sup> Giarini, Orio and Patrick Liedtke, *The Employment Dilemma: The Future of Work*, Report of the Club Of Rome, 1996, p.114.

<sup>5</sup> OECD, *Enhancing the Performance of the Services Sector*, [http://www.oecd.org/document/2/0,3343,en\\_2649\\_33703\\_35026178\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/2/0,3343,en_2649_33703_35026178_1_1_1_1,00.html).

<sup>6</sup> "Although states will not disappear from the international scene, the relative power of various non-state actors—including businesses, tribes, religious organizations, and even criminal networks—will grow as these groups influence decisions on a widening range of social, economic, and political issues." *National Intelligence Council, Global Trends 2025: A Transformed World*, US Government, 2008, p.10. [http://www.dni.gov/nic/PDF\\_2025/2025\\_Global\\_Trends\\_Final\\_Report.pdf](http://www.dni.gov/nic/PDF_2025/2025_Global_Trends_Final_Report.pdf)

between activities that drastically deplete natural capital and those which protect or enhance the environment. In addition, recent actions of national governments to stem the global financial crisis reinforce the obvious fact that economics is inseparable from politics and that both are inseparable from social and psychological processes. Political Economy, which was born as a subset of Political Science, acquired its present shape during a century in which social science was compartmentalized and fragmented into so many different airtight compartments that are inadequate to accurately represent the complex interactions and integration which constitutes the united social life of humanity. New economic theory in particular and social theory in general are needed to bridge these gaps and arrive at a more synthetic conception.

In view of these various factors, it is not surprising to find an increasing number of economists and others calling for radically new thinking in economics. Last year Nobel laureates Joseph Stiglitz and George Akerlof published an article calling for “A New Economics in an Imperfect World”.<sup>7</sup> George Soros established an Initiative for New Economic Thinking (Inet) at the Central European University in Budapest. David Korten of the Club of Rome published a book entitled *Agenda for a New Economy: From Phantom Wealth to Real Wealth* and founded a new economy working group. Physicist J. P. Bouchaud challenged dogma regarding the efficacy of free markets, calling for a scientific revolution in Economics.<sup>8</sup> Of course, fundamental challenges to the principles and perspectives of modern economics are not new. In the 1970s, Nicholas Georgescu-Roegen, a Romanian-born economist, began to remodel economy as a living system.<sup>9</sup> Even prior to the Great Crash and Depression, Nobel laureate chemist Frederick Soddy roundly criticized prevailing theory and called for a radical restructuring of global monetary relationships.<sup>10</sup> In this article, the authors examine some of the central issues in economics which require rethinking and pose a number of fundamental questions for further consideration.

### 3. From Newtonian to Human-Centered Economics

Natural scientists since the age of Newton have sought to discover the underlying laws that govern the physical universe. Their phenomenal success over the past few centuries ignited a similar hope among social thinkers of identifying similar principles underlying the governance of human society as well. In doing so, science overlooked an obvious difference between human and physical systems. We may never fully understand how or why the physical universe and its laws came into being, but when it comes to human systems there is no mystery about their origin. Physical nature may be governed by impersonal, immutable formulas and physical constants, but human systems are the product of ideas, aspirations, values, understanding, opinions, decisions, and attitudes which evolve over time. The life of humanity is a product of the social organizations and institutions we have fashioned in the course of social evolution, which in turn have been determined by our limited understanding (ignorance), egoistic attitudes and insufficient will to arrive at a more adequate solution. It is the result of human choices made in the past, choices that can be altered at any time. They are intended to promote human welfare and well-being, whether of a small dominant minority or of humanity as a whole.

<sup>7</sup> Stiglitz, Joseph and George Akerlof, “A New Economics in an Imperfect World”, *Guardian*, October 28, 2009, [www.guardian.uk](http://www.guardian.uk).

<sup>8</sup> Bouchard, J.P., “Economics needs a scientific revolution”, *Real-World Economic Review*, issue no. 48, Dec 2008, pp. 290-291, <http://www.paecon.net/PAERreview/issue48/Bouchaud48.pdf>.

<sup>9</sup> Georgescu-Roegen, Nicholas (1970), “The Entropy Law and the Economic Problem”. *Distinguished Lecture Series No. 1*, University of Alabama, p.7-8.

<sup>10</sup> Zencey, Eric, “Mr. Soddy’s Ecological Economy”, *New York Times*, April 11, 2009, <http://www.nytimes.com/2009/04/12/opinion/12zencey.html>

As distinct from physical systems, social systems are man-made and purposeful. They are capable of conscious adaptation and evolution. As the Nobel laureate physicist Ilya Prigogine has noted, “to try to combine classical mechanics with human sciences was to attempt an unnatural marriage. Classical science described a static world, while human sciences deal with an ever-changing situation, where the idea of reaching an equilibrium is meaningless.”<sup>11</sup>

Perhaps because of the uncentralized complexity of economic systems and the myths and mystery surrounding the creation of money, all too often economists have lost sight of the obvious fact that economic systems are created by human beings for the sake of human beings, and sought instead to discover universal, impersonal laws that determine how economic systems function. Today’s economy moves at the speed of thought, but our thoughts about economy are still mired in concepts of a Newtonian world view. A report to the Club of Rome entitled *The Employment Dilemma: The Future of Work* challenges the classical conception of economics: as a “system of models in the deterministic tradition of Newton’s world as autonomous, closed, self-regulating universe, running according to predetermined laws, culminating in a static equilibrium...”<sup>12</sup> They argue, classical and neo-classical economic theory incorrectly focus on the central importance of supply and demand, rather than on the central importance of human welfare. In an effort to imitate the impartiality and objectivity of the physical sciences, social scientists have generally chosen to study existing social systems as they are, rather than formulate theories describing what they should be. There may be no place for ethics in physical nature, but a sense of right, truth and justice is the very essence of what makes us human.

The divorce between traditional economic knowledge and evolving human values lies at the heart of the problem with contemporary economic models which regard financial markets as a law unto themselves, without considering their appropriate role in the economic welfare of society. Consequently, financial markets, which were originally established to serve as a stimulus to economic development, have now acquired an independent status of their own and function in a manner that jeopardizes the very economy they were intended to support. They have opened the door to the possibility of indiscriminate money and debt creation unrelated to either the economy or human welfare.

The same error applies to economy. Society is the whole of which economy is a part. Economy is the whole of which money, markets and employment are parts. Economics is one aspect of human life, one contributing factor to human welfare and well-being. When monetary systems are regarded as things in themselves and ends in themselves, they produce aberrations that not only threaten the underlying economy which they are intended to serve, but the entire society of which economy is merely a part.

The need for new theory is self-evident when we recognize that neither classical nor contemporary theory provides an adequate solution to the most central issue of economics. The goal of economic systems is the generation of wealth to promote human welfare, not financial speculation. The assertion that the laws of economics make it necessary for some people to remain unemployed in order to ensure employment for the majority or that gross inequalities in the distribution of incomes and wealth are natural and inevitable is to mistake historical injustice for eternal truth. Just as the world has discarded the exclusive, discriminatory political principles of monarchy and colonialism in favor of democratic principles of freedom and

---

<sup>11</sup> Giarini, Orio and Walter Stahel, *The Limits to Certainty*, Kluwer Academic Publishers, Dordrecht/Boston, 1993, xv.

<sup>12</sup> Giarini, Orio and Patrick Liedtke, *The Employment Dilemma: The Future of Work*, Club of Rome, 1997, p.60-61. <http://eng.newwelfare.org/2006/10/21/abstracts-from-the-employment-dilemma-and-the-future-of-work/>

equality, economic systems can and must evolve in conformity with universal human values to meet the needs of the entire human community. We human beings make the laws that govern economy as well as polity. If we do not like them, we have the power to change them. We are in an era in which the challenge is to find the best optimal and complementary combination of private and public. For instance, state intervention in the Swiss pension system, arguably the best in the world, makes possible an active role for complementary private institutions. New theory needs to address fundamental questions. What theoretical framework will lead to a system that optimizes the generation of real wealth? How will its principles reflect the primacy of human choice and human welfare? How will it effectively and justly reconcile the rights of the individual with the overall welfare of the social collective and humanity as a whole?

#### 4. Future of Work

What is true of economics as a whole, is true of employment. *The Employment Dilemma and the Future of Work* re-examined the issue of employment in the context of the evolving social context, underlining the need for new economic theory on employment in order to fulfill Adam Smith's dream of the *Wealth of Nations*. Instead of looking at employment through the eyes of existing theories, "we have to understand why the old theories were created, where and why they fail now and then propose a feasible, more efficient alternative..."<sup>13</sup>

In formulating a new theory of employment, it is both good sense and good ethics to start with the premise that any system which purports to represent sound economics must provide a viable means for all members of society to acquire at least the minimum (why not the optimum?) level of purchasing power needed for survival, development and full enjoyment of their human potential. If economic systems based on current theory are unable to provide sufficient employment opportunities, it means either the prevailing theory or its application is deficient. Since the problem of unemployment is so widespread, we may safely assume the fault lies in the theory itself, as this conditions adequate practical applications. The failure of theory is self-evident, but most social thinkers — Marx is an obvious exception — have been constrained from evolving alternatives.

There are only two possible solutions to the problem of human welfare. Either all members of society must have ample opportunity to acquire the good things of life by their own enterprise. Or in the absence of such opportunities, society must provide adequate support for all its members in the form of social welfare benefits. Anything less than this can only be considered a first rough approximation, a crude clumsy attempt at social development in need of radical reform.

Common sense tells us that there is no inherent reason why we cannot devise an economic system in which everyone that is willing to work and capable of productive activity is assured of an opportunity and means to do so. It is not as if all possible human wants are already being met and there is no further work to be done in the world. Far from it. According to *The Economist* over half the world's population now belongs to the middle class, as a result of rapid growth in emerging countries. By middle class, it means those having a reasonable amount of discretionary income, so that they do not live from hand to mouth as the poor do.<sup>14</sup>

---

<sup>13</sup> Giarini, Orio and Patrick Liedtke, *Op. cit.*, p. 15.

<sup>14</sup> Parker, John (2009-02-12), "Special Report: Burgeoning bourgeoisie", *The Economist*, 2009-02-13, [http://www.economist.com/specialreports/displayStory.cfm?story\\_id=13063298&source=hptextfeature](http://www.economist.com/specialreports/displayStory.cfm?story_id=13063298&source=hptextfeature), retrieved 2009-12-13.



This estimate still leaves more than 3 billion people in need of the minimum requirements for a comfortable living. Even in OECD countries, there is an urgent need to generate additional employment opportunities. The EU has set the goal of raising the overall employment rate within the region from 69% to 75% of those aged 20-64 by 2020, while lifting 20 million people out of poverty.<sup>15</sup>

Obviously, there is a great deal of work that is not getting done in the world, work that would raise the other half of humanity to middle class status. Apart from this, humanity has an insatiable appetite for more education at all levels, improved health care, more and better attention to the needs of children and the aged, better community development, more research, new forms of entertainment, infrastructure improvements, etc. So we have a vastly underutilized resource — human beings — estimated by Randall Wray as 17.5% of the work force in the USA alone, and we have a plethora of unmet social needs.<sup>16</sup> Incidentally, Wray also argues that the social costs of high unemployment in terms of loss of human capital, poverty, social isolation, crime, regional deterioration, health issues, family breakdown, school dropouts, social, political and economic instability, violence, ethnic hostility, and even terrorism far outweigh the cost of public jobs program to achieve full employment. But long term, there should be and is a better way than public jobs programs.

That requires formulation of new theory, not just modification of prevailing concepts. There is no reason why we should not formulate a theory of economics based on the premise that all members of society have a right to employment, a theory that not only affirms the right but also presents the structures and processes by which this can be achieved.

During Smith's time, production was largely dependent on labor and, therefore, economic growth might be largely synonymous with growth of employment opportunities and incomes. This is no longer true. Today technological development makes it possible to multiply production and expand economically with less human labor, challenging society to find ways to redistribute the privilege and benefits associated with employment to cover all its members, which is a question of social engineering. In addition, employment markets are no longer national. The globalization of production by MNCs makes it possible to source goods from anywhere in the world. Outsourcing is doing the same for many types of services. But regulation and economic policies to maximize employment are still confined to the national level. Our employment models and policies are nation-centric. How will the new economics reconcile global labor markets with national-level employment policies?

So long as employment remains the principal means by which people acquire the money needed for the goods and services they need for survival and welfare, the growing separation between production and employment will spell increasing hardship and catastrophe. How will the new economics reconcile optimal efficiency of production with full employment? What place is there in a human-centered economics for theory based on the premise that employment is a natural right which must be guaranteed? How can such a right be assured without problems of moral hazard?

New theory needs also to look to a future time when the evolution of the global production system may make it possible for a relative small portion of the world's population to provide for the needs of all human beings. What then will be the role of employment in ensuring equitable distribution of incomes?

---

<sup>15</sup> European Commission, EUROPE 2020, <http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf>

<sup>16</sup> Wray, Randall, "Full Employment Through Direct Job Creation", webcast presentation to the World Academy of Art & Science, November 10, 2009, <http://www.worldacademy.org/files/Job%20Guarantee%20Wray%20presentation%20on%20Nov%2010%202009.pdf>

## 5. Money, Finance & Wealth

Although money is the foundation of modern economics and economy, it is remarkable that more attention is not given to what money actually is, as if the answer to the question were too obvious to merit serious discussion. Without a clear conception of money and wealth, no economic theory can attain comprehensive preciseness. Economists commonly define the functions of money and central bankers define a variety of measures for money, but that is very different from defining the thing itself, assuming money is a ‘thing’, which takes us to the heart of the issue and one of the commonest misconceptions about money. Money is not a ‘thing’; it is a symbol, an energy, a force, a social organization and a power for accomplishment.

The history of money attributes the origin of coins to ancient Lydia and China and traces the earliest forms of banking and paper currency in ancient Egypt — the receipts issued for grain deposited in state warehouses, marking the evolution of money from a physical thing to a symbol with no intrinsic value of its own. Initially related to the mining of precious metals or the production of food grains, money gradually evolved into a social system to measure the store of value, increasingly distinct from the things it was used to produce.

Like language, money is a system or organization for fostering relationships between human beings. Thus, money developed in parallel with the development of trade. The role of money as a medium of exchange in trade marked the second important stage of its development. Instead of people generating wealth by production on the land, they learned to do so by exchanging goods and services with others in the marketplace. The center for wealth-creation shifted from production to the market, from physical work to human relationships.

Each commercial transaction created additional profit for the trader as well as additional trust that could be converted into credit for further exchanges. The multiplication of trade based on credit multiplied money and led to the rise of merchant banking in Italy during the late Middle Ages. Thus, mutually beneficial human relationships became the primary basis for wealth generation. Through this process, money came to represent the capacity to get any type of work done — to maintain an army, trade in goods and services, acquire political power, even religious indulgences. In a word, money came to represent social capacity or social power.

The rise of banking and central banking marked the transition to a third stage in which money evolved into a complex social organization closely linked to the centralization of political power, forming the basis for emergence of the modern nation-state. It is remarkable to note that the failure of the Roman Empire 1000 years earlier to discover the power of the state to create money by borrowing from the public was one of the principal reasons for its collapse. The empire died of bankruptcy without owing money to anyone. The nation-state was born when central banks began to organize public debt.

Money came into its own as the pre-eminent social institution it is today, only after the advent of the Industrial Revolution. Until then more than 50% of all economically productive activity was self-production for self-consumption or barter, i.e. it occurred without monetary exchange and remained non-monetarized. As we shall discuss below, even today money systems represent only a very limited portion of what truly characterizes the wealth of nations. Ecological resources are a good example of non-monetarized aspects of wealth. Both unmonetized and non-monetarized wealth are inadequately accounted for in traditional economic theory.<sup>17</sup>

---

<sup>17</sup> Monetized refers to systems in which money is used for exchange. Non-monetarized refers to systems in which non exchange is conceivable. Unmonetized refers to systems in which exchange takes place without the use of money, as in barter exchange.

Classical conceptions of money lead to narrow, distorted concepts of productive activity, capital and wealth. As ecological economists have been claiming for decades, measures that do not take into account environmental sustainability are inherently flawed. But the problem goes much deeper. Current concepts also fail to take into account a wide variety of other capacities that are intimately related with production, capital and wealth. A healthy, aging population of knowledgeable, experienced workers represents a precious reservoir of productive potential that is completely overlooked by current reckoning of wealth. Capital is the capacity to create real wealth on an on-going manner. Thirty years ago, *Dialogue on Wealth and Welfare*, a report to the Club of Rome extended the notion of capital well beyond the traditional boundaries of economics, distinguishing four major categories of capital — natural or physical, biological, man-made or cultural and monetarized. All forms of capital exist in a synergetic relationship as part of an evolving continuum, e.g. science, a form of cultural capital, is also the generator of technological capital.<sup>18</sup> In an upcoming book, Bernard Lietaer and Gwendolyn Hallsmith identify ten different forms of capital — human, natural, built, social, technological, historical/cultural, institutional, entrepreneurial, financial and potential exchange capital.<sup>19</sup>

New economic theory needs to redefine our concepts to fully reflect both the potential and actual power represented by human knowledge and skills, social and technological capacities, organizational expertise and political institutions, cultural values and attitudes that constitute the bedrock of wealth, welfare and well-being. Money is created by social activity, by movement. Advances in social development accelerate and multiply social movements, thereby enhancing society's capacity to accomplish work and generate wealth. Money and wealth are created by faster communication and transportation, better education and health, improved technology, advanced systems and management expertise, a more peaceful and stable social environment, greater tolerance and harmony, higher levels of trust and reliability. Economic theory needs to take into account the precise relationship between money, economy, civilization and culture.

The confusion regarding money and wealth has immense practical consequences. It leads to the pursuit of financial activity as an end in itself, divorced and even opposed to economic well-being and human welfare. Today, trillions of dollars circle the globe every day in pursuit of higher speculative profits, 95% of it unrelated or negatively related to any real contribution to society. Unthinkingly accepted as inherently beneficial or economically indispensable until crisis strikes — Nobel prizes have been awarded for developing more effective computerized trading systems for speculation — we rarely stop to recall the original and essential role of financial activity or to consider the negative implications of unbridled speculation.

David Korten reminds us of the original purpose of money and financial markets. "*From the standpoint of society, money is properly treated as a means, not an end. Rather than directing money to financial speculators and scam artists devoted to creating phantom wealth for personal gain, we must create proper official money systems designed to effectively link underutilized resources to unmet needs to improve the health of our children, families, communities, and the natural environment.*"<sup>20</sup> He implies that an essential deviation has occurred by which the means or instrument (financial transactions) has become an end in itself. This is not only true of money. It can happen with technology, education, government and any other human institution or activity.

---

<sup>18</sup> Giardini, Orio, *Dialogue on Wealth and Welfare — a Report to the Club of Rome*, Oxford, Pergamon Press, 1980.

<sup>19</sup> Hallsmith, Gwendolyn and Bernard Lietaer, *Intentional Cities, Intentional Economies*. (forthcoming 2010).

<sup>20</sup> Korten, David, "Path to a Just and Sustainable New Economy", Revised and expanded version of a presentation delivered to The EU Club of Rome, Brussels, January 26, 2010.

*Dialogue on Wealth and Welfare* reminds us that like other made-made powerful tools, financial capital formation can be either positive or negative, depending on the values it is used to express. "The production of powerful tools is one thing, but the definition of their goals and their positive utilization is a matter of human choice and responsibility."<sup>21</sup> If money is a means and not an end, what purpose was it intended to serve? What purpose is it serving now? What has changed, how and why? Korten says money systems should be designed "to effectively link underutilized resources to unmet needs to improve the health of our children, families, communities, and the natural environment." Is this the true role of money? How far is money playing that role? Where and how does it fail? Is the problem fundamental to the type of money we have today or is it a distortion that can be rectified by modifying the system?

Korten goes even further to condemn bank-generated money and makes a distinction between phantom money and real money. When \$50 trillion global financial assets disappeared in 2008, it is natural to wonder whether that wealth was ever truly real, and, if so, where it has gone?<sup>22</sup> The fact that a momentary collapse of public trust and confidence can destroy real wealth of that magnitude, points to the necessity of redefining money and wealth to highlight its sociological and psychological underpinnings.

A clearer conception of money is essential to answer these and related questions. It will also enable us to properly consider other forms of money that are not created by banks or national governments. At the height of the Great Depression, an experimental currency introduced in the town of Woergl, Austria wiped out 30% local unemployment in a short time. Today more than 2500 complementary or local currencies are being utilized by communities, NGOs and corporates to compensate for the inadequacies of national money systems, often with remarkable effectiveness. As we write a plethora of non-national money systems are gaining currency on the Internet. Yet, mainstream economic theory does not adequately account for the capacity of these supplementary systems to harness unutilized resources to provide for unmet social needs. Nor does it help us assess the ultimate potential for creating innovative monetary systems.

Lietaer and Hallsmith show the need for more than one type of currency to measure and build the different types of capital. Furthermore, social and human capital can be consciously built with these new tools. Albeit most of complementary money systems are too small scale to address the underlying issues at the scale needed, they have already proven that a variety of money systems accomplishes this better than a monoculture of a single currency. There is now convincing evidence that the prevailing monetary monoculture is at the root of the instability of the monetary and financial system itself. Indeed, quantitative ecologist Robert Ulanowicz has recently demonstrated that the sustainability of any complex flow system turns out to be an emergent property of its structural diversity and interconnectivity; it requires a balance in emphasis between efficiency and resilience.<sup>23</sup> Natural ecosystems are our most practical exemplars of large scale long-lasting sustainability: enduring, vital, adaptive. The same principle governs all complex flow systems, including economic and financial systems. Nature's urgent message for economics is that the monoculture of national currencies, justified on the basis of market efficiency, generates structural instability in our global financial system. Economic sustainability requires diversification in types of money through complementary systems.<sup>24</sup>

<sup>21</sup> Giarini, Orio, *Dialogue on Wealth and Welfare*, p. 186.

<sup>22</sup> Adam, Shamim, "Global Financial Assets Lost \$50 Trillion Last Year", ADB Says, Bloomberg.com, March 9, 2009, <http://www.bloomberg.com/apps/news?pid=20601068&sid=aZ1kcJ7y3LDM>.

<sup>23</sup> Ulanowicz, R.E., Goerner, S.J., Lieater, B., Gomez, R., 2009, "Quantifying Sustainability: Resilience, Efficiency and the Return of Information Theory", *Ecological Complexity*, 6 (1), 27-36 March.

<sup>24</sup> Lietaer, Bernard; Robert Ulanowicz; Sally Goerner; and Nadia McClaren: "Is our Monetary Structure a Systemic Cause for Financial Instability: Evidence and Remedies from Nature", *Journal of Future Studies*, April 2010.

## 6. The Service Economy

The foundation of new economic theory has to take into account the evolutionary changes that have occurred in the global economy since Smith's time. As agriculture became the foundation for the rise of the industrial sector in the 19th century, during the 20th century manufacturing has given rise to emergence of the modern service economy, in which R&D, marketing, financial activities, education, health, waste management and other services constitute more than two-thirds of all global economic activity. Traditional economic theory still distinguishes three distinct sectors — agricultural, industrial and services. The notion of a distinct tertiary service sector overlooks the spectacular increase of service functions within the traditional productive sectors. Today service functions are integrated with and predominant in all types of economic activity; indeed, 80% of what is regarded as manufacturing now consists of service activities. In 1980, *Dialogue on Wealth and Welfare* observed that rising concern regarding the "Limits to Growth" were in fact indicating the end of the Industrial Revolution phase of economic development, not of growth per se.<sup>25</sup>

Fundamental differences between the industrial economy and service economy and their implications for economic theory were explored in detail in *Limits to Certainty* (1993).<sup>26</sup> The service economy is not an outgrowth detached from the industrial productive structure, but rather a system that permeates that structure, making it predominately dependent on the performance of service functions as indispensable tools both within and outside the production process. Insurance is a typical example. The evolution of the service economy has also brought about a change in the definition of what constitutes a basic need. "The New Welfare that has to be developed in the future must, inevitably, take account of the context of the New Economy which is characterized by the predominance of services as factors of production. This, rather than the limits to the industrial revolution, is the key change in economics as basis for the building of the wealth of nations."<sup>27</sup>

Classical economics was founded on the idea of the nation-state as the basic unit of economic activity. In contrast, today's service economy has to be thought of as a global process involving the whole world economy. It is not an add-on to the Industrial Revolution, but rather a subsequent phase in the evolution of the global economy. That integration spans the globe in agriculture, manufacturing, financial services and even retail. As the recent financial crisis illustrates, many traditional concepts and policy options are no longer relevant.

Modern technology has, in most cases, greatly reduced manufacturing costs, while increasing the cost of services associated with both production and utilization. As in manufacturing, the service economy also depends on the manufacture of products and tools needed for service delivery. There is no service without products anymore than there can be products without services: simply the ratio between the two types of activity has reversed in the contemporary service economy. Therefore, it is also subject to the constraints related to non-renewable energy and material resources; but, in services, the human resource becomes by far the most important resource and the quality of that resource has a profound impact on service delivery and quality. Knowledge, skill, values, attitudes, managerial and

---

<sup>25</sup> Giarini, Orio, *Dialogue on Wealth and Welfare*, Club of Rome, 1980.

<sup>26</sup> Giarini, Orio and Walter Stahel, *The Limits to Certainty*, preface by Ilya Prigogine, Kluwer Academic Publishers, Dordrecht/Boston, 1993.

<sup>27</sup> Giarini, Orio, "Notes on the Service Economy: The Context for the New Welfare," *Discussion Paper*, [www.newwelfare.org](http://eng.newwelfare.org/wp-content/pdf/Giarini_THE_SERVICE_ECONOMY.pdf) [http://eng.newwelfare.org/wp-content/pdf/Giarini\\_THE\\_SERVICE\\_ECONOMY.pdf](http://eng.newwelfare.org/wp-content/pdf/Giarini_THE_SERVICE_ECONOMY.pdf).

organizational capabilities determine the quality and productivity of the human resource. Continuous development of people in terms of higher levels of knowledge and skill becomes the most essential strategy to support continuous growth of the service economy.

Every science requires effective measures for evaluation of results. The evolution of the service economy has profound implications on economic theory for it calls into question our very conception of wealth and the way economic value is measured. The Industrial Revolution gave rise to measures of the increase in the economic value of the flow of production through various stages of manufacture, assuming that the production process was complete the moment a product or tool was available for sale on the market and that all costs associated with its manufacture contributed positively to wealth-creation. Thus, gross national product emerged as a standard measure for production and wealth-generation in a monetarized, manufacturing-based economy.

*Limits to Certainty* enumerates several ways in which the predominance of services alters the fundamental notions of economic value on several counts.<sup>28</sup> First is the problem of risk. Traditionally economists have spoken about 'use' with reference to the application for which the product is intended after sale and 'cost' with reference to the stages of production and distribution up to the point of final sale. In contrast, services are delivered over a period of time and the full cost of delivery usually cannot be assessed at any single moment, before or after the sale. The real value of products and services is concerned with the period of utilization, which contain new uncertainties that cannot be fully assessed at the time of service delivery.

The development of telecommunications, of banking and financial services, of insurance, of maintenance and engineering, cannot be accounted for in terms of their being merely new kinds of "production", extensions of what had already occurred in textiles, iron and steel and the chemical industry. Selling a product (i.e. a machine) once (i.e. at a given moment in time) is a different business from fulfilling a maintenance contract over an extended period of time, during which the seller remains contractually committed to the consumer for the utilization of the "product". Even within the service sector, significant differences exist with regard to valuation, e.g. differences between banking and insurance. For these reasons, static, deterministic notions of value as representing by the equilibrium between supply and demand no longer apply. Thus the valuing of services involves new types of entrepreneurial and commercial risk and far greater degrees of complexity, vulnerability and uncertainty. Value in the new economy is probabilistic, rather than deterministic.

These differences underline an even more fundamental problem with valuation based on classical economic theory. The goal of economics is wealth-creation, yet economics does not now possess a competent definition or measure for what wealth actually is. GNP and similar measures reflect changes in the flow of economic activity rather than the real stock of wealth in society, under the premise that all positive contributions to flow result in an increase in the stock of wealth. We now recognize this is not true for a variety of reasons. Some forms of economic activity consume more capital than they generate. Consumption of non-renewable resources generates a flow by consuming an irreplaceable asset. War increases output and flow for an activity which actually destroys the products produced along with other natural and social forms of capital. Like a company without a balance sheet to distinguish between

---

<sup>28</sup> Giarini, Orio and Walter Stahel, *The Limits to Certainty*, preface by Ilya Prigogine, Kluwer Academic Publishers, Dordrecht /Boston, 1993.

investment and expenditure, asset creation and asset destruction, modern measures of economic activity are virtually blind to these distinctions. Thus, there is need for “a more comprehensive theory of wealth and welfare...”.<sup>29</sup>

The problem of value is further aggravated by the dramatic shift in emphasis from quantity to quality, which has characterized the evolution of the service economy. The majority of human beings are no longer concerned with having sufficient food, clothing and shelter for their very survival. The growth of the service economy signifies an advance beyond subsistence levels of existence. What were considered luxuries a century ago are now considered necessities of life that have significantly enhanced human welfare. Even during the 1930s, unemployed Americans were seen driving to soup kitchens by automobile. Motor vehicles, telephones and televisions can be found even in the poorest regions of developing countries. Education, social security, medical care, insurance, travel, mobile phones and entertainment have become essential primary goods for the vast majority. Indeed, the service economy is continuously giving rise to new services to meet higher human aspirations and provide greater fulfillment and enjoyment.

This qualitative improvement extends not only to the range of products and services but to their quality as well. The automobile today is very different from the Model T Henry Ford built a century ago as the ‘car for the common man’. The average educational level of the population as well as the quality of education have risen enormously. Only one PhD was awarded in the entire US in 1880. Today, more than 50,000 are awarded annually. Improvements in health and medical care are only crudely reflected by statistics on life expectancy. People today are not only living longer; they are healthier, more active, energetic, and comfortable than any previous generations. The Internet is perhaps the most impressive illustration of this remarkable qualitative change in human life. Never before have people around the world had free or very low cost access to such a wide range of information, communication, products, education, entertainment and the capacity to reach out to other human beings.

All of these factors pose serious challenges to economic theory. In combination they indicate that current measures of production, living standards and wealth are grossly distorted. They severely underestimate real costs as well as real benefits in terms of human welfare. New measures based on new theory are absolutely essential for charting an effective course for humanity’s future prosperity.

## 7. Scarcity, Surplus & Markets

Inadequate production capacity combined in Smith’s day with severe shortages of land and most raw materials, leading Malthus to postulate that population growth would soon outstrip food production. Smith formulated the Wealth of Nations during an age of scarcity, just a year after the invention of the steam engine, when food, clothing and virtually all other economic goods were in short supply. Social thinkers of his age believed that a combination of mechanization, specialization and division of labor, and free markets would finally solve the problem of scarcity. Industrialization rose on the foundation of agricultural production and in turn stimulated a substantial increase in agricultural productivity. Since then, technological development has multiplied productivity; and industrial economy has made unprecedented progress in the generation of material abundance. Over the past two centuries, increased availability of food

---

<sup>29</sup> Giarini, Orio, *Dialogue on Wealth and Welfare*, p. 202.

resulting from technological improvements in agriculture combined with the dissemination of modern medical technology, enabled global life expectancy to rise from an average of 30 years to 67 years. This achievement significantly contributed to a six-fold multiplication in population during this period, a crude though insufficient measure of the magnitude of humanity's enhanced capacity for survival.<sup>30</sup> During the same period, real per capita income has risen 10-fold globally, 15 to 20-fold in most OECD countries.<sup>31</sup>

In spite of this remarkable achievement, the problem of scarcity and poverty were not fully resolved. From the beginning of the Industrial Revolution until the 1920s, it was generally believed that any increase in production would be absorbed by the market. Then a situation emerged in which there was insufficient money to purchase all that was produced. Only later did economists come to understand the importance of solvable demand. This led Keynes and other economists to turn their attention from the problem of supply to the problem of creating sufficient demand to distribute the ever increasing production capacity. Keynes concluded that generation of debt was acceptable, provided it was used to absorb production that could otherwise not be absorbed, but warned against generating debt beyond this level, although his name has been used in recent decades to justify any level of debt. The key reference was demand. In the process, economists lost sight of the complex structural changes taking place on the supply system, most especially with the evolution of the service economy.

Today the global spread of production capabilities and the globalization of trade make it possible for one or few companies or countries to produce the entire world's requirement of many products. Together they support a global population of more than 6.5 billion, half of them at middle class living standards. Yet at the same time widespread poverty linked to high levels of unemployment and underemployment are glaring reminders that economic theory and practice remain incomplete.

The problem arises because production and consumption have been dealt with theoretically as if they are independent functions linked by the mechanism of market, rather than two complementary aspects of a single, integrated whole which is economy. Market is, no doubt, a remarkable mechanism, which has done admirable service to humanity. But left to itself, it often leads to conspicuous waste and obvious failures. Unregulated markets give rise to an economy of excess production capacity and periodic overproduction, resulting in economic instability, bankruptcies, wastage and massive dislocation of workers. Today excess production capacity in combination with distribution and maintenance costs is a serious threat to economic stability and growth. Moreover, the globalization of production makes it increasingly difficult to manage or regulate production to mitigate the problem, since information systems and controls are still largely confined to the national level. Smith's economics was based on the capacity of the market to arrive at a natural equilibrium. But as in the case of monopolistic constraints on supply, overproduction can generate conditions in which the equilibrium state generated by the market is far from optimal for wealth generation and human welfare. Highly effective as a mechanism to mitigate unbridled human greed, market is poorly qualified to promote true justice and equity. As we will discuss later, without equitable distribution, the economic problem can never be fully and satisfactorily resolved.

New economic theory has to supplant the 18th century notion of self-regulating local and national markets with sound principles for effective regulation of an increasingly integrated, single global market. It needs to place human welfare and well-being at the center and regard

---

<sup>30</sup> Shelton, Nicola, "Reviewed Work: Rising Life Expectancy: A Global History by James C. Riley", *Population Studies*, Vol. 57, No. 2 (July., 2003), p. 234-236, published by Population Investigation Committee, <http://www.jstor.org/stable/3595757>.

<sup>31</sup> Maddison, Angus, *The World Economy Historical Statistics*, OECD, 2003, p.



production, consumption and markets as means to serve this central human objective, rather than as ends in themselves. The central theoretical issue is how to integrate production and consumption within a comprehensive framework. New theory needs to answer questions such as: How can global production be effectively balanced for economic stability to maximize the fulfillment of human needs? What should be the governing principles and mechanisms for balancing supply and demand in the new economics? What will new economic theory postulate regarding the potential future prosperity of humanity?

## 8. Equity, Freedom & Social Stability

The history of human progress over the past two centuries has been characterized by increasing equality in terms of political and social rights, freedom, voting rights, universal education, etc. For decades, development economists and social leaders have condemned on ethical grounds the blatant and growing inequalities between rich and poor within and between nations. In response, what is morally unjustifiable has been justified economically as materially beneficial to the welfare of society. The justification of economic inequality is inconsistent with the abundant evidence that the extension of benefits to lower sections of the population is both beneficial and essential for the maximum welfare of society as a whole. In a recent book, Richard Wilkinson and Kate Pickett cite solid evidence to show that more inequality results in shorter life expectancy, more health problems, less trust, more crimes, etc.<sup>32</sup> A new economics has to take into account the role of equity and inequality in terms of both ethics and social welfare. What is the true place of equity in economics and human life?

Freedom and equality are complementary values. Yet since the demise of communism, economic theory has swung back in favor of an extreme form of unregulated wealth-creation leading to rising inequalities. A new economics should examine the rightful role and reconciliation of these complementary values. The problem of equity is also inextricably bound to ecological issues and the notion of sustainability. On a global basis, equity implies equal right to the resources of the planet. On a time scale, it implies equal right of future generations to welfare and well-being. For both reasons we are compelled to consider the longer term impact of current economic activity and ensure the sustainability of whatever model we endorse. Nor can valid economic theory be isolated or divorced from concerns regarding political and social stability. The principles of a new economics must take into account the wider goals of social stability and human welfare, not just the narrower goals of wealth generation by producers. Evidence abounds that growing inequality between communities and nations rather than absolute levels of poverty is the principal cause for terrorism and rising social unrest in the developing world. Lack of employment opportunities is believed to be a significant factor in the propensity of youth to join terrorist movements. According to the US National Intelligence Council, “unless employment conditions change dramatically in parlous youth-bulge states such as Afghanistan, Nigeria, Pakistan, and Yemen, these countries will remain ripe for continued instability and state failure.”<sup>33</sup> The same is true of the poor and unemployed in China, India and other developing countries. India’s introduction of a National Rural Employment Guarantee Scheme in 2005, which now provides 100 days of assured employment to more than 45 million families, is based on rising concern over growing inequality. The instinct for survival combined with limited opportunities and

---

<sup>32</sup> Wilkinson, Richard and Kate Pickett, *The Spirit Level, “Why Equality is Better for Everyone”*, Penguin Books, 2010 revised edition, first published by Allen Lane 2009.

<sup>33</sup> National Intelligence Council, *op. cit.*, p. iv.

frustrated expectations is easily transmuted by aspiring leaders into an aggressive attitude that generates real threats to social stability at the local, national, regional and global level.

## 9. Integration of Politics — Economy — Society

Economics is concerned with the process of increasing the capacity of society to attain higher standards of living. But economic activity takes place in an ever-changing, ever-evolving context. Society is constantly generating new ideas, new needs, new technologies, new products, higher aspirations, growing expectations, higher levels of productive capacity, more complex organizations, and, as a result, higher levels of material security and enjoyment. Social development is a complex social process that involves political, social, psychological, technological, organizational, cultural and ecological factors. Our ideas, understanding, perceptions, social attitudes, psychological aspirations and cultural values are crucial determinants of this process. Ultimately a new economics must be founded upon and consistent with an underlying theory of social development applicable to human progress in all fields of activity.

While in principle the social sciences can be neatly divided into distinct disciplines, in practice, economics, politics, sociology and psychology are inseparable dimensions of a single, integral reality called society. The impact of public policy on economy is dramatically illustrated by recent efforts of governments around the world to cope with the financial crisis by modification in interest rates, capital margins, government spending on stimulus packages, job creation programs, tax rates and incentives, regulation of financial institutions and international financial transactions. These are in addition to the normal application of public policy instruments for controlling inflation, securities trading, determining minimum wage rates, underwriting housing finance, unemployment insurance and welfare benefits, investment in infrastructure development and other public works, control of exchange rates and management of the public debt. Beyond this, virtually every area and aspect of modern economic life is governed by laws and procedures relating to product quality, safety, public health, zoning, licensing, emission standards, land and water pollution, recycling, and so forth.

The modern market economy was a natural outgrowth of the rise of liberalism and political democracy in the West. The extension of freedom and democratic rights to every citizen has gradually led to the emergence of economic democracy as well, in which each individual casts monetary votes according to his individual needs and capacity. In the absence of basic human rights, economic life as we know it today is inconceivable. The increasing prosperity of humanity is predicated upon the rising value according to each human being.

The inextricable linkage between economics and polity is illustrated by the severe debt problem in Greece, Spain and Portugal, as a consequence of the global financial crisis. Paul Krugman argues that economic and political integration are both moving forward among the members of the EU and Euro zone, but at different speeds and to different degrees. Having joined the Euro, these countries are no longer able to regulate domestic interest rates or national exchange rates to offset severe budget deficits because political integration has not gone as far as economic integration. He contrasts this situation with that of states in the USA where federal government spending and high levels of cross-border labor mobility can offset state-level problems in considerable measure<sup>34</sup> Economy and polity are inseparable.

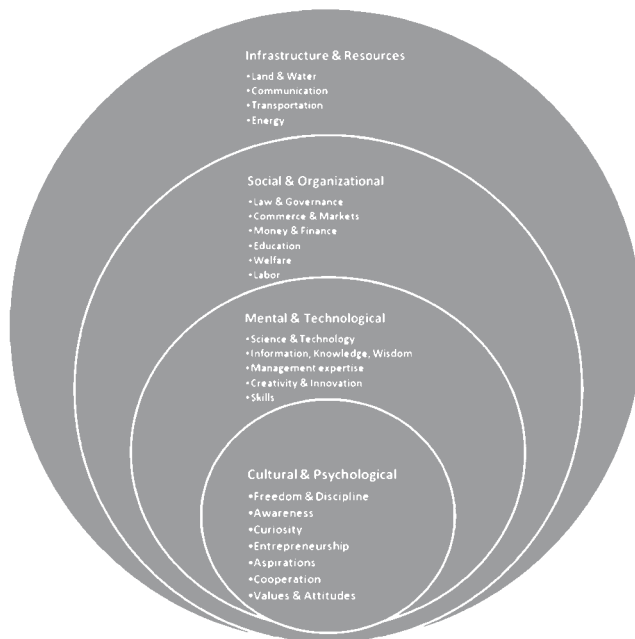
---

<sup>34</sup> Krugman, Paul, "The Making of a Euromess", *New York Times*, February 15, 2010, <http://www.nytimes.com/2010/02/15/opinion/15krugman.html>.

The impact of social factors on economy is equally pervasive, though less apparent. Educational and skill levels of the population are primarily determined by social attitudes and organization. Public confidence and expectations regarding the economy and government strongly influence levels of investment, production, and consumption. Rising aspirations provide the energy and dynamism for continuous growth. Social values related to honesty, trust, responsibility and hard work determine the capacity of society to absorb credit. Psychological attitudes regarding risk and entrepreneurship, technological change, employment of women, retirement, freedom, leisure, equality, and authority underpin all aspects of economic behavior. When examined closely, we find that economics is part of an intricately fashioned web of human values, attitudes, decisions, systems and social organizations.

Economic growth and social development seem to take place between two poles — one collective, the other individual. Collectively we see that the development of economy occurs within a social macrocosm of public and private organizations, formal and informal institutions related to money, markets, banking, trade, governance, research, education, and so forth. This macrocosm is constantly growing in complexity and expanding in scope from the local and national to the global level. At the other pole is the individual citizen, the single human being, who is also constantly developing and evolving, acquiring greater knowledge and skills, new attitudes and aspirations, higher values and goals, both for personal fulfillment and for the development of the community, nation, world-at-large. Ultimately, economic theory has to be founded on the fundamental process of social evolution as it unfolds in the individual and the collective. New economic theory and understanding must be based on an all-inclusive perspective of society as a whole.

Constructing a comprehensive, integrated perspective of economics as one aspect or expression of human social activity is a challenging task. To be comprehensive, it would have to take into account a wide range of factors as depicted in the table below:



An integrated perspective would have to depict not only the full range of factors that determine economic development and performance, but also their interrelationships and interdependencies. All these factors are only various expressions of more fundamental social processes. The foundation of all these processes are principles governing the functioning of the social collective and the role of the individual as leader and member of the collective. We have to also take into account the fact that human systems are constantly evolving consciously or subconsciously in response to new or changing ideas, information, opportunities, challenges, discoveries, attitudes and perceptions. Therefore, our conception must ultimately be based not only on knowledge of the fundamental components but also on knowledge of the process by which they and the systems they constitute grow, develop and evolve. Knowledge of those fundamental processes will give us the power to refashion or evolve the systems to better meet human needs and humanity's welfare.

Formulation of a comprehensive, integrated conception is not sufficient. This conception must have the power to generate positive practical results - to eradicate problems and create opportunities. In social systems, that means we must be able to translate our conceptions into more effective forms of social organization and we must be able to fashion effective strategies to effectuate the transition. The task of formulating a human-centered science of economics or society is one which will require a multi-disciplinary approach that combines and integrates many perspectives and seeks for a common foundation that synthesizes economic, political, legal, social and psychological factors and processes into a single unifying framework. The authors hope to engage a broad spectrum of their colleagues in the World Academy of Art & Science, Club of Rome and related organizations in this effort.

## **10. Essential Issues for the New Economics**

1. *Human-centered*: How will a truly human-centered theory reflect the untapped potential for employment generation and wealth-creation inherent in man-made economic systems founded by human beings for the sake of human welfare based on human capabilities and human resources, individual and collective?
2. *Economic Value*: How will our conception and measures of value take into account the risks and uncertainties prevalent in a modern service economy? How will they incorporate a broader conception of capital in measuring wealth-generation and levels of prosperity? How should it take into account the value of non-monetarized and un-monetized economics activities in measuring wealth?
3. *Wealth & Welfare*: What theoretical framework will lead to a system that optimizes the generation of real wealth? How will its principles reflect the primacy of human choice and human welfare? How will it effectively and justly reconcile the rights of the individual with the overall welfare of the social collective and humanity as a whole?
4. *Human Values*: What place will the theory accord to human values in promoting maximum wealth-creation, economic security and welfare for humanity as a whole? How will it take into account the role of equity and inequality in terms of both ethics and social welfare?
5. *Employment*: How will the new economics reconcile optimal efficiency of production with full employment and global labor markets with national-level employment policies? How will it take into account the essential role of employment in ensuring social stability for the collect and fundamental economic rights for the individual? What place is there in a human-centered theory for the premise that employment is a natural right which must be guaranteed? What conceptual and institutional framework would the theory adopt as

the basis for global policies to achieve full employment?

6. *Markets*: What is the rightful place of regulation in the effective functioning of markets to attain maximum wealth-generation and welfare for society as a whole? How can the untapped productive capacity of the global economy be most effectively leveraged to generate higher living standards and welfare for the world's population?
7. *Money*: What is essential basis and backing for money-creation? What role has it played in the evolution of society and economy? What factors determine the ultimate limits to money-creation and how far are they presently being utilized? How can money systems be more effectively utilized to tap unutilized social resources to meet unmet social needs? Which blend of monetarized and non-monetarized activities contributes most positively to wealth-generation and human-welfare?
8. *Financial Markets*: What is the rightful role of financial markets in promoting wealth-generation and human welfare? What place should regulation and speculation find in an optimal system?
9. *Integrated Perspective*: What perspective will the theory utilize to reflect the common underlying social processes that connect and integrate economic, political, social, psychological, technological, organizational and ecological factors in the development and evolution of society?

# The Knowledge Society: A Sustainability Paradigm

Naim Hamdija Afgan and Maria G. Carvalho

Instituto Superior Tecnico, Lisboa, Portugal

## *Abstract*

This paper defines the knowledge society as a human structured organisation based on contemporary developed knowledge and representing new quality of life support systems. It implies the need for a full understanding of distribution of knowledge, access to information and the capability to transfer information into a knowledge. The understanding of knowledge is the central challenge when defining a knowledge society. From our present perception of knowledge society, it is of interest to emphasize the role of the knowledge society in future development of human society. The life support systems are essential pillars of human society development. In this respect knowledge society represents a new paradigm for future development and it is strongly correlated to sustainable development. For this reason the sustainability paradigm of knowledge society is a potential frame for human society development leading to social cohesion, economic competitiveness and stability, use of resources and economic development, safeguarding biodiversity and the ecosystem.

In order to verify the mutual relation between knowledge society and sustainability, we have to introduce the difference between these two terms. The knowledge society is based on the agglomeration of eco-knowledge, env-knowledge and soc-knowledge, it may be evaluated as the complex knowledge of quality of life support systems. We have to introduce metrics which will allow us to present knowledge as the paradigm of the number of indicators for verifying progress made.

Sustainability metrics are designed to consolidate measures of economic, environmental and social performance of any system. It can be understood as a pattern for evaluation of the available knowledge about systems and their performance. In particular the decision-making process for the selection of the system under consideration must be based on the available knowledge. The link between knowledge and sustainability makes it possible for us to visualise that the sustainability paradigm is the essential frame for the knowledge society.

## 1. Introduction

In the Wikipedia encyclopaedia knowledge is defined as “physiological result of perception and learning and reasoning”.<sup>1</sup> In contrast to information, knowledge requires organisational structure of facts with respective attributes reflecting specific properties and processing.

---

<sup>1</sup> Knowledge Society - Wikipedia, free encyclopaedia.

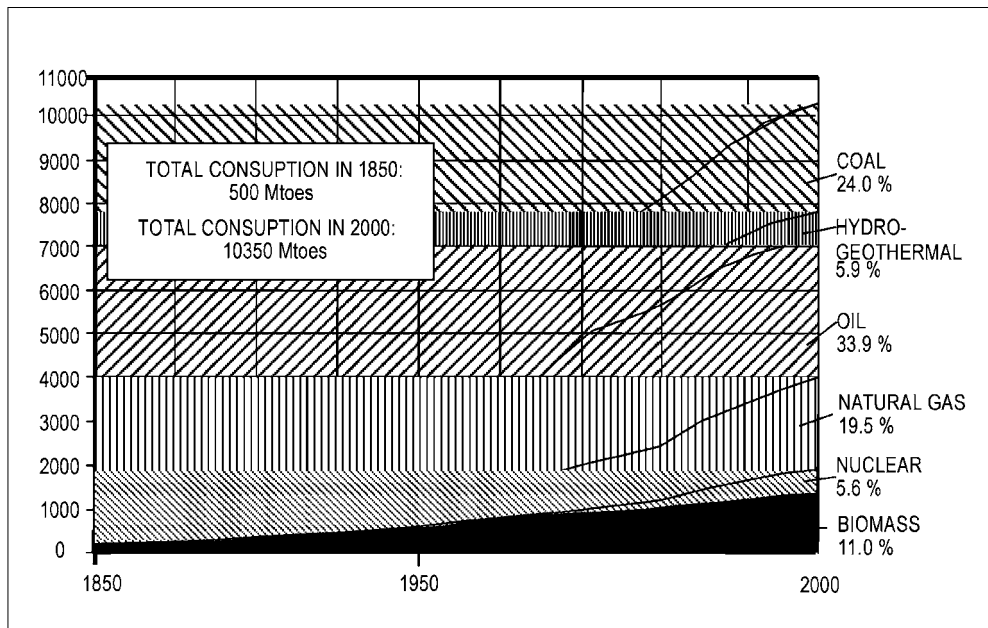
The agglomeration of knowledge is immanent to science and technology development. It represents quality and quantity description and understanding of our perception of material, social and cultural life. The link between different quality of life support systems is essential. Throughout human history the knowledge structure has been formed leading to the formation of its division into the specific branches devoted to individual entities.

With the development of information technology in hardware and software form, a new opportunity was opened for the further systematization and organisation of available knowledge. The knowledge base becomes a powerful tool for knowledge organisation and for making its potential for economic, cultural, and technological development available.

The essential source of knowledge is science. Science from its early days has been focused on the gathering of available knowledge in nature and, through systematic reasoning, on promoting a formation in different areas of science of human interest. Agglomeration of scientific knowledge has introduced the need for its organisation, which in turn has led to the formation of different disciplines and their interdisciplinary and multidisciplinary correlation.

The second phase in knowledge development has been motivated by economic, technological and social need for industrial development. The energy consumption in the world as shown on Figure 1 is a good example of how innovations have contributed to the new quality of life and economic development.<sup>2</sup>

Figure 1: Energy Consumption



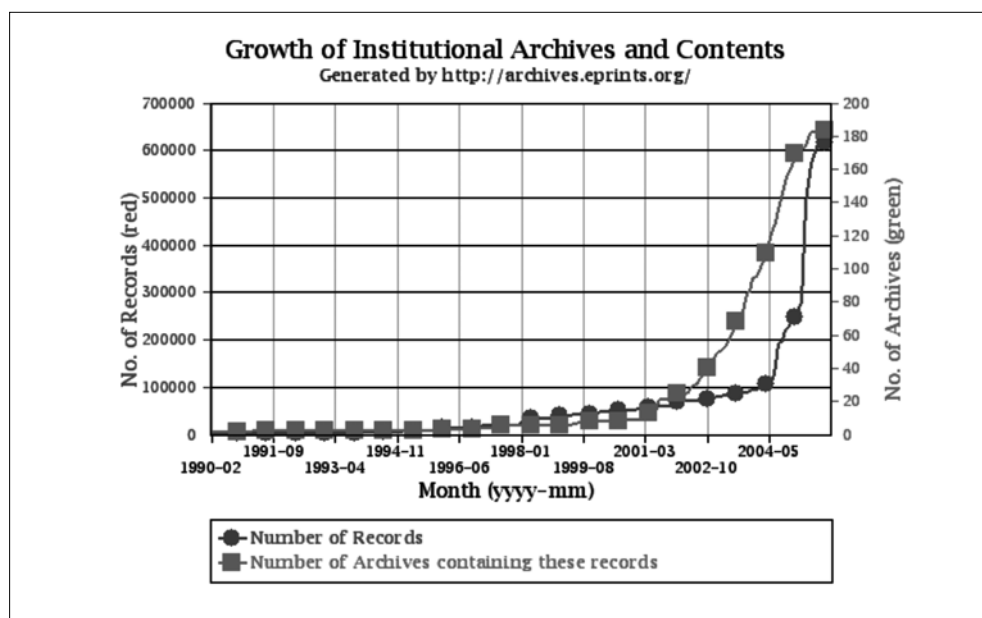
<sup>2</sup> N.H. Afgan, M.G. Carvalho, *Quality, Sustainability and Indicators of Energy Systems*, Begell House Publisher, 2009.

It can be seen that since the beginning of the industrial revolution in 1850 the increase in energy consumption has been the result of the invention of the Watt machine. The second phase found at the beginning of the First World War involves machines resulting from the need for new technologies for war. A similar period occurred at the beginning of the Second World War, which introduced a breakthrough in many scientific disciplines leading to a new quality of life. It should be mentioned here how fission and other nuclear process changed the outcome of the Second World War.

The industrial revolution opened a new era in the promotion of the need for new scientific and technological inventions in order to promote economic, social and cultural development. This period is characterised by an enormous quantity and quality of knowledge which introduced the need for the organisation of the knowledge society to accommodate the further development of human society.

In order to have a deeper insight into knowledge agglomeration we can look at the number of scientific publications as shown by Figure 2.<sup>3</sup>

Figure 2



A sustainable knowledge society has to meet a number of diverse criteria. Among these are: sustainability discourse, economic models, characteristics of the emerging knowledge society. In order to have metrics for these criteria the different indicators are designed capable of identifying the goals of the research agenda. To clarify our understanding of the sustainability of knowledge society it is of interest to define sustainability as the dynamic state of a complex system characterised by the criteria comprising the social, institutional,

<sup>3</sup> Chapter of Civil Right for a Sustainable Knowledge Society, Document of the Heinrich-Böll- Foundation, May 2003.



and environmental contribution to global long term human welfare based on their specific and unique set of inherent goals and functions.<sup>4</sup> The system approach emphasises the interacting characteristics of different facets of human development and how the failure or omission of one function can negatively affect the whole system. Moreover, the system approach comprises a potential possibility of defining the quality of the system.

## 2. Information Society

Within this context, the concept of “information society” as a political and ideological construct has developed under the direction of neo-liberal globalization, whose main goal has been to accelerate the establishment of an open and “self-regulated” world market. This policy has counted on the close collaboration of multilateral organizations such as the World Trade Organization (WTO), the International Monetary Fund (IMF), and the World Bank, in order for the weak countries to abandon national regulations or protectionist measures that “would discourage” the inversion; all with the known result of a scandalous widening of the gaps between the rich and the poor in the World.

In fact, at the end of the century, when the majority of the developed countries had already adopted ICT infrastructure development policies, there is a spectacular peak in the share market of the communications industry. It is within this context that the WSIS is convoked; a panorama that changes, however, when the stock bubble burst as of the year 2000. Regardless of this reality and the key role that communication technologies have played in the acceleration of economic globalization, information society’s public image is more associated with the “friendlier” aspects of globalization, such as the World Wide Web, mobile and international phoning, TV via satellite, etc. Thus, the information society has assumed the role of “good will ambassador” for globalization, “benefits” of which could be within the reach of all, if only the “digital divide” could be bridged.<sup>5</sup>

## 3. Knowledge Society

The knowledge society is a human structured organisation based on contemporary developed knowledge and representing new quality of life support systems. It implies the need to fully understand distribution of knowledge, access to information and capability to transfer information into knowledge. The understanding of knowledge is the central challenge when defining a knowledge society. From our present perception of the knowledge society, it is useful to emphasize the role of the knowledge society in the future development of human society. The life support systems are essential pillars of human society development. In this respect the knowledge society represents a new paradigm for future development and it is strongly correlated to sustainable development. For this reason the sustainability paradigm of the knowledge society is a potential frame for human society development leading to social cohesion, economic competitiveness and stability, use of resources and economic development, safeguarding biodiversity and the ecosystem.

---

<sup>4</sup> Paul A. David and Dominique Foray, Economic Fundamentals of Knowledge Society, *The International Social Science Journal*, No, 171, 2002.

<sup>5</sup> Vision in Progress, World Summit on the Information Society, Geneva, 2003

The knowledge society is based on the need for knowledge distribution, access to information and capability to transfer information into knowledge. Knowledge distribution is one of the essential requirements of the knowledge society. It has to be based on equity and non-discrimination, justice and solidarity. It implies understanding of knowledge as the central pillar of the knowledge society.

Knowledge is more than information. It requires information processing with the specific aim of obtaining the conceptual understanding of life support systems within a specific cultural system. The global validation of information is immanent to the knowledge society. So, access to the global information pool is the main driving force for the development of knowledge society.

The capacity for information transformation into knowledge is represented by the ability of the cultural system to convert available information into scientific and technological values used in everyday life. It strongly depends on the cultural and social system. The notion “knowledge society” emerged toward the end of the 90s and is particularly used, by some in academic circles, as an alternative to the “information society”.

UNESCO, in particular, has adopted the term “knowledge society”, or its variant, “knowledge societies”, within its institutional policies. There has been a great deal of reflection on the issue, which strives to incorporate a more integral conception that is not only related to the economic dimension. For example, Abdul Waheed Khan (general sub-director of UNESCO for Communication and Information) writes: “Information society is the building block for knowledge societies<sup>6</sup>. Whereas I see the concept of ‘information society’ as linked to the idea of ‘technological innovation’, the concept of ‘knowledge societies’ includes a dimension of social, cultural, economical, political and institutional transformation, and a more pluralistic and developmental perspective. In my view, the concept of ‘knowledge societies’ is preferable to that of the ‘information society’ because it better captures the complexity and dynamism of the changes taking place. (...) the knowledge in question is important not only for economic growth but also for empowering and developing all sectors of society.”

A nuance in this debate, which only concerns the Roman languages, is the distinction between “sociedad del conocimiento” and “sociedad del saber” (which both translate as “knowledge society” in English). The notion “saberes” implies more precise or practical certainties, while “conocimiento” encompasses a more global or analytical comprehensiveness. André Gorz considers that “conocimientos” refer to “formalized targeted contents, which cannot, by definition, belong to people...” “Saber” consists of experiences and practices that have become intuitive evidence and customs.<sup>7</sup> For Gorz, “intelligence” covers the whole range of capacities that allow combining “saberes” with “conocimientos”.

He then suggests that “knowledge society” be translated as the “intelligence society”. In any case, in general, within this context the terms “sociedad del conocimiento” and “sociedad del saber” are used interchangeably, although, at least in Spanish, “conocimiento” seems to be more common than “saber”.

The role of knowledge society in contemporary life depends on the level of the new development of the science and technology. With cognitive science the modern society will reach its essential level, giving opportunity to the public at large to take advantage of the knowledge society development.

---

<sup>6</sup> Sally Burch, *The Information Society - The Knowledge Societies*, World Matters, 2005.

<sup>7</sup> Abdul Waheed Khan, UNESCO Assistant Director-General for Communication and Information UNESCOs Basic Text on the Information Society, UNESCO Publishing, 2005.

## 4. European Knowledge Society

The diversity of European cultures is based on history and exchange and mutual learning.<sup>8</sup>

*“The past 50 years have seen extraordinary progress for Europe. However challenges of globalisation and the competitive challenge from the United States and from the emerging economies such as China and India have placed new threats to Europe. Five years ago the European Union launched an ambitious agenda for reform leading Europe to become the most dynamic and competitive knowledge based economy in the world capable of sustainable economic growth with more and better jobs and great social cohesion, and respect for the environment. Over the last year the Commission has been reviewing the progress made in the Lisbon Process. There is a general consensus that Europe is far from achieving the potential for change that the Lisbon strategy offers. The European Union has almost 20 million unemployed people, an ageing population and youth social exclusion. Europe’s performance has diverged from that of our competitors in other parts of the world. Their productivity has grown faster and they have invested more in research and development.*

*Europe still needs a vision for society which can integrate both the ageing and the young for the development of both long-term growth and social cohesion. We need a dynamic economy to catalyse our social and environmental ambitions. This is why the Commission proposes a new start for the Lisbon Strategy, focusing efforts in lasting growth and creating more and better jobs, setting priorities which will help the Union and the Member States to focus, such as:*

- *Making Europe a more attractive place in which to invest and work*
- *Knowledge and Innovation for growth*
- *Creating more and better jobs.”*

## 5. World Knowledge Society

The world knowledge society reflects the human capital generated in the form which is quantified as economic knowledge, environmental knowledge and social knowledge. In this respect human capital comprises wholeness of the life support systems. Economic knowledge is at the heart of economic growth and the gradual rise in levels of social well-being. The ability to invent and innovate, which is to create new knowledge and new ideas that are then embodied in production, processes and organisation has always served as the bases for future development. The knowledge-based economy is a recently coined term. As such, its use is meant to signify a change of economy from an earlier period to the present day.

Environmental knowledge represents the agglomerated knowledge of human environment development. It comprises the collection of historical data decrying world climate changes through the history of our planet. Besides following the changes of planetary history environment knowledge is one of the essential knowledge pillars for understanding the creation and development of life on our planet. In this respect the world agglomerated environmental knowledge is the basis for learning about our past and future.

---

<sup>8</sup> Maria da Graça Carvalho, *Building Europe Of Knowledge, Invited Lecture*, International Conference of World Academy of art and Science, Zagreb, 2005.

Social knowledge is a term describing human history. It follows the knowledge of different levels of the social well being structure and its transformation through history.

## **6. Sustainability Paradigm**

Sustainability is a notion which comprises the multi-criteria validation of the system. Sustainability is a metric of the quality of human life. It includes economic, environmental and social validation. It is understood that no generation will indebt any future generation's comfort.

Sustainable development encompasses economic, social, and ecological perspectives of conservation and change. In correspondence with the WCED, it is generally defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This definition is based on the ethical imperative of equity within and between generations. Moreover, apart from meeting the basic needs of all, sustainable development implies sustaining the natural life-support systems on Earth, and extending to all the opportunities to satisfy their aspirations for a better life. Hence, sustainable development is more precisely defined as 'a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations.

This definition involves an important transformation and extension of the basic concept of physical sustainability to the social and economic context of development. Thus, terms of sustainability cannot exclusively be defined from an environmental point of view or based on attitudes. Rather, the challenge is to define operational and consistent terms of sustainability from an integrated social, ecological, and economic system perspective. This gives rise to two fundamental issues that need to be clearly distinguished before integrating normative and positive issues in an overall framework.

Sustainability provides a framework for integrating economic, environmental and social interests into effective strategy. For life support systems that recognise the need to embrace sustainable development the first step is to understand how to implement it. Putting this concept into operation requires identifying practical indicators of sustainability and understanding how it can be measured over time to determine if progress is made.

## **7. Knowledge Society and Sustainability Metrics**

In order to verify the mutual relationship between knowledge society and sustainability, we have to consider the difference between these two terms. Since, knowledge society is based on the agglomeration of eco-knowledge, env-knowledge and soc-knowledge, it may be evaluated as the complex knowledge of quality of life support systems. In order to do so, we have to introduce metrics which will allow us to present knowledge as the paradigm of the number of indicators to verify whether progress is made.<sup>9</sup>

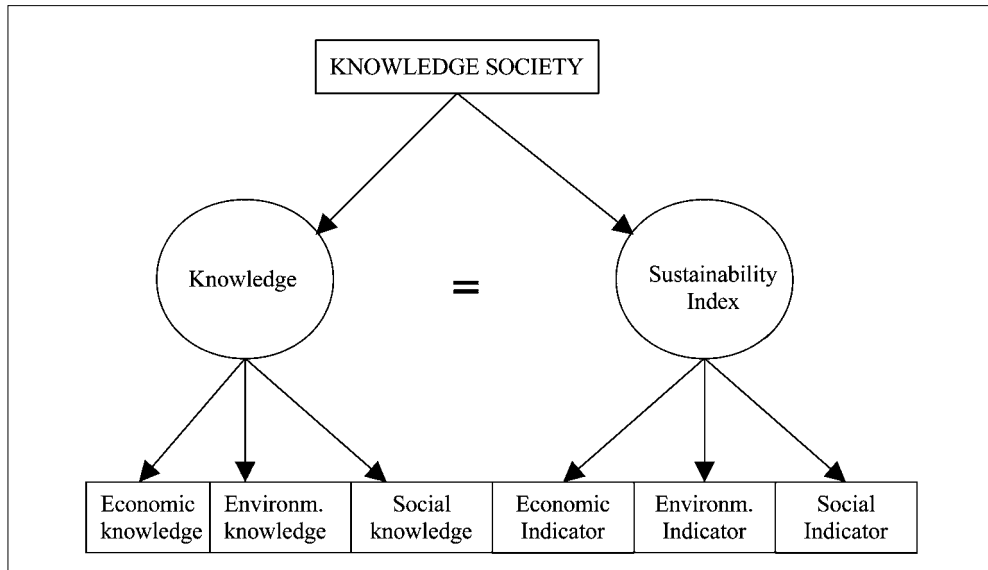
Sustainability metrics are designed to consolidate measures of economic, environmental and social performance of any system. It can be understood as a pattern for evaluation of

---

<sup>9</sup> Afgan N.H, Carvalho M. G., *Sustainability Assessment Method for Energy Systems*, Kluwer Academic Publisher, New York, 2000.

the available knowledge about a system and its performance. In particular the decision-making process for selection of the system under consideration must be based on available knowledge. The link between knowledge and sustainability makes it possible to visualise that the sustainability paradigm is the essential frame of the knowledge society.

*Figure 3: Knowledge and Sustainability Index*



Since every life support system requires knowledge about its structure, efficiency, operation and maintenance, it is immanent to the knowledge base of the respective system to be organised as the object oriented system. Also, the sustainability of the same system is described by the appropriately selected criteria and corresponding indicators organised in the appropriate paradigm describing its functionality. The mutual relation between knowledge and sustainability reveals the possibility of anticipating the knowledge society as a sustainability paradigm. As shown on Figure 3 the knowledge society is organised as the equity between the knowledge and sustainability index. These are structured with economic knowledge, environmental knowledge and social knowledge of the system. The Sustainability Index is composed of economic indicators, environmental indicators and social indicators as the basic indicators of sustainability, including material intensity, energy intensity, water consumption, toxic emission and pollutant emission. Complementary metrics within each of these categories can be developed as support for the need for the knowledge about area decision.

## 8. Sustainability Index

Sustainability measurement is characterised by the evaluation of the different qualities of the system. In this respect the quality parameters are defined by appropriate indicators made up of different scales for measurement. It can be numerical value of the specific physical

parameter, monetary value, non-dimensional qualitative characteristic or specific sign. All these parameters are given in their own scale, so it is necessary to form a membership function for every parameter to be taken into consideration for the assessment of Sustainability Index.

This step consists in the formation of particular membership functions  $q_1(x_1), \dots, q_m(x_m)$ . For every Indicator  $x_i$  we have: (1) to fix two values  $MIN(i)$ ,  $MAX(i)$ ; (2) to indicate is the function  $q_i(x_i)$  decreasing or increasing with argument  $x_i$  increasing; (3) to choose the exponent's value  $\lambda$  in the formula

$$q_i(x_i) = \begin{cases} 0, & \text{if } x_i \leq MIN(i), \\ \left( \frac{x_i - MIN(i)}{MAX(i) - MIN(i)} \right)^\lambda, & \text{if } MIN(i) < x_i \leq MAX(i), \\ 1, & \text{if } x_i > MAX(i) \end{cases}$$

or the increasing function  $q_i(x_i)$ .

The functions  $q_1(x_1), \dots, q_m(x_m)$  formation process being finished with a matrix  $q_j^{(i)}$ ,  $i=1, \dots, m$ ,  $j=1, \dots, k$ , where an element  $q_j^{(i)}$  is a value of  $i$ -th particular criterion for  $j$ -th option. In this analysis it assumed that the linear functions are used. For  $q_1$ ,  $q_2$  and  $q_4$  membership function  $q_1(x_1), \dots, q_m(x_m)$  the decreasing function are adapted.

Sustainability Index comprises a formation of an aggregative function with the weighted arithmetic mean as the synthesizing function defined as

$$Q(q; w) = \sum_{i=1}^m w_i q_i$$

where

$w_i$  — weight-coefficients elements of vector  $w$   
 $q_i$  — indicators of specific criteria

In order to define weight-coefficient vector the randomization of uncertainty is introduced. Randomization produces stochastic with realizations from corresponding sets of functions and a random weight-vector. It is assumed that the measurement of the weight coefficients is accurate to within a step  $h = 1/n$ , with  $n$  as a positive integer. In this case the infinite set of all possible vectors may be approximated by the finite set  $W(m,n)$  of all possible weight vectors with discrete components.

For non-numeric, inexact and incomplete information  $I = OI \cup II$  is used for the reduction of the set  $W(m,n)$  of all possible vectors  $w$  to obtain the discrete components set  $W(I;n,m)$  is defined a number of constraints reflecting non-numeric information about the mutual relation among the criteria under consideration.

## 9. Knowledge Society Objectives

Economic development basically depends on knowledge availability. Globalisation and new information and communication capabilities provide opportunities as well as challenges

for the sustainable consumption and production pattern. In this respect ICT is the modern driving force for economic development. New science breakthroughs and a technology driven pattern of innovation are the basic platform for economic development. It should be taken into a consideration that the achievements in science and technological innovations will not automatically bring about social, environmental and economic improvements. Besides these important elements for economic development new models such as equity, justice and non-discrimination are needed.

The development of the Knowledge Society is focused on the following objectives:

- To inspire and enable individuals to develop their capability to the highest potential level throughout life, so they can grow intellectually, be well equipped for work, can contribute effectively to society and enjoy active personal fulfilment.
- To increase knowledge and understanding for their application at local, regional, national level.
- To play a major role in shaping a democratic, civilised and intellectual society.
- To promote the exchange of ideas for the development of the knowledge society and merge joint activities devoted to the future development of life support systems.
- To learn, evaluate, assess and validate economic, environmental, social and technological advancement to produce benefits based on the knowledge society.

It is of paramount importance for world, regional and state economic development to have broad access to the modern knowledge bases. In this respect it is immanent to the utilization of knowledge bases to have appropriate knowledge distribution systems. The education system is the basic means in the dissemination of knowledge. Close links between knowledge bases and education system promote knowledge transfer to all levels of human organisation.

The essential component in invention and innovation is knowledge. The transfer and dissemination of knowledge increase ability to invent and innovate, that is to create new knowledge and new ideas that are then embedded in production, processes and organisation. Organisations and institutions capable of the creation and dissemination of knowledge are always part of the education system.

The knowledge economy and society stem from the combination of four interdependent elements: the production of knowledge, mainly through scientific research; its transmission through education and training; its dissemination through information and communication technologies; its use in technological innovation. At the same time, new configurations of production, transmission and application of knowledge are emerging, and their effect is to involve a greater number of players, typically in an increasingly internationalised network-driven context.

## **10. Education System**

Education for sustainable development is a) teaching basic reading, writing and arithmetic skills to all, b) convincing people why they should not pollute, c) developing knowledge, skills and programmes that will end poverty for good, d) learning how to make decisions for the good of the whole community.

### *10.1 The Role of Universities in Europe in Generating Knowledge*

The emerging knowledge society has increased the priority of education and learning in society. The Lisbon summit in 2000 set the objectives of creating the most cooperative knowledge based economy in the world by 2010. In order to promote, support and organise activities leading to the development of the knowledge society, the organisation of platforms for a dissemination, transfer and utilisation approach, for society as a whole, of education and teaching of essential knowledge in support of a new social structure based on the new quality of life is of paramount importance.

Universities are situated at the crossroads of research, education and innovation. In many respects they hold the key to the knowledge economy and society. They play an important role in the creation of the knowledge society. Besides their classical role as educational institutions, they are now a pool of knowledge and research institutions for knowledge generation. Close links between society and universities has generated interaction that proves to be an essential force in development. In addition, universities train an ever increasing number of students with increasingly higher qualifications, and thus contribute to strengthening the competitiveness of the European economy: one third of Europeans today work in highly knowledge intensive sectors (over 40% in countries like Denmark and Sweden).

Universities also contribute to the other objectives of the Lisbon strategy, particularly employment and social cohesion, and to the improvement of the general level of education in Europe. Many more young Europeans have a higher education qualification today than in previous generations. While some 20% of Europeans aged between 35 and 39 hold such qualifications, this figure is a mere 12.5% for the 55-59 age group. If we look at the total population aged 25-64, the rate of employment of persons holding higher education qualifications stood at 84% in 2001, i.e. almost 15 points above the average when taking all education levels together, and nearly 30 points more than people who have completed only lower secondary level. Finally, the rate of unemployment amongst those holding higher education qualifications stood at 3.9% in 2001, one third of that of persons with a low level of qualification.

However, at present 80 million citizens of the Union are low skilled. This is over 30% of the workforce. However, by 2010 only 15% of all jobs will be available to people with only basic schooling. Better skills will help people find better jobs. More importantly, however, a better-skilled worker will be a more active member of the community.

### *10.2 Increased Demand for Higher Education*

While Europe is certainly a highly educated society, only 21% of the EU working-age population has achieved tertiary education, significantly lower than in the US (38%), Canada (43%) Japan (36%) and South Korea (26%).

This will continue to be the case in the years ahead, spurred on simultaneously by the fact that certain countries have the objective of increasing the number of students in higher education and by new needs stemming from lifelong learning.

The increasing demand has to be met, finding solutions to the limits in human resources and financial capacity. It is crucially important to maintain and strengthen the excellence of teaching and research, without compromising the level of quality offered, while ensuring broad, fair and democratic access.



## 11. Future Strategy of Knowledge Society Development

Doubtlessly the knowledge society will focus its attention on the development of the sustainability concept as the future strategy for its development. As mentioned in a number of sustainability definitions, the concept of the future development of our world has to be based on philosophical issues involving ethical, religious, political and economic principles.

The definition of the sustainability concept involves an important transformation and extension of the ecologically-based concept of physical sustainability to the social and economic context of development. Thus, terms of sustainability cannot exclusively be defined from an environmental point of view or attitude. Rather, the challenge is to define operational and consistent terms of sustainability from an integrated social, ecological, and economic system perspective. The weak and strong sustainability concept are discussed in this light.

Over a number of recent years “sustainability” has become a popular buzzword in the discussion on the use of resources and environment policy. Before any further discussion on the subject, it is necessary to define and properly assess the term we are going to use. So, what is sustainability? Among the terms most often adopted are the following:

- a) for the World Commission on Environment and Development (Brundtland Commission)<sup>10</sup>

*“development that meets the needs of the present without compromising the ability of future generation to meet their own needs”*

- b) for the Agenda 21, Chapter 35<sup>11</sup>

*“development requires taking long-term perspectives, integrating local and regional effects of global change into the development process, and using the best scientific and traditional knowledge available”*

- c) for the Council of Academies of Engineering and Technological Sciences (Declaration of the Council Engineering and Technological Sciences, 1995)<sup>12</sup>

*“It means the balancing of economic, social, environmental and technological consideration, as well as the incorporation of a set of ethic values”*

- d) for the Earth Chapter (The Earth Chapter, 1995)<sup>13</sup>

*“The protection of the environment is essential for human well-being and the enjoyment of fundamental rights, and as such requires the exercise of corresponding fundamental duties”*

- e) Thomas Jefferson, Sept.6 1889 (Jenkinson, C.S., 1987)<sup>14</sup>

*“Then I say the earth belongs to each generation during its course, fully and in its right no generation can contract debts greater than may be paid during the course of its existence”*

---

<sup>10</sup> Report of The United Nations Conference on Environment and Development, Vol. 1, Chapter 7, June, 1992.

<sup>11</sup> Agenda 21, Chapter 35, Science for Sustainable Development, United Nations Conference on Environment and Development, 1992.

<sup>12</sup> Declaration of the Council of Academies of Engineering and Technological Sciences.

<sup>13</sup> *The Earth Chapter : A Contribution Toward its Realization*, Franciscan Center of Environment Studies, Roma, 1995.

<sup>14</sup> C.S. Jenkinson, *The Quality of Thomas Jefferson's Soul*, White House Library.

All five definitions stand for the emphasis on specific aspects of sustainability.

Definitions a) and e) imply that each generation must bequeath enough natural capital to permit future generations to satisfy their needs. Even if there is some ambiguity in this definition, it means that we should leave our descendants the ability to survive and meet their own needs. Also, in what form resources are to be left and how much is needed for the future generation is not specified, because it is difficult to anticipate future scenarios.

Definitions b) and c) are more political and imply that actions should be taken at global, regional and local levels in order to stimulate the United Nations, Government and Local Authorities to plan development programs in accordance with scientific and technological knowledge. In particular in definition c) the ethical aspect of future actions to be taken to meet sustainable development is to be noted.

Definition d) is based on religious beliefs playing, as it does, on the responsibility and duties toward nature and the Earth. In this respect it is of interest to mention that the Old Testament, in which the story of creation is told, is a fundamental basis for Hebrew and Christian doctrine on the environment. In the world of Islam, nature is the basis for human consciousness. According to the Koran, while humankind is God's vice-regent on Earth, God is the Creator and Owner of nature. But human beings are his trusted administrators, and ought to follow God's instructions, that is, acquiesce to the authority of the Prophet and the Koran regarding nature and natural resources.

If it is assumed that our future society will be based on the sustainability concept, it is immanent to it that it has to comply with strong ethical values.

### *11.1 Contemporary World and Knowledge Society*

The contemporary world is characterised by a number of attributes, including: increase of population, increase of wealth, increase in consumption, increase of poverty, increase of knowledge, development of information and communication technology, development of education systems, new health protection systems, higher treatment of hazard and safety. All these elements are comprised in knowledge bases which represent an agglomeration of the total knowledge of the world.

The knowledge society is an organised association of people with similar interests, who try to make effective use of the vast wealth of knowledge in their specific areas of interest. It reflects the present level of social structure and the need for its future development

## **12. Conclusion**

By definition the knowledge society has introduced a new human system pattern. This comprises the agglomerated knowledge accumulated through our planet's history. With the strong development of information and communication technology it has been possible to create a knowledge dissemination system which promotes the extended use of new inventions and innovations in the production of new products, organisations and quality of life support systems.

Sustainability as the new definition suggests, is about the need on the part of human society to comply with the limits to our planet's resources. It is aimed at imposing the need

for every generation to balance the use of economic, social, environmental and technological means with a set of ethical values.

One of the essential pillars of the knowledge society is education. It is recognised that this platform for the development of the knowledge society is the essential support for building a new social structure based on a new quality of life.

The development of European knowledge society so far is proof that Europe still needs a vision for a society that can integrate both the ageing and the young for the development of both long-term growth and social cohesion.

## REFERENCES

- Abdul, W.K. (2005): UNESCO Assistant Director-General for Communication and Information UNESCOs Basic Text on the Information Society, UNESCO Publishing.
- Afgan N.H and Carvalho M.G. (2000): *Sustainability Assessment Method for Energy Systems*, Kluwer Academic Publisher, New York.
- Afgan N.H and Carvalho M.G. (2009): *Quality, Sustainability and Indicators of Energy Systems*, Begell House Publisher.
- Agenda 21, Chapter 35, Science for Sustainable Development, United Nations Conference on Environment and Development, 1992.
- Chapter of Civil Right for a Sustainable Knowledge Society, Document of the Heinrich-Böll-Foundation, May 2003.
- Jenkinson, C.S., *The Quality of Thomas Jefferson's Soul*, White House Library.
- Knowledge Society - Wikipedia, free encyclopaedia.
- David P.A. and Foray, D. (2002): *Economic Fundamentals of Knowledge Society*, *The International Social Science Journal*, No, 171.
- Vision in Progress, World Summit on the Information Society, Geneva, 2003.
- Burch, S. (2005): *The Information Society/The Knowledge Societies*, World Matters.
- Carvalho, M.G. (2005): *Building Europe Of Knowledge, Invited Lecture*, International Conference of World Academy of art and Science, Zagreb.
- Report of The United Nations Conference on Environment and Development, Vol.1, Chapter 7, June, 1992.
- Declaration of the Council of Academies of Engineering and Technological Sciences.
- The Earth Chapter: A Contribution Toward its Realization*, Franciscan Center of Environment Studies, Roma, 1995.

## **Theory & Strategies for Full Employment**

### **Proceedings of the World Academy of Arts & Sciences Conference on the Global Employment Challenge**

**Ashok Natarajan**, GEC Conference Co-chair;  
Secretary, The Mother's Service Society, India

#### **1. The Need for New Theory and Strategies**

From October 2009 to March 2010, the World Academy of Art & Science launched an e-conference on the Global Employment Challenge (GEC). The conference included video webcast presentations and formal papers by innovative thinkers combined with open discussion between Fellows of the Academy and invited guests. The GEC documented the dire need for new thinking and action to address the pressing problem of unemployment in the world today. The recent international financial crisis has thrown into stark relief serious deficiencies with prevailing theories that advocate macro-economic stimulus as the principal policy instrument available for creating new jobs. Applying conventional economic analysis, policies and public programs, the leading economies of the world have expended a few trillion dollars over the past year to offset the economic impact of financial collapse and stimulate employment generation through economic growth.

In spite of this unprecedented expenditure, today a record high 212 million people are without jobs globally, according to official ILO figures.<sup>1</sup> This figure grossly underestimates actual unemployment and underemployment worldwide, which leaves more than three billion people living on incomes of less than \$2.50 a day and unable to meet even their minimum economic needs. Even in economically advanced nations, huge numbers of people — most especially youth — are unable to find remunerative employment. According to webcast presenter Randall Wray, the actual level of unemployment and underemployment in the USA is approximately 17.5% of the work force, representing some 25 million people.<sup>2</sup> He foresaw nearly a year ago what has become much more apparent since then; namely, that it may take 5 to 10 years before unemployment levels in the USA return to pre-crisis levels. Similar conditions persist in most OECD countries. Real unemployment rates in many countries are at least twice the official figures, which do not account for those who have given up seeking work.

The financial crisis has aggravated the global employment problem, but the problem itself precedes and will persist long after the world economy recovers from the recent downturn. Even before the onset of the crisis, levels of unemployment were unconscionably high in many countries. In 2005, unemployment was 18% in Spain, Poland and East Germany, more than 15% in Croatia and Slovakia, and 30% to 95% throughout most of Africa. Especially troubling

---

<sup>1</sup> ILO, *Global Employment Trends 2010*.

<sup>2</sup> Wray, Randall, "Full Employment Through Direct Job Creation", webcast presentation to the World Academy of Art & Science, November 10, 2009, <http://www.worldacademy.org/files/Job%20Guarantee%20Wray%20presentation%20on%20Nov%2010%2009.pdf>.

is the high youth unemployment rate, e.g. around 35% in Poland, Croatia and Slovakia, 30% in Italy and Greece, 20-25% in France and Spain. The reliance on massive public expenditure to stimulate job creation has not only proven inadequate, but also threatened the financial stability of countries such as Greece, Spain and Portugal who thought they could afford it.

In spite of these bleak figures, the presentations and discussions that have taken place during the GEC indicate that long term trends support the view that full employment is an achievable goal and that other strategies do exist that are capable of generating full employment nationally and globally.<sup>3</sup> In order to generate the confidence needed for widespread adoption, these alternative approaches require the support of theoretical backing and practical evidence. The GEC called for the formulation of new research to identify and document alternative approaches backed by valid theory for achieving the goal of full employment.

## **2. Necessity of Full Employment**

One of the central themes that emerged from the GEC is the necessity of recognizing employment as a fundamental human right and the responsibility of governments to take all possible steps to achieve and maintain full employment. The right to employment is supported both by idealistic as well as practical considerations. In a world in which individual citizens are expected to provide for their own economic livelihood and that of their families, access to employment is an absolute necessity for physical survival and human welfare. Economy is a social organization created by human beings to meet human needs and human welfare. Any theory which purports to represent sound economics must provide a viable means for all members of society to acquire at least the minimum (why not the optimum?) level of purchasing power needed for survival, development and full enjoyment of their human potential. If economic systems based on current theory are unable to provide sufficient employment opportunities, it means either the prevailing theory or its application is deficient.

A few centuries ago that vast majority of the world's population lived on the land and eked out a subsistence level existence from their own physical labor. This is no longer the case. As Winston Nagan observed in his paper, society has become so structured and economy so specialized that today the vast majority of human beings are dependent on employment outside the home for their survival and welfare.<sup>4</sup> Government policies, laws and regulations permeate virtually every aspect of modern economic and social life, effectively determining what types of activity can and cannot be carried out and thereby directly or indirectly determining the number and type of employment opportunities available to the population. Principles of justice necessitate that a government which interferes with economic activity in order to protect the rights of some must ensure conditions that support the basic economic rights of all its citizens. Guaranteeing the right to employment is not only just and necessary; it is also the only effective way to ensure that employment opportunities are available to all citizens. A firm commitment of governments to uphold this right will generate the political will required to achieve it.

---

<sup>3</sup> Jacobs, Garry, "The Global Job Machine: Trends & Prospects", the World Academy of Art & Science e-conference on Global Employment Challenge, November 2, 2009, <http://www.worldacademy.org/forum/global-job-machine>.

<sup>4</sup> Nagan, Winston, "Human Rights and Employment", the World Academy of Art & Science e-conference on Global Employment Challenge, October 1, 2009, <http://www.worldacademy.org/forum/human-rights-and-employment-winston-nagan>.

### 3. New Theoretical Perspectives

The problem of unemployment poses a serious challenge to both economic theorists and policy-makers, because it calls into question the efficacy of the market-place as a means for achieving optimal human welfare. Today we face a situation in which high levels of unemployment coexist together with a high level of unmet social needs. Hundreds of millions of people want to work, but are unable to find employment opportunities. At the same time, billions more struggle to survive in dire poverty. There is something seriously amiss with a system that keeps people idle while essential work remains undone, which is akin to letting food rot while people are starving.

Identification of potential or proven employment generating strategies by itself may not be sufficient to bring about their rapid, widespread implementation around the world. Existing economic theory and conventional policy measures are deeply entrenched among academics and policy-makers. Therefore, it is necessary to re-examine the underlying theoretical framework that supports prevailing practices to show that it is both incomplete and insufficient to fully address the employment problem. In a report to the Club of Rome, Orio Giarini and Patrick Liedtke document the insufficiencies in current employment theory.<sup>5</sup> It is equally necessary to evolve a more comprehensive theoretical framework that reflects the true role of various parameters in the generation of new employment opportunities.

One basic limitation with existing theory is that it continues to be based on the nation-state as the unit for economy and employment generation at a time when employment markets are becoming increasingly regional and global in nature. The phenomenal four-fold multiplication of world trade since 1990 has largely internationalized the labor market for manufacturing jobs. The rapid development of the internet is having a similar impact on employment in IT, business outsourcing, financial services, publishing and many other fields. Increasing corporate mobility is moving jobs to underutilized, lower priced labor markets. Combined with regional integration and demographic changes arising from an aging population in Europe, as well as large scale migration of technically qualified manpower from developing countries, these factors are reducing the capacity of national level theory and policy to effectively deal with an increasingly globalized issue.

Why can we not devise an economic system in which everyone that is willing to work and capable of productive activity is assured of an opportunity and means to do so? It is not as if all possible human wants are already being met and there is no further work to be done in the world. Since at least half the world's population is still living in poverty, there is obviously a great deal of work that is not getting done, work that can build houses, produce goods, provide services and raise all human beings to the level of the middle class. Even in the most economically advanced nations, there are a wide range of human needs and aspirations that are only poorly or partially fulfilled by the current system. Human beings everywhere want better healthcare, more and better education, improved housing and public infrastructure, etc. Why is society unable to meet all or a much larger portion of those needs when there are so many people willing and capable, but unable to find opportunities for gainful employment?

These questions point to a still more fundamental deficiency with current theory arising from the fact that it views economy in isolation from the society of which it is a part. At any point in time society taps only a tiny portion of its creative potential. Society evolves

---

<sup>5</sup> Giarini, Orio and Patrick Liedtke, *The Employment Dilemma: The Future of Work*, Club of Rome, 1997, p. 60-61. <http://eng.newwelfare.org/2006/10/21/abstracts-from-the-employment-dilemma-and-the-future-of-work/>

by developing new ideas, organizations, systems, needs and ways of life. Economic growth arises as a natural result of social development and social evolution. Society is a field for interaction between people. Social potential is created by forging new and more effective ways for people to interact. Four social institutions — language, roads, cities and money — formed the basis for the evolution of civilization over thousands of years. Today our capacity for constructive interaction has multiplied a thousand-fold, yet we have only begun to understand how to utilize that greater potential.

The strategies discussed above barely scratch the surface of the potential, much of which is too intangible to quantify but nonetheless very real and powerful. Can we truly assess the social potential created by the fact that 1.7 billion human beings are now connected over the Internet in a single social system that has the potential to deliver world-class education to everyone, or that 350 million of them participate in a single social networking system, Facebook? We need only imagine the constraints we would face if only 5 or 10% of humanity were accessible by roads, mail services or airlines. Imagine the difficulties we would encounter if the world today lacked English as a common language for communication or if it lacked a mechanism for converting money from one national currency into another. We have hardly begun to fathom the social potential generated by linking a very large portion of humanity to a single system for communication, commerce, education, employment, entertainment and other social interactions.<sup>6</sup> A more comprehensive and integrated social theory of employment will provide the essential foundation for more comprehensive and effective practices. It is necessary to examine existing perspectives and seek to evolve a more inclusive theoretical framework that more effectively harnesses unutilized social potential to fulfill unmet social needs.

## 4. Available Tools for Full Employment

The GEC has explored a number of promising strategies that can be adopted individually or in combination to achieve full employment. Each of these strategies needs to be carefully evaluated to document their feasibility for application under a range of different economic conditions and in order to develop a set of best practices applicable at different levels in different parts of the world.

### 4.1 Job Guarantee Programs

Job guarantee programs range from the temporary Jefes project operated by Argentina to India's National Rural Employment Guarantee Scheme which presently guarantees 100 days of employment per year to more than 45 million families. Randall Wray<sup>7</sup> and Rania Antonopolous<sup>8</sup> presented compelling evidence to show that government-sponsored

---

<sup>6</sup> Jacobs, Garry, "From Newtonian Economics to Full Employment", the World Academy of Art & Science e-conference on Global Employment Challenge, January 11, 2010, <http://www.worldacademy.org/forum/newtonian-economics-full-employment>.

<sup>7</sup> Wray, Randall, "How to Implement True, Full Employment", the World Academy of Art & Science e-conference on Global Employment Challenge, November 14, 2009, <http://www.worldacademy.org/forum/how-implement-true-full-employment-randall-wray> and Full Employment and Employment Guarantees, webcast presentation to the World Academy of Art & Science, November 10, 2009, <http://www.worldacademy.org/content/gec-webcasts#randall>.

<sup>8</sup> Antonopoulos, Rania, "Impact of Employment Guarantee Programmes on Gender Equality and Pro-Poor Economic Development", *POLICY BRIEF*, Case-Study on South Africa, January 2008, [http://www.levy.org/pubs/UNDP-Levy/South\\_Africa/Policy\\_Brief\\_EPWP\\_South\\_Africa.pdf](http://www.levy.org/pubs/UNDP-Levy/South_Africa/Policy_Brief_EPWP_South_Africa.pdf) and Employment Guarantee Policies: Contributing to Pro-Poor Development, Promoting Gender Equality, webcast presentation to the World Academy of Art & Science, February 11, 2010, <http://www.worldacademy.org/content/gec-webcasts#rania>.

employment guarantee programs of this type are a viable option for addressing unemployment in a wide range of developed and developing countries. Wray also observed that the social costs of high unemployment in terms of loss of human capital, poverty, social isolation, crime, regional deterioration, health issues, family breakdown, school dropouts, social, political and economic instability, violence, ethnic hostility, and even terrorism far outweigh the cost of public jobs programs capable of generating full employment.

#### 4.2 Complementary Currencies

At the height of the Great Depression, an experimental currency introduced in the town of Woergl, Austria wiped out 30% local unemployment in a short time. Today more than 2500 complementary or local currencies are being utilized by communities, NGOs and corporates around the world to compensate for the inadequacies of national money systems, often with remarkable effectiveness. As we write a plethora of non-national money systems are also gaining currency on the Internet. Yet, mainstream economic theory does not adequately account for the capacity of these supplementary systems to harness unutilized resources to provide for unmet social needs. Nor does it help us assess the ultimate potential for creating innovative monetary systems. Bernard Lietaer has described a variety of innovative currency programs that can be adopted by countries, states, regions, municipal governments, companies or NGOs to effectively supplement that role of national currencies.<sup>9</sup> The GEC recommended a full examination of these programs to identify those best suited for widespread implementation at different levels and under different economic conditions.

#### 4.3 Technological Innovation

For the past two centuries, technology has been a principal engine for economic growth and job creation. Most of the jobs in today's economy are based on technologies that did not exist 50 years ago. A vast majority of them, such as those in information technology, communications, financial services, medicine, aerospace, and consumer electronics are based largely on technology developed in the past 10 to 20 years. R&D is essential for development of new technologies, but technology dissemination and adaptation are equally important for converting new technologies into real jobs. Countless technologies already exist that are either unknown or remain unexploited due to lack of public awareness, proven potential or entrepreneurial initiative. In a report for the Club of Rome, Gunter Pauli has documented 100 proven, ecologically sustainable technologies that have the potential for creating 100 million new jobs within the next 10 years.<sup>10</sup> The GEC identified the need to identify a broad range of commercially viable existing technologies that can be implemented under different conditions in different parts of the world. Filling Skill Shortages.

---

<sup>9</sup> Lietaer, Bernard, *Commercial Credit Circuit (C3): A Financial Innovation to Structurally Address Unemployment*, published in collaboration with STRO, November 15, 2009, <http://www.worldacademy.org/forum/commercial-credit-circuit-c3> and *Innovative Strategies for Financing Full Employment*, webcast presentation to the World Academy of Art & Science, November 20, 2009, <http://www.worldacademy.org/content/gec-webcasts#bernard>.

<sup>10</sup> Pauli, Gunter, "The Blue Economy", the World Academy of Art & Science e-conference on Global Employment Challenge, November 14, 2009, <http://www.worldacademy.org/files/The%20Blue%20Economy%20by%20Pauli%20in%20ODE.pdf> and *The Blue Economy: 10 years, 100 innovations, 100 million jobs*, webcast presentation to the World Academy of Art & Science, November 14, 2009, <http://www.worldacademy.org/content/gec-webcasts#gunter>.



#### *4.4 Filling Skill Shortages*

A shortage of skills is one of the principal reasons for high levels of unemployment. Numerous studies cited confirm that large scale unemployment co-exists alongside high levels of unfilled jobs in both industrialized and developing countries.<sup>11</sup> An article in *Wall Street Journal* in 2007 revealed that there were 600,000 unfilled jobs in Germany, of which 40,000 were jobs for engineers and other skilled people. Another survey revealed that 80% of small firms in Germany find it very difficult to mobilize the skilled labor force that they require. Small manufacturers and building contractors in the USA are among those that report severe difficulty in recruiting skilled workers. A World Bank study of corporations in developing countries found that 50% of them suffered from a shortage of skilled workers. Even countries like India with enormous manpower and training infrastructure suffer from this problem. A mere 5% of India's workforce has received formal vocational training. Skills shortages prevail in a wide range of basic occupational categories such as plumbers, electricians, masons, carpenters, etc. Since in today's world economy jobs move to where skills are available, skill shortages in one place can often be exploited to create employment opportunities. The GEC highlighted the need to identify best practices and effective strategies for identifying and meeting skill shortages.

#### *4.5 Organizational Innovation*

The internet is not merely a technological innovation. It is also a social innovation, which has created the first truly global social system. Social innovations are almost as common as technological ones and equally productive of new employment opportunities. In the mid 1980s, the Government of India introduced an innovative system to increase access to the telephone system at a time when public investment could meet only 33% of demand. A single line of legislation — “If you operate a telephone booth you will earn 20 percent commission” — transformed long-distance telephony in India. Within a few years this unique program created about 600,000 self-employment opportunities and more than a million jobs. In the process, it helped extend telephone access to more than 98% of India's population. A comparative survey of social organizations and systems in different countries can identify hundreds or thousands of social innovations that can spur new job creation.

Organization provides the structural foundation for all economic activity. Markets, money, and banking are organizational innovations that have revolutionized economy and society over the past few centuries. A study conducted by The Mother's Service Society for the International Commission on Peace & Food in 1991 documented the potential for creating 100 million new employment opportunities in India within 10 years by adoption of modern agricultural technology combined with innovative production and marketing organizations.<sup>12</sup> The strategy was formally adopted by the Government of India in 1992. We need to examine a range of organizational innovations that can be widely applied to create new employment and self-employment opportunities.

---

<sup>11</sup> Natarajan, Ashok, “Job shortages or skill shortages?”, the World Academy of Art & Science e-conference on Global Employment Challenge, November 3, 2009, <http://worldacademy.org/forum/job-shortages-or-skill-shortages>.

<sup>12</sup> International Commission on Peace & Food, “Creating 100 Million Jobs in India”, Study conducted by The Mother's Service Society in 1991, published in *Uncommon Opportunities: Agenda for Peace & Equitable Development*, Zed Books, London, 1994, p. 122. <http://www.mssresearch.org/>

#### *4.6 Entrepreneurship*

In spite of the publicity given to the downsizing of many large corporations, the fact is that throughout the world, small and medium size businesses are the major source of new jobs. During the recent recession, total employment among Canada's small firms remained constant, whereas employment among large corporations declined 10%. In India, only about 5% of employment is in the private corporate sector. In the USA, small firms are responsible for 50% of all jobs and 64% of all new jobs created during the past 15 years, including 40% of high tech workers. That is why entrepreneurial and small business development programs and business incubators are so important.

While many countries encourage new business formation, far less attention is given to supporting small businesses after they have been established. Small businesses not only create the most new jobs, but they also destroy the most due to very high failure rates. The US economy creates about 600,000 new small firms each year, but it also loses almost an equal number due to closure and bankruptcy. Only 70% of new firms survive for two years or more and only 51% survive for five years. Many of these firms are started by individuals with little or no managerial training or experience. Unlike countries such as Netherlands, which require entrepreneurs to undergo formal training before starting a business, many small business owners in USA cannot even read a profit and loss statement. Similar conditions exist in developing countries such as India where new business failure rates are extremely high due to lack of entrepreneurial training. Organized training and counseling for such businessmen can considerably reduce business failures and losses. A set of global best practices is needed for the development of new businesses and prevention of business failures.

#### *4.7 Comprehensive Strategies*

These are just a few examples of areas in which untapped social potentials can become the source of new employment and self-employment opportunities on a very large scale. Any of these seven strategies listed above may be sufficient to dramatically reduce unemployment without reliance on the huge levels of government spending required by traditional macro-economic stimulus packages. Yet individual countries may find a combination of strategies the fastest, most cost effective way to achieve full employment. Therefore, the GEC concluded that there is need for the formulation of a comprehensive theory and set of best practices that can be implemented individually or in combination by countries at different levels of development. It is time that we stopped thinking of economic stimulus programs, public investment and tax cuts as the principal means for creating new jobs. Society is a complex and vastly underutilized resource with a virtually unlimited appetite for new and better products and services. In an age when time, money, energy and other natural resources are considered so precious, it is a crime to neglect the most precious and underutilized of all our resources — human beings.

## Human Rights and Employment

**Winston P. Nagan**, Member, Board of Trustees, World Academy of Art & Science;  
Director, Institute for Human Rights, Peace and Development,  
University of Florida, Gainesville, FL, USA

In the development of internationally sanctioned standards for labor and employment there are some threshold considerations that must be taken into account. First, labor and employment rights generally fall within the category of social, cultural and political rights. This is to be distinguished from conventional, civil and political rights. Internationally, the institution which had primary responsibility for developing labor and employment rights has been the International Labor Organization which was founded under the League of Nations and now grandfathered into the UN system. Thus, labor issues were on the international agenda as matters of international concern prior to the development of human rights law under the UN Charter.

In 1948, the Universal Declaration of Human Rights was adopted. Articles 23 and 24 specifically identify and explain the issue of the right to work and employment as human rights from the perspective of the Declaration. These articles are as follows:

*Article 23:*

- “1. Everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment.
2. Everyone, without any discrimination, has the right to equal pay for equal work.
3. Everyone who works has the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection.
4. Everyone has the right to form and to join trade unions for the protection of his interests.”

*Article 24:*

“Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay.”

The specific issue to note is that the Universal Declaration is an instrument of moral and political obligation, but it is not a Declaration that requires legally binding prescription, enforcement and application.

The ILO was an already established institution and it had developed a corpus of treaty law and practice prior to the UN era. The ILO was moved by the principle that “lasting universal peace can be established only if it is based on social justice.” Thus, it saw its mission as establishing social justice standards for all the world’s workers. The ILO therefore institutionally is an institution with a distinct bureaucracy, an established nomenclature, developed constituencies and consistent practices. The ILO did not see it as crucial that

it integrate its approach to the newly developing human rights constituencies. Among the differences was the idea that human rights spokesmen talked of the abuse of individual human rights whereas the ILO emphasized the duties of states. The violation of individual human rights was expressed in terms of the failure to conform to international standards.

An important development occurred in the 1960s when the UDHR served as the foundation for the development of two critically important human rights treaties. One dealt with civil and political rights, the other with economic, cultural and social rights. These two instruments together with the UDHR are generally considered to be an International Bill of Human Rights. These instruments confronted strongly entrenched ideological positions which fed the Cold War. Western industrialized countries favored civil and political rights in part because they were judicially enforceable and essential for democratic political culture. On the other hand, the socialist states of the East took the opposite position. They favored economic and social rights but were not willing to embrace the implications of importing Western democratic principles via an International Bill of Rights. The ILO was in an awkward position politically and in practice, tended to be somewhat more distanced from the developing human rights community.

From a technical perspective, the limitations and objections to economic and social rights were that these were not really rights in a legal sense; they were more closely related to political and economic goals. In this sense, the central decisions about social economic justice were ones that were more suited to the political rather than the legal sphere of government. We should keep in mind that employment and labor rights influence and are influenced by most of the other rights in the International Bill of Rights. For example, on the agenda of the ILO has been such issues as slavery, forced labor, child labor, debt bondage, discrimination (gender and racial), and associational freedoms which include claims to collective bargaining, etc.

The modern view of human rights has generated a consensus that these rights are universal, indivisible, inter-dependent and interrelated. At the UN's 1995 Summit on Social Development, the core labor rights such as freedom of association, the right to organize, and collectively bargain were reaffirmed as fundamental human rights. Development within the ILO was significantly furthered in 1998 when the Conference of the ILO adopted a "Declaration of Fundamental Principles and Rights at Work." These developments do not explicitly articulate the idea of an individual's enforceable human right to employment or the states duty to provide employment or a corporate obligation to do what is possible within sound business practice to avoid unemployment strategies of doing business.

If we conceptualize the right to employment and labor as encapsulated in the value of skill, it is possible to briefly map the way in which skill is a base of power for securing other articulate human rights values. For example, skill in terms of access to power is a base that is critical to the shaping and sharing of power. In this sense, skill is a critical value for protecting human rights interests tied up with the exercise of political power. Similarly, skill is an important base to acquire wealth and related economic values and is therefore critical for economic justice. Skill is also a base for access to education and enlightenment which is central to human development. Skill is also a base for access to health and well being as well as to the institutions of social rectitude. Thus, employment rights including access and performance influence every other human rights value. Similarly, every other human rights value will influence the shaping and the sharing of labor and skill values. With this in mind, we examine the problem of full employment as a human right. It may be at the outset, better to see this in terms of the political will and articulate ideology of the state and state responsibility. From this perspective it is self-evident that governments routinely intervene

in matters that directly affect the economic status of the individual. Such interventions may well influence both quantity of employment opportunities available as well as the nature of these opportunities. Some obvious examples of governmental policy influencing these issues are its role in setting interest rates, its approach to budget deficits, the expansive or restrictive nature of its import and export policy, its tax policies, its military expenditure, its immigration policies, its approach to industrial development, its investment in the society, its licensing policies, its environmental regulations, and a good deal more. One illustration of the way in which an ostensibly neutral tax policy could influence employment patterns is the regulation that provides incentives for capital investment in the form of depreciation while providing disincentives to employment in the payroll tax. This suggests a partiality to investing in technology rather than labor.

To the extent that employment is one of the most important mechanisms for the allocation of purchasing power to the individual, the right to employment may be seen as the critical foundation of economic democracy. If society cannot assure the survival of all citizens through employment access, it may be that the state has a special obligation to provide employment opportunities for all. In short, the right to employment is not a privilege, it is a right. To the extent that economic survival is critically sustained by employment it could be argued that the right to employment has the character of a fundamental human right. The critical question then is: How strategically should the state act to secure this fundamental right to economic survival?

The International Commission on Peace and Food provided a report to the UN on this matter in 1994. Its principle point was that there had to be a universal affirmation of and commitment to, the delivery of fundamental economic rights to all. According to the International Commission there should be an approach which recognizes:

*".. [t]he right of every citizen to employment is the essential basis and the most effective strategy for generating the necessary political will to provide jobs for all. What is needed is not another job generation program, but a change in social values that will accelerate the natural and inevitable evolution of society, from one in which labor is regarded as a dispensable resource to one based on full human rights and the enormous productive potential of the human being. The type and magnitude of change needed today is comparable to that embodied in President Roosevelt's New Deal for the American people during the Great Depression at a time when 25 percent of the work force was unemployed, to the Indian Government's decision to launch the Green Revolution in the mid-1960s to achieve self-sufficiency in food grains at a time when the country was highly dependent on imported food to stave off famine, and to Mikhail Gorbachev's initiatives late in the 1980s to end the Cold War and transform Soviet society."*<sup>1</sup>

There are many skeptics in political circles as well as academic and scientific circles who genuinely believe that full employment is simply an unfeasible policy. It is very possible that this outlook has a corrosive effect which initiates this discourse with an assumption of futility. Thus, a critical part of initiating this dialogue is the assumption that a full employment society is a realistic prediction if there is a plausible and wide-spread acceptance of the necessity of this in economic terms as well as the importance of this commitment in juridical and moral

---

<sup>1</sup> International Commission on Peace & Food, *Uncommon Opportunities: Agenda for Peace & Equitable Development*, Zed Books, London, 1994, p.86. See <http://www.icpd.org/UncommonOpp/CHAP04.htm>.

terms. In this sense, more may be required to fully explore all the ramifications of the notion of employment itself. This could include not simply the market value of labor but other components of labor that deal with the very nature of human development. An approach is suggested in the Human Development Report of 1990 which stresses that a significant element of the dynamic of employment is embedded in the "capability approach." This approach suggests that economic measures of labor value are insufficient. For example, a measure like the GDP may unintentionally distort our view of the critical value of employment to individual and social well being. It may be that the notion of employment seen through the lens of capability would emphasize the production and distribution of freedom as a better indication of human value. According to the Human Development Report "the basic objective of development is to create an enabling environment for people to enjoy long healthy and creative lives. This may appear to be simple truth but it is often forgotten in the immediate concern with accumulation of commodities and financial wealth." Central to the capability approach is the insight that social and economic arrangements should have as a key objective the expansion of human capability. This includes the freedom to defend and enhance valuable activity. Central therefore to the stress on capability is the expansion of human freedom in the aggregate in the economic sector. It also permits a clearer link to the fundamental human rights standards which are now the foundation of modern social organization. In short, what is central then to human rights approach to employment is the recognition of "opportunity freedom" (capability) and "process freedom." These freedoms are then cornerstones of the dynamic of employment both in terms of the conditions of access and performance.

The challenge that a focused human rights approach generates is that it compels a discourse about the values which implicate human rights and are part of the culture of labor, skill and employment. This carries a further implication that these values must in turn provide compelling normative guidance for newer approach to the problem of a commitment to full employment. It may be assumed that the current flavor of dominant economic policy is one that either tolerates or may even tacitly encourage unemployment as an economically efficient mechanism for stabilizing the market, and the dominant business values of self-interest behind it. This means that we must generate a change in the discourse of our values and then look toward a process of those changes being reflected in a wide framework of decision making at all levels for the promotion of full employment. This a view also taken by the International Commission as follows:

*"We must recognize that the present status and functioning of our economies is the result of specific choices that have been made in the past, based on priorities and values that were relevant or dominant at the time, but which we certainly are not obliged to live with indefinitely, and, in fact, are continuously in the process of discarding in favor of new values and priorities. The rapid adoption of environmentally-friendly policies around the world is positive proof of how quickly the rules, even economic rules, can change when there is a concerted will for a breakthrough."*<sup>2</sup>

---

<sup>2</sup> *Ibid*, p. 86.

## **Indicators of Economics Progress: The Power of Measurement and Human Welfare**

**Garry Jacobs**, Member, Board of Trustees of the World Academy of Art & Science;  
Vice-President, The Mother's Service Society, Pondicherry, India

**Ivo Šlaus**, Member, Board of Trustees of the World Academy of Art & Science;  
President, South East European Division, WAAS, Zagreb, Croatia; Member of the Club of Rome

### **1. Introduction**

Right measurement is a powerful instrument for social progress; wrong or imprecise measurement a source of hazard and even havoc. The essential purpose of economic activity is the promotion of human development, welfare and well-being in a sustainable manner, and not growth for growth's sake, yet we lack effective measures to monitor progress toward these objectives. Advances in understanding, theory and measurement must necessarily proceed hand in hand. A companion article in this publication sets forth the urgent need for new theory in economics. This article sets forth the complementary need for new measures. The stakes are high and the choice is ours. On one side, rising social tensions, recurring financial crises and ecological disaster; on the other, the progressive unfolding and development of human capacity in harmony with Nature. The deficiencies of GDP as a measure are well-documented by leading economists Kuznets, Tobin, Tinbergen and many others; but, unfortunately, decision-making still remains largely based on GDP, valid during 1930-70 perhaps, but certainly inappropriate today. The challenge is to derive more appropriate indicators to reflect real, sustainable economic welfare, social development and human well-being. The attributes that have made GDP so successful are often overlooked — it provides clear objectives for policy and decision-making. We propose new composite indicator, HEWI, which can be used to guide decision-making, which retains the strengths associated with GDP, while substantially enhancing its value as a measure of human economic development. HEWI monitors progress on factors that contribute prominently to present economic welfare — household consumption, government welfare-related expenditure, income inequality and unemployment — as well as factors that have the potential to significantly enhance long term sustainability — education, fossil fuel energy efficiency and net household savings. The index is applied to assess the economic performance of select countries from 1985-2005.

### **2. Tools and Measures**

Human beings are distinguished from other life forms by their unique ability to fashion tools which extend our powers of consciousness beyond the reach of our senses and our powers of execution beyond the limits of strength, endurance, space and time imposed by our physical bodies. Tools are an instrument for social evolution. Language is a tool which enables us to formulate original ideas, communicate our inmost thoughts and feelings, record

events for posterity, transmit knowledge down through the ages, and exchange ideas over vast expanses of time and space. The efficiency of our tools is an index of our social development.

Measurement is another remarkable human ability. Many tools acquire power through their use in or capacity for measurement, such as the calendar, weighing scale, measuring rod, astrolabe, surveyor's theodolite, carbon dating, and DNA fingerprinting. The mariner's compass and chronometer enabled ships to navigate safely far from land. Modern medicine could not exist without the thermometer, stethoscope, sphygmomanometer and glucometer, along with measures for blood cell count, hemoglobin, cholesterol, and countless other metrics. Today every food ingredient is carefully measured for its exact nutritional content.

Money is one of humanity's greatest inventions. It is both a tool and a measure. But unlike other measures that are confined to measuring a single dimension or quality, money has the capacity of assigning value to almost anything material or immaterial — physical objects, human labor, social status, information, obedience, loyalty and sometimes even love. Coinage enabled ancient kingdoms to become military and economic powers, because it facilitated standardized valuation of products and services for the financing and maintenance of huge armies. The concept of zero was unknown to the Greeks and Romans. Developed independently in India and Mexico, it reached Europe via Arabia only in the 10th century. One need only try adding and multiplying Roman numerals to realize how greatly the introduction of Hindu-Arabic numerals, the zero, and the decimal place enhanced the capacity for accounting and the growth of trade. Combined with double-entry bookkeeping, they spurred the commercial revolution in 13th century Italy, facilitating the precise calculation of capital and profit.<sup>1</sup>

The development of modern economy has been made possible by continuous development and refinement of tools and measures. The Domesday Book is a record of the first known numerical census conducted by William I of England in 1085 to identify arable lands, livestock, fisheries and other sources of national wealth as a basis for improved tax collection. The first US census was conducted in 1790. Today economics employs a wide range of indispensable measuring tools, including GDP, the consumer price index, interest rate, money supply, exchange rate and the unemployment rate. While the general public may regard these tools as accurate measures of economic reality, economists recognize that they are in fact only rough, approximate indicators designed to reflect economic reality rather than accurately measure it.

Right measurement is a powerful instrument for social progress, which is why efforts are constantly being made to improve their power and precision. The atomic clock has replaced the sundial, hourglass and pendulum. DNA fingerprinting has largely replaced hand fingerprinting as a precise means for identifying human beings. Global satellite navigation has made the chronometer obsolete. The 20th century has been aptly described as *The First Measured Century* in recognition of the enormous recent strides in harnessing the power of measurement.<sup>2</sup> Phenomenal scientific and social progress since the end of World War II has opened up previously unimagined opportunities and ignited soaring aspirations the world over. Today humanity pursues a common quest for higher standards of living, greater economic security, sustainable development, higher levels of welfare and well-being. For decades, the very intensity of the pursuit for a better life obscured the inadequacy of our

---

<sup>1</sup> Sombart, Werner. "Medieval and Modern Commercial Enterprise", *Enterprise and Secular Change*, edited by Frederic C. Lane., and Riemersma, Jelle. Homewood. 1953. 25-40.

<sup>2</sup> Caplow, Theodore., Ben J. Wattenberg., and Louis Hicks. *The First Measured Century: An Illustrated Guide to Trends in America 1900-2000*. New York: American Enterprise Institute Press, 2000.



conceptions and our instruments for achieving it. But in recent decades we are compelled by social, economic and environmental challenges to seek more precise definitions of what we mean by these terms and more exact tools for measuring our progress toward achieving them. Social and economic measures are inseparable from political objectives and public policy. It is not merely scientific precision that we are after, but more powerful instruments for achieving human objectives.

Wrong or imprecise measures are a source of hazard and even havoc. They can result in wrong policy with disastrous consequences. As John Kenneth Galbraith observed in his book *The Great Crash 1929*, the lack of reliable measures combined with faulty theoretical knowledge led to actions that worsened rather than mitigated the crisis. Galbraith cites poor economic intelligence among five principal causes for the Great Depression. From 1929 to 1932, “policy was almost entirely on the side of making things worse.”<sup>3</sup> Had the real risks associated with US mortgage-backed securities been more accurately assessed a few years ago, the entire sub-prime mortgage crisis and resultant international financial debacle might have been avoided. Wrong measures can undermine good theory and practice. Right measures can dramatically enhance the rate of social progress.

It’s not just the economists and policy-makers who need new and better measures of economics and social progress. We all do. In democratic societies where ordinary citizens are bombarded by information and asked to support the best policies, the absence of clear, reliable measures of economic welfare and social progress lead to endless debate, confusion, obfuscation, recriminations and even despair. As we have recently witnessed, wrong measures can lead to a false sense of security or euphoria at the very moment crisis is preparing to strike.

### 3. Measures of National Income

Adam Smith, David Ricardo and the other great founders of modern economics made remarkable contributions to our understanding of the wealth of nations, yet they lacked effective measurements to apply their concepts with precision. This changed dramatically with the development of quantitative economic measures after World War I. Among all the tools evolved to measure economic progress, none has attracted more attention and controversy than GDP and related indicators used to measure national and per capita income over time and in different countries. With the onset of the Industrial Revolution, the conception of economic power and national wealth shifted from agriculture to industrial production. Then early in the 20th century it was further broadened to encompass a wide range of tangible and intangible services.

The idea of valuing such a diverse range of economic activities in terms of a single common denominator, price, was itself an ingenious invention, but one that has since given rise to serious misconceptions and policy distortions. As money is one of the most powerful instruments of social progress, price is one of the most powerful tools of measurement. But the temptation to measure all value in terms of price plays havoc with commonsense, reason and human values. Can we really equate the value of an antique vase, collector’s baseball card or music memorabilia with the cost of food and medicine to save the lives of thousands of children? Is a billion dollars spent on military armaments really equivalent to a comparable

---

<sup>3</sup> Galbraith, Kenneth, John, *The Great Crash 1929*, New York: Mariner Books, 1954. 171, 182-3.

investment in education or public health? Is an extra dollar of income for the richest of the rich really equivalent in value to the individual concerned and society in general as an extra dollar earned by the poorest of the poor? Is a \$100 of renewable energy equal in value to \$100 of non-renewable fossil fuel? Is an hour of paid services for cooking or cleaning at home more valuable than an hour of unpaid work by family members? According to GDP, the answer to all these questions is 'yes'.

GDP was developed as an indicator of market activity during the Great Depression and a war-planning tool during the Second World War, when the primary objective of government was to stimulate industrial production.<sup>4</sup> Based on its utility during the war, it became an official instrument of US economic policy in 1946. Originally intended as an index of industrial growth, growth of GDP came to be regarded as synonymous with an improvement in a nation's economic health and the welfare of its people. Its creator, Simon Kuznets, warned the US Congress about its limitations as early as 1934, "The welfare of the nation can scarcely be inferred from a measurement of national income as defined above."<sup>5</sup> Three decades later he asserted the need for distinguishing between quantity and quality of growth, costs and return, short and long run.<sup>6</sup> In the early 1970s William Nordhaus and James Tobin again reminded us that GDP was never intended as a measure of welfare or well-being.<sup>7</sup> In one of his last speeches Senator Robert F. Kennedy summed up the limitations of GDP. "We cannot measure national achievements by GDP, since GDP includes air pollution, cigarette advertisement and ambulances to clear our highways after carnage. It counts special locks for our doors and jails for people who break them. GDP includes destruction of redwoods and of Lake Superior. GDP grows with the production of napalm and nuclear warheads. It does not include the health of our families, the quality of their education, it is indifferent to the safety of our streets... In short, GDP measures everything except what makes life worthwhile."<sup>8</sup> Yet these concerns went largely unheeded and even now we are told daily to measure our present and future welfare in terms of a number that conceals and distorts more than it reveals and clarifies.

GDP is simply a measure of the total of finished goods and services produced in the monetized segment of the economy valued on the basis of cost, regardless of its relative importance or benefit to human well-being, and without making any distinction between productive and destructive, essential and trivial, sustainable and unsustainable activities. Thus, earthquakes, hurricanes, rising crime and divorce rates, increasing levels and costs of litigation, proliferation of hand guns, increasing incidence of epidemic diseases, increasing consumption of sedatives and saturated fats, subprime mortgages and unsustainable credit card debt, chemical pollution, depletion of non-renewable resources, military spending and all-out war are indistinguishable by this measure from rising levels of employment, education, public health and safety, cleaner air and water, better housing and nutrition and retirement security. GDP is simply a gross measure of total output, market activity, money changing hands.

---

<sup>4</sup> Cobb, Clifford, Ted Halstead and Rowe, Jonathan. "If the GDP is Up, Why is America Down?", *Atlantic Monthly*, October 1995, accessed August 2, 2010, <http://www.theatlantic.com/past/politics/ecbig/gdp.htm>.

<sup>5</sup> Kuznets, Simon. "National Income, 1929-1932". 73rd US Congress, 2d Session, Senate Document No. 124, 7, accessed August 2, 2010, <http://library.bea.gov/u/?SOD,888>.

<sup>6</sup> Kuznets, Simon. "How to Judge Quality," *New Republic*, October 20, 1962, 29.

<sup>7</sup> Nordhaus, William D., and James Tobin. "Is Growth Obsolete?", *The Measurement of Economic and Social Performance, Studies in Income and Wealth*, Vol. 38, NBER, 1973. Cowles Foundation Discussion Papers 319, Cowles Foundation, Yale University. Accessed August 10, 2010, <http://cowles.econ.yale.edu/P/cp/p03b/p0398ab.pdf>.

<sup>8</sup> Kennedy, Robert F. Speech at University of Kansas, March 18, 1968. Accessed August 6, 2010, <http://www.jfklibrary.org/Historical+Resources/Archives/Reference+Desk/Speeches/RFK/RFKSpeech68Mar18UKansas.htm>.

Long considered a technical issue of concern only to economics, it is now evident that bad measures can lead to bad and even catastrophic policy, just as wrongful treatment arising from an erroneous medical diagnosis can convert a mild disorder into a fatal illness.<sup>9</sup> Major determinants of human welfare and well-being are too important to be regarded as mere technical issues. It is both unfortunate and ironic that even the general public has come to place so much faith in this inadequate and misleading index of national progress, that people celebrate each increase in GDP even when their own personal living standards have declined markedly in real terms. Aspirations for a better life have become so universal that people everywhere readily take pride and satisfaction in the real or false sense of national achievement reflected in the numbers.

The recent history of the debate regarding GDP is too voluminous and frequently cited to warrant inclusion here. Before examining other options, we can simply summarize the most salient concerns that need to be addressed in the search for more adequate alternative measures.

1. GDP makes no distinction between factors that contribute to social progress and those that may actually impair it or reflect its decline. GDP treats natural disasters, divorce, crime and war as economic benefits, e.g. the massive expenditure to redress the human crisis and damaged infrastructure consequent to Hurricane Katrina or the rising crime rates which spur increasing public expenditure on security measures, law enforcement and prisons. It treats on par investments in human capital, such as those that raise the level of education and training, with expenditures that reflect a decline in human welfare, such as increasing need for psychiatric services or divorce-related legal fees.
2. GDP, a measure of activity, flow, is wrongly interpreted as a measure of wealth, stock. Higher levels of GDP growth can be and are often accompanied by increasing levels of financial debt or depletion of natural assets, as during times of war, excessive government spending or household borrowing.
3. GDP includes some forms of economic activity that consume more capital than they generate. Consumption of non-renewable resources generates a flow by consuming an irreplaceable asset. War increases output and flow for an activity which actually destroys the products produced along with other natural and social forms of capital. Like a company without a balance sheet to distinguish between investment and expenditure, asset creation and asset destruction, GDP is virtually blind to these distinctions.
4. GDP does not distinguish between sustainable and unsustainable activities. It treats the depletion of natural capital and the costs associated with compensating for it as income. Rising levels of consumption do not necessarily result in higher levels of economic welfare or well-being, as in the case when the declining quality of the public water supply spurs demand for more costly bottled water or increasing crime necessitates rising expenditure on personal and commercial security.
5. GDP/capita is a measure of national productivity, not of personal consumption or the economic welfare of households. It takes into account the value of all financial transactions at market prices, including categories of expenditure such as military spending and general administration that are not directly related to household income and expenditure.
6. GDP ignores the impact of unemployment on human security and welfare.

---

<sup>9</sup> Diagnosis is based on a set of direct and indirect measurements summarized in a medically-formulated statement of a person's health. GDP as currently utilized in politics and economics is a diagnosis of a nation's economic health, but an incorrect one.

7. GDP takes no account of the distribution of income. Therefore, average per capita GDP figures can disguise the fact that growth may be flat or even negative for a substantial part of the society while it rises exponentially for a small proportion of the population in the highest income bracket.
8. GDP fails to distinguish between speculative gains in financial markets during a bubble economy and real gains from increasing employment, production and personal consumption.
9. GDP ignores the non-market household and community economy, assigning zero value to household work and voluntary services, while attributing positive value to the very same activities when they are performed for pay. One of the reasons that GDP is so unsuitable as a quality of life index is its inability to take into account the value of parenting, home care and home schooling, household work, volunteerism and other forms of non-monetized activities that are invaluable to individuals and society-at-large.
10. GDP and other price-based indices grossly understate real improvements in living standards and quality of life, because they measure only the cost of goods and services, while ignoring real and often substantial improvements in product quality and quality of life. These gains accrue from real advances in social development, including advances in science and technology, improvements in social organization, e.g. the Internet, and globalization.

#### **4. Need for New Theory**

As significant as it is, the debate regarding GDP and other measures masks a deeper and far more important issue. For in trying to arrive at a more appropriate measure for real human progress, it calls into question the fundamental purpose of economic activity and the fundamental premises on which modern economic theory is based. Theory and measurement go hand in hand. Without sound theory, measures can result in misleading conclusions. Even great minds can fail in matching theory and measurement. Aristotle, possibly the greatest philosopher and scientist that ever lived, failed to properly measure motion. Although an excellent experimentalist and keen observer, his incorrect procedure for measuring motion stopped the development of physical sciences for over a thousand years, prompting Russell to castigate Aristotle as the greatest hindrance in the history of science. Would Aristotle have understood motion better, if he had had access to more or better information regarding the shape, color and composition of falling objects? Some of this data would have been useful, but the real problem was that Aristotle was missing a necessary abstraction that would lead him to the understanding of motion. He lacked the foundation for the underlying conceptual theory. Success of physical and life sciences today are rooted in precise and adequate measurements married with sound theory. Measurements often generate paradigmatic changes in our understanding of Nature and in turn these changes influence the meaning and process of measurements.

As the authors have elaborated in a separate article in this issue, in striving to attain to the rigor of the physical sciences, economics has sought for impersonal universal principles governing economic systems. Not only in its assumptions, but in its stated goals as well, economics too often equates all market activity with human welfare and well-being. Thus, both economic theory and measurement are subject to the same limitations. This approach must inevitably be supplanted by the evolution of a more human-centered approach to economic science.

In an effort to attain the value-free objectivity associated with physical science, latter day social scientists have overlooked the fact that GDP itself is founded upon inherently subjective judgments, equating crime and war with more food and better housing, pollution-prone fossil fuels with clean, renewable energy. At the same time, GDP assigns zero value to non-monetized activities that enhance welfare, such as caring for children and the elderly, or leisure time and family relationships that enhance well-being. All human activities are goal-oriented and value-based and therefore, the only meaningful measure must be one that consciously acknowledges those goals and values and assesses the extent to which economic activity achieves them.

True advance in measurement must be predicated on commensurate advance in the underlying theory. Thus, we are compelled to ask at the outset the most apparently naïve of questions, namely, what is the purpose of economy and economic activity? What role does it play in human existence, social development and evolution? The most obvious answer is certainly the most reasonable and acceptable. The aim of economic activity is to enhance human welfare and well-being. If Kuznets and others are correct in stating that economic policy based on GDP too often pursues other goals that are different and even incompatible with human welfare and well-being, then there is full justification for urgently striving to evolve both new theory and new measures to reorient economics toward its true purpose. The companion article *Wealth of Nations Revisited* examines the need for new theory.<sup>10</sup> The remainder of this article focuses on the need for new measures.

## 5. Measures and Indicators

A distinction needs to be made between measures and indicators. In the physical sciences, we are accustomed to measuring tangible physical parameters such as distance, mass, speed, frequency and wavelength. But in the social sciences, many of the parameters we seek to measure do not lend themselves to simple quantification. While most physical events can be accurately described in terms of a few parameters, human activities are far too complex for complete categorization. Human events are far more complex because they are influenced not only by physical parameters in time and space, but also by social, cultural, political and psychological factors that are often difficult to perceive and impossible to measure directly, such as the decision whether to buy a genuine Prada leather bag from the shop or a passable imitation from a street vendor at one-third the price. Therefore, in the social sciences, we must often seek for more effective ways to measure the complexity of social reality.

Thirty years ago, India struggled with the task of measuring the progress of 600 million population living in 575,000 villages and more than 10,000 cities and towns. In spite of making huge public investments and borrowing extensively from overseas, according to traditional measures based on per capita GDP in constant dollars, the country had raised its per capita living standards by only 27% between 1960 and 1980. By comparison, France increased its per capita GDP by 109%, Korea by 190% and Japan by 237% during the same period. Given the very low base and rising expectations post-Independence, India's performance looked far from satisfactory. India's leadership was perplexed and discouraged by the relatively slow pace of progress. Intuitively many felt that the actions they had taken were essential for national progress, yet according to available economic measures they had been a dismal failure.

---

<sup>10</sup> Giarini, Orio., Jacobs, Garry., Lietaer, Bernard., and Šlaus, Ivo. "Introductory Paper for a Programme on The Wealth of Nations Revisited", *European Papers on the New Welfare*, No. 15, 2010.

Then a study in 1980 documented huge gains that were not reflected by GDP. It pointed out that more than 80 million lives, a population equivalent in size to that of reunited Germany, had been saved since Independence as a result of improved public health. If saving 80 million human lives is not progress, then what is? Yet the first result of this remarkable accomplishment was to dilute per capita GDP growth, thereby creating the impression that the country was going nowhere or even backwards. The study also found that life expectancy had risen by 60%, infant mortality was down by a third, and literacy had more than doubled since 1950. The total number of schools and colleges had almost tripled. Primary school enrollment had quadrupled. The number of hospital beds had tripled. Incidence of malaria had declined from 75 million cases to 100,000 and deaths attributable to the disease from 800,000 to only one. Electricity had been made available for the first time to hundreds of millions of people. A country which lost three million people to famine in 1943 and required 10 million tons of imported foodgrains to avoid another massive famine in the late 1960s had increased its food production by two and half times and become self-sufficient in foodgrains. Per capita food consumption had risen 25%.

The Indian example highlights the crucial need for additional and alternative methods. It also brings into focus a fundamental difference between economic growth and social development. Recognizing the urgent need for more accurate ways to assess national progress, the country began a search for alternatives. To obtain a more reliable basis for policy-making and assessment, the Government of India identified 107 indicators of development for regular monitoring at the local and national level.<sup>11, 12, 13</sup> Frequent physical surveys of the entire territory and population to measure actual living standards were prohibitively expensive. Rather than relying solely on direct measures such as literacy, life expectancy and infant mortality, the study proposed searching for parameters that were correlated with rising living standards. For example, international comparisons revealed that rising income levels were closely correlated with rising levels of sugar consumption. In India too, increasing consumption of sweetened foods and beverages was among the very first observable changes associated with increasing prosperity. On this basis, researchers postulated that rising sugar consumption might form one component of an easily measurable index of rising living standards among the poor in rural areas in India. The sugar index was never adopted, but it is illustrative of the distinction between direct measures, which tell us about performance on a specific variable, and indicators, which can be taken as reflections of social development. A measurement is a precise means of evaluating a phenomenon on a fixed scale of values, whereas an indicator is an indirect and imprecise means of assessment by observation or measurement of changes in one or a group of related variables that are found to accurately reflect changes in a wider field of phenomenon. An increased heart rate is an indicator rather than a measure of health. It can vary widely with increasing levels of physical activity and stress as well as with the onset of heart disease. By itself it tells us very little, but when correlated with other observations, it can serve as a useful index of cardiac health.

---

<sup>11</sup> Jacobs, Garry. "Growth: The Real Symptoms," *The Hindu*, April 23, 1981.

<sup>12</sup> Jacobs, Garry. "Common Indicators of Development," *The Hindu*, April 24, 1981.

<sup>13</sup> Jacobs, Garry. "New Indicators of Development," *The Hindu*, May 5, 1981.

## 6. Characteristics of a Successful Indicator

In our eagerness to find a more acceptable measure of human progress, let us not lose sight of the remarkable features that have made GDP so successful and adaptable. The genius of GDP is that it expresses all economic activity in terms of a common denominator, price or currency value. When adjusted for changes in price levels due to inflation, this permits comparisons over time. When adjusted for differences in costs of living in different countries, it permits comparisons between countries. Based on data that is easily gathered at the national level, it facilitates frequent measurement in a timely manner. Simplicity, universality, ease of application and timeliness are great strengths that should not be lightly discarded. GDP has also derived a symbolic capacity to precisely indicate changes in the underlying fields that it measures, such as consumer spending, housing, electronics, transportation and communication.

In fairness, we must also recognize that the indicator cannot be faulted for its widespread misapplication and misinterpretation. That is the error of those who wrongly apply and interpret it. GDP has a role to play as an indicator of short term changes in economic activity. Our challenge is to derive more appropriate indicators to reflect real and sustainable economic welfare, social development and human well-being — tasks GDP was never intended to perform. In doing so, we should avoid the error of those who currently regard GDP as an effective composite measure. Trying to accomplish all things with a single measure, either simple or complex, is more likely to confuse than to clarify. The success of GDP over more than half a century is a compelling argument for simplicity and universality. Its greatest weakness has been the attempt to do too much with too little — to impute reliability and significance far beyond what the number really tells us, a source of bad policy and great harm to society.

The most rational approach is to start with a clear conception of the goals we want to achieve and a valid theoretical framework describing the underlying processes that contribute to that result, then devise measures capable of monitoring our progress toward achieving these goals. Clarity of conception is the only sound basis for precise measurement. As long as economic growth per se was the main social objective, as it was during the Industrial Revolution, Great Depression and Second World War, GDP did a reasonable job as a monitoring instrument. But the aims of 1930s are not our present aims, since we now realize that unfettered growth would lead us to ecological disaster.

At the same time we must be sufficiently objective to concede that much of what we would like to measure may be for the time being beyond our capabilities, either because the required data is not available, is not sufficiently accurate or is simply too subjective to rely on. As we have seen, even defining measures for the relatively straightforward conception of economic growth is fraught with difficulties, resulting in measures that include activities that are the very opposite of the goal we desire. When it comes to measures of social development, sustainability, human welfare and well-being, the challenge is even greater. Humility is always a virtue, but never more so than in purporting to measure the fulfillment of human aspirations. It is wiser to attempt less to begin with and do it well than to attempt all and do it so inadequately that it serves little utility. In either case, it is important to recognize both what is included and what is excluded in each formulated measure.

## 7. The Problem of Value

Before examining alternative approaches to the measurement of social progress, it may be useful to consider some of the factors that pose serious obstacles to the quantification of economic growth, sustainable development, welfare and well-being.

### 7.1 Uncertainty & Risk

The importance of the linkage between theory and measurement is most powerfully illustrated by Orio Giarini's challenge to traditional measures as set forth in *Dialogue on Wealth and Welfare* (1980) and *Limits to Certainty* (1993).<sup>14, 15</sup> There he highlights fundamental differences between the industrial model of economy that emerged with the Industrial Revolution and the modern service economy which has emerged post 1970. His central thesis is that methods for measuring the value of manufactured goods are inappropriate for measuring the value of many types of services, emphasizing that even in the manufacturing sector 80% of what we regard as production cost now also consists of service activities. In this way he challenges the adequacy of GDP as a measure of economic growth, when applied to the valuation of basic services such as health care, insurance, education, R&D, etc. Can the value of longer life expectancy and better health, higher levels of education, greater social security be adequately evaluated in terms of the cost of production and delivery?

In *Limits to Certainty*, Giarini argues that value in the new economy is probabilistic, rather than deterministic, because it involves new types of risk and far greater degrees of complexity, vulnerability and uncertainty. Cost in manufacturing is measured at the stage up to the point of final sale. Whereas in regard to services the actual cost of full delivery may not be known until long after the sale. This is most obviously the case with regard to various forms of insurance, but it applies also to the cost of fulfilling on-going product and service obligations. Toyota's worldwide recall of more than nine million vehicles in 2009-10 — equal in quantity to 90% of total light vehicle sales in the USA in 2009 — cost the company and its dealers upwards of \$4 billion. Hurricane Katrina is estimated to have cost upwards of \$200 billion. This includes \$120 billion in insured catastrophic losses, but does not include the significant increase in the cost of home insurance that affected all US homeowners in the years following the disaster.<sup>16</sup> Human error has recently proven far more costly than the most violent acts of nature. The losses associated with Katrina are dwarfed by the costs associated with the collapse in value of mortgaged-back securities following the subprime crisis, an instance in which the linkage between the theory of value and its measurement is transparent and direct. Between July 2007 and June 2008, rating agencies lowered the credit ratings on these securities by \$1.9 trillion. Indeed, many regard wrong valuation as the principal cause of the crisis. Valuation errors led to bad policy and bad business decisions on an inconceivable scale. Residential properties in the US declined in value by more than \$5 trillion or 32% in the following year. The value of retirement assets and other investment assets dropped by more than \$8 trillion.<sup>17</sup> Of course, both the potential costs and inherent uncertainty associated with the consequences of current economic activities on climate change are considerably greater.

<sup>14</sup> Giarini, Orio, *Dialogue on Wealth and Welfare*, Club of Rome, 1980.

<sup>15</sup> Giarini, Orio, and Stahel, Walter. *The Limits to Certainty*, preface by Prigogine, Ilya. Dordrecht /Boston: Kluwer Academic Publishers, 1993.

<sup>16</sup> Stahel, Walter R. "Global Change, Acts of God, Acts of Man, Acts of Nature and Systemic Risks," Geneva Association Information Newsletter, May 2010, 3. Accessed August 5, 2010, [http://www.genevaassociation.org/Portals/0/Geneva\\_Association\\_Systemic\\_Risk\\_in\\_Insurance\\_Report\\_March2010.pdf](http://www.genevaassociation.org/Portals/0/Geneva_Association_Systemic_Risk_in_Insurance_Report_March2010.pdf).

<sup>17</sup> Altman, Roger C., "The Great Crash 2008", *Foreign Affairs*, 88, (2009): 5. Accessed August 20, 2010, <http://www.foreignaffairs.com/articles/63714/roger-c-altman/the-great-crash-2008>.



These examples illustrate the magnitude of uncertainty and systemic risk inherent in the modern service-based economy in which contractual obligations of the seller as well as the uncertainties of the buyer may extend long after the date of sale, throughout the entire life cycle of utilization and even disposal. This view challenges the fundamental notion of price based on the equilibrium between supply and demand as an adequate measure of value. And it goes to the heart of the question, 'What do we really mean by value?' The ingenious device of equating price with value has served as the basis for the entire development of modern mathematical economics as a science, yet all the major objections to GDP as an indicator of human welfare and well-being point to the inadequacies, gross distortions, disastrous policy measures and catastrophic consequences that can arise from implicit faith in this equation. This perspective, which highlights the linkage between theory and measurement, reinforces the need for more fundamental reassessment of economic theory as proposed in the companion article "Wealth of Nations Revisited".

Evolving measures to adequately reflect risk and uncertainty is a formidable challenge for the future of economics. In section 10.4 below we illustrate one approach to this challenge in formulating an index for sustainable energy efficiency.

## *7.2 Price and Quality*

GDP measures social progress in terms of an increase in the total transaction value of goods and services at market prices. Price is a powerful tool for measurement, but it can also introduce gross distortions for the simple reason that price is an inadequate measure of value. Can we really place a dollar value on an extra hour of leisure? A college education? A cataract operation that restores eyesight to the elderly? An extra year of human life? GDP and other price-based indices grossly understate real improvements in living standards and quality of life, because they measure only the cost of goods and services, while ignoring real and often substantial improvements in product quality and quality of life. These gains accrue from real advances in social development, including advances in science and technology, improvements in social organization, e.g. the Internet, and globalization. Differences in product quality can cause gross distortions in the measurement of inflation and the price deflators used to compare GDP growth over time. The price of a man's shirt in USA is about the same as it was fifty years ago in current dollars as a result of world trade, which represents a decline in price of 80% in constant dollars.

Efforts to measure social progress over time are also impeded by radical changes in the quality of goods, services, jobs and life in general. A 1920 Model-T Ford and 2010 Mercedes or Lexus are both cars, but in other ways they are far from equivalent. Traveling across the USA on horseback in five months or by car or train in five days or plane in five hours are all forms of transportation, but the difference between them cannot be reduced simply to measures of speed and cost. Because of technological advances, a long distance telephone call from USA to India, which cost \$1.50 minute in 1975, equivalent to \$4.50 today, is now virtually free over Skype and other VOIP services. Similarly, the price of personal computers has declined 90% in real terms since 1990, while their speed has increased 1000 fold and storage capacity 10,000 fold.

Advance in social development leads to enhancements in the quality of life which are very difficult to quantify or reduce to monetary terms. These qualitative dimensions are linked to rising levels of education, greater social security provided by private and government-funded insurance programs, improved medical treatment and public health, new forms of

entertainment, machines that reduce physical labour, and many other types of comfort and convenience. It is impossible to value in terms of price the impact on quality of life resulting from antibiotics, year-round access to a full range of fruits and vegetables from all over the world, email, the Internet, on-line education and training, social networking, global access to a free encyclopedia like Wikipedia, e-books, i-Pods, cell phones, ATMs, improvements in the quality of automobiles, and countless other social and technological innovations of the past few decades.

The nature and quality of employment required to achieve economic security has also changed dramatically. Manual labor on farms and in factories has been largely replaced by white collar categories of employment which are less physically demanding. In the USA, for example, professional, technical, managerial and other categories of white collar employment rose from 24% to 75% of total employment between 1910 and 2010, while employment in crafts, manual labor, farming, mining and household services declined from 76% to 25%. Workers engaged in farm labour fell from 18% to under 1%. Nearly 25% of all workers in the USA are now engaged in professional, technical and related activities. These qualitative changes continue. In addition, the qualitative value of employment cannot be assessed strictly in terms of physical working conditions, type of labour or compensation. Types of employment differ widely in terms of the social status and self-esteem they carry, a major reason why the more highly educated shun even undemanding, well-paying jobs that they deem beneath their social status. In our effort to scrupulously account for hidden costs such as environmental degradation and social problems, we should not err in the opposite direction by overlooking the enormous hidden gains that have accrued to the entire society.

## 8. What Are we Trying to Measure?

GDP and similar measures may be very useful tools for monitoring short term changes in industrial activity over the course of a few years, but they are grossly inadequate to reflect the complex structural changes that occur during the process of social development and the longer term implications and sustainability of the present mode of economic activity. As Giarini reminds us, like other man-made powerful tools, financial information can be either positive or negative, depending on the values it is used to express. "The production of powerful tools is one thing, but the definition of their goals and their positive utilization is a matter of human choice and responsibility."<sup>18</sup> Thus, before evaluating the utility of any specific measure, we must be as clear as possible about what those objectives actually are. This naturally raises the question, what are we trying to measure?

A very wide range of individual indicators are now being monitored which purport to reflect economic and social progress. The OECD regularly monitors indices relating to fertility rates, migration, marriage and divorce, education, unemployment, income inequality, gender wage gaps, social spending, old age replacement rates, poverty, life expectancy, health expenditure, birth weight, infant mortality, health risks, life satisfaction, use of alcohol, drugs and tobacco, strikes, voting, public policies, work accidents, prisoners and many others. In addition there have been numerous attempts in recent decades to formulate composite indices of progress to supplement or supplant GDP, including UNDP's Human Development Index (HDI), the Index of Sustainable Economic Welfare (ISEW), the Genuine Progress Indicator (GPI), Environmentally Sustainable National Income (eSNI), Sustainable Development

---

<sup>18</sup> Giarini. *Dialogue on Wealth and Welfare*, pag. 186.

Indicators (SDI), National Accounts of Well-being (NAW), Calvert-Henderson Index, and others.

Before examining the utility of these alternatives, it is necessary first to examine more closely the theoretical conceptions and definitions on which they are based. All of these measures attempt to address one or more of the following aspects of progress.

- Economic growth
- Economic welfare
- Development
- Sustainable development
- Human welfare
- Well-being

These terms are so commonly used today that it is natural to assume that they have standardized meanings, but this is far from the case.

### *8.1 Economic Growth*

The term economic growth is widely used with reference to increasing output by an economy as measured by total national income or expenditure, i.e. GNP or GDP. Although most criticism of GDP focuses on what are considered its wrongful inclusions and exclusions, Orio Giarini raises a more fundamental challenge regarding the basic methodology for measuring value and risk in a modern service economy, an issue already discussed in Section 7.1 above.

### *8.2 Economic Welfare*

The concept of economic welfare is employed to focus on the impact of economic growth on the material living standards of households and individual citizens, rather than on production. It includes in-kind services provided by government such as subsidized health care and educational services, while excluding defense spending and general government expenses which do not directly contribute to household consumption.<sup>19</sup> It also emphasizes the importance of the distribution of income and wealth in society. Economic welfare is commonly measured in terms of per capita GDP or per capita household consumption expenditure at constant currency value. International comparisons are made in purchasing power parity equivalent. We argue later in this paper that improvements in the measurement of economic welfare can and should be rapidly adopted, which will significantly enhance our understanding of the impact of economic activity on human beings. Sections 10-12 of this paper present a tentative model and supporting data for a new index of human economic welfare (HEWI).

---

<sup>19</sup> Stiglitz, Joseph E., Sen, Amartya and Fitoussi, Jean-Paul. *Report by the Commission on the Measurement of Economic Performance and Social Progress*, 2009, 8, Accessed August 23, 2010, [http://www.stiglitz-sen-fitoussi.fr/documents/rapport\\_anglais.pdf](http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf).

### 8.3 Social Development

The term development is commonly used as a catch-all phrase for something that includes, but extends beyond considerations of economic growth. Socio-economic development is frequently used as a proxy for per capita economic growth measured in real terms. Sometimes it is used with reference to the economic welfare of citizens; sometimes more broadly to include non-economic factors such as health, education, life expectancy, social inclusion, gender equity, social cohesion, freedom, democratic participation and good governance; and at others with reference to national investments in infrastructure, education, science and technology, energy and other fields deemed essential for national progress.

In contrast to this vague general usage, we would argue for making a clear and emphatic distinction between growth and development. Growth represents a horizontal quantitative expansion of existing capacities and activities in society; whereas development involves a qualitative enhancement in the structural capabilities of society, an increasing capacity for organization, coordination, and complexity. Growth may be regarded primarily as an economic concept, but development in any field belongs to the wider realm of society as a whole. Growth generates more of the same on a larger scale. Development generates something new and better that was not possible earlier. Development relates to enhancement of social productivity through strategies such as investments in human capital by education and training, enhancement of social capital and organizational capabilities — with regard to governance, production, commerce, research, social welfare, etc. — technological advancement, greater access to information, and networking between individuals and institutions. India's dilemma in 1980 discussed earlier highlights the distinction. Improvements in food security, life expectancy, education, and the like represent not only real tangible benefits, but also investments in future generations that cannot be quantified in terms of present income. Although growth of per capita GDP was relatively modest, the overall improvements in quality of life and national capacity were many times greater; but they were not reflected by existing measures, because none of these parameters adequately lend themselves to either precise definition or quantification. They can only be assessed on a combination of quantitative and qualitative dimensions, both tangible and intangible.

But the problem of defining and measuring development lies even deeper, for it is rooted in underlying, invisible social processes that may be apparent on the surface only long afterwards. A notable instance is a phenomenon which Harlan Cleveland, former US diplomat, educator and World Academy President, observed in East Asia 60 years ago and termed the revolution of rising expectations. There he witnessed a rapid change in social attitudes expressing as higher aspirations, greater dynamism and individual initiative, sweeping aside the sense of resignation, complacency, submission to the status quo which had characterized earlier periods of relative social stagnation. He rightly perceived that this underlying wave of surging human aspirations would dramatically alter the future of East Asia in the decades to come and eventually spread its influence to other parts of the world. His insight reminds us that all economic processes occur on a bedrock social foundation and are ultimately determined by more basic social and cultural attitudes and values. The sudden explosive transformation of Eastern Europe following the fall of the Berlin Wall appears abrupt and unpredictable when viewed in terms of measurable events, but the undercurrents of revolutionary transformation were active long before they manifested on the surface in public life. The relatively recent recognition of the economic power and potential of China, India, and Brazil has a similar character.

Measurement of this social process lies beyond the scope of the present study, but we

note here that the future evolution of economics and other social sciences will compel us to inquire more deeply into the common principles underlying all social change and to evolve effective measures or indicators that may be very different than those currently in use to measure growth and development.<sup>20</sup>

#### *8.4 Sustainable Development and De-Growth*

The Brundtland Commission popularized the term sustainable development as development that meets the needs of the present generation without compromising the ability of the future generations to meet their needs.<sup>21</sup> While most commonly used with reference to the ecological carrying capacity of the natural environment, it is also applied with reference to economic, political, technological and social issues, including energy, water, mineral resources, climate, urban congestion, population, pollution, industrialization, technological development, public policy, health, education, and employment. The underlying concept is that both economy and society are constrained by environmental limits. Sustainable development is subject to the same vagaries as the other terms discussed above. Often, it is applied in a context that might more aptly be referred to as sustainable growth.

The justification for focusing on sustainability is too obvious to require elucidation. Traditional economics made no distinction between consumption of renewable and non-renewable resources, between productive activities that enhance the environment and those that pollute or destroy it, between those that ensure the security of future generations and those that place human and other forms of life at dire risk. Although most measures of sustainability focus on ecological issues, we would argue that the term applies equally to the development of human capital, where issues such as assured access to education, vocational training, health care and employment opportunities as well as income distribution are also crucial.

Views on sustainability differ with regard to future generations. Advocates of “strong sustainability” argue that the aim must be to ensure that individual stocks of critical natural capital, such as biological diversity, ozone layer, and carbon cycle do not decrease over time as the result of global warming, ozone layer depletion, and land degradation, i.e. each individual critical natural capital has to be maintained. “Weak sustainability” defines the concept more broadly to encompass economic and social as well as environmental sustainability to ensure that the overall wealth of a society, i.e. the sum of human-capital, knowledge-capital and natural-capital do not decline over time.

In recent decades the concept of zero growth or de-growth has gained ground, as a stronger rejection of traditional economic growth. Degrowth challenges the necessity of current modes of consumption and advocates a return to voluntary simplicity of life style, relocalization of economic activities, and decreased energy and other resource consumption. It seeks to reverse national and global production and consumption trends to reduce the overall ecological footprint of human activity.

---

<sup>20</sup> Calculus and most mathematical models treat continuously varying phenomena. The catastrophe approach of French mathematician Rene Thom and his followers treats various sudden, catastrophic changes. The real behavior of economic development is not smooth. It is accentuated by dramatic sudden changes. Calculus was developed to treat classical mechanics, where from the saying that nature does not make jumps followed. Quantum physics does make jumps. So do markets, economies and societies.

<sup>21</sup> Brundtland, G.H. *et al.*, *Our Common Future*, Oxford University Press, 1987, 383.

## 8.5 *Quality of Life, Welfare and Well-being*

These three terms are sometimes used in combination or interchangeably to reflect the need for a major reorientation of public policy based on the view that economic growth is not an end in itself but a means to a greater end that encompasses social, political, cultural and even psychological needs, aspirations and values of individuals and the social collective. Actions that contribute to higher rates of economic growth and higher living standards may or may not enhance human welfare, well-being, and overall quality of life. The loss of leisure time and sense of community, breakdown of the family and social cohesion, rising incidents of divorce, crime and mental illness, deterioration of social and cultural values are common concerns. This concept emphasizes the value of non-market human activities that do not fall within the monetized economy, such as household and personal services provided by members of the family, home schooling, care for children and the elderly. This broader conception recognizes the value of intangible but vitally important elements of human life, including the sense of security, belonging, social acceptance, self-esteem, and personal fulfillment.

## 9. Alternative Indices

The debate regarding GDP has served a meaningful purpose by helping to shape broader, more sustainable, human-centered conceptions. It has also given birth to a wide variety of alternative indices, each intended to address one or more of the deficiencies inherent in GDP. For example, Eurostat monitors 11 major categories of sustainable development indicators related to socio-economic development, sustainable consumption and production, social inclusion, demographic changes, public health, climate change and energy, sustainable transport, natural resources, global partnership and good governance, but it considers each of them separately, rather than as a composite index.<sup>22</sup> Apart from this there have been numerous attempts to construct composite indices for economic welfare, sustainable development, quality of life and well-being. We examine a few of the most salient in this section.

### 9.1 *Human Development Index (HDI)*

UNDP's HDI is a composite statistic widely used by international organizations to evaluate and rank countries in terms of three main indicators of economic and social welfare — income, health and education attainments — utilizing readily available data. The income component adjusts per capita GDP as measured in constant international dollars at purchasing power parity (PPP) for inequality by discounting the income of countries that exceed the world average. Life expectancy at birth is used as an index of health. Educational attainments are measured by a weighted sum of literacy and gross enrollment rates at the primary, secondary and tertiary level, assigning two-thirds weight to the literacy subcomponent.

HDI is a relatively simple composite index with a transparent structure that readily lends itself to comprehension and analysis. It is primarily suitable as a normative tool for inter-country comparisons, especially those at the lower end of the scale, rather than as an aid to policy-formation and evaluation. It consists of three main sub-indices designed to measure per capita income, education and life expectancy, each on a scale from 0 to 1.0. Scores on

---

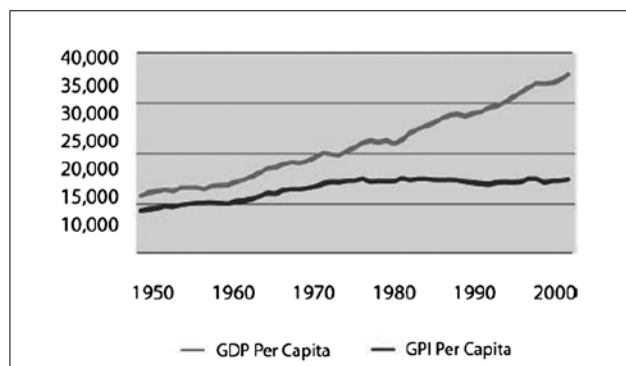
<sup>22</sup> European Commission, "The Sustainable Development Indicators". Accessed September 2, 2010, <http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators>.

the three sub-indices are averaged to arrive at an overall score for HDI.<sup>23</sup> Since it is based on GDP data, HDI is subject to the same limitations as GDP. The use of an abstract, arbitrary rating scale (0-100) makes it very difficult for the general public to relate to HDI's scores as a measure of welfare. The substantial weightage given to literacy (22.2%) seems inordinate considering that literacy is determined in many countries by the ability to read and write one's own name, while 11.1% is given to primary, secondary and tertiary school enrollment rates. HDI does not take into account income inequality or ecological factors.

## 9.2 Genuine Progress Indicator (GPI)

GPI is a complex, composite measure consisting of 51 indicators of economic welfare, sustainable development, social welfare and well-being, including consumption income, income inequality, consumer debt, underemployment, environmental degradation, breakdown of families, crime, and the value of non-monetized household and voluntary work. It is based on the personal consumption expenditure component of GDP. It measures changes in inequality rather than absolute levels of inequality based on the Gini coefficient and Income Distribution Index. It also takes into account the costs associated with pollution, resource depletion, crime, car accidents and other defensive expenditures, including loss of leisure time. GPI assigns and incorporates a dollar value for every year of higher education, household work, parenting, volunteering. While GDP data is widely interpreted to show a near tripling of per capita income in the USA during second half of the 20th Century, GPI shows 63% rise from 1950 to 1970, then a gradual leveling followed by flat or negative growth from 1980 to 2000 as shown in Figure 1. The difference between the measures is largely the result of rising marginal costs associated with income inequality, natural capital depletion, consumer durable expenditures, defensive expenditures, undesirable side effects of growth, and net foreign borrowing since 1980 as reflected in GPI.<sup>24</sup> Comparison between GDP and GPI serves as an argument that policy-making and decision-making based on the use of GDP may have been appropriate during 1950-1970, but have since become inadequate and counterproductive.

Figure 1: GDP per capita & GPI per capita 1950-2004 in \$2000



<sup>23</sup> UNDP, "Human Development Index: Methodology and Measurement", 1994. Accessed August 20, 2010, [http://hdr.undp.org/en/media/HDI\\_methodology.pdf](http://hdr.undp.org/en/media/HDI_methodology.pdf).

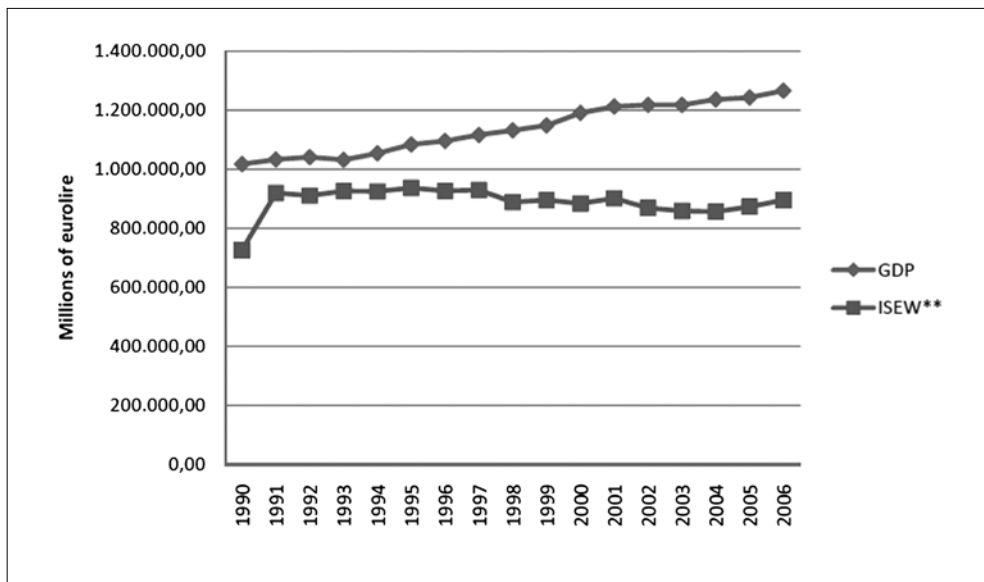
<sup>24</sup> Talberth, John., Cobb, Clifford., and Slattery, Noah. "The Genuine Progress Indicator 2006," *Redefining Progress*, February 2007. Accessed August 4, 2010, [http://www.lanec.edu/sustainability/documents/Talberth\\_Cobb\\_Slattery.pdf](http://www.lanec.edu/sustainability/documents/Talberth_Cobb_Slattery.pdf).

GPI is an admirable attempt to assess progress on a wide range of indicators related to human welfare and quality of life. Its main advantage is that, like GDP, it is a currency denominated index and bases itself on GDP consumption data. However, the necessity of combining indicators of economic, social and ecological indicators and of assigning arbitrary monetary value to a wide spectrum of immeasurable and intangible components diminishes its credibility as a real reflection of living standards. Thus far GPI calculations are available for only a handful of OECD countries and a few cities and regions within countries. The difficulty in obtaining reliable data and evolving internationally valid standards for interpretation on a very wide spectrum of economic and social variables, e.g. time spent volunteering, obesity, drug use and mental health make it unlikely that it will gain acceptance as an alternative measure of real economic performance.

### 9.3 Index of Sustainable Economic Welfare (ISEW)

ISEW is a variant of GPI and is also based on GDP personal consumption data. It makes modifications to take into account services that directly influence human welfare, e.g. public non-defensive expenditures, capital formation, domestic services, the cost of environmental degradation and depreciation of natural capital. It applies the Atkinson Index to correct for income inequality. ISEW calculations have been made for Austria, Chile, Germany, Italy, Netherlands, Sweden, Australia, Belgium, Italy and USA for the period 1950 to 2000. Figure 2 compares the performance of Italy from 1990 to 2006 as measured by GDP and ISEW.<sup>25</sup>

Figure 2: Performance of Italy 1990 to 2006 as measured by GDP & ISEW



<sup>25</sup> Carta, Valentina and Porcu, Mariano, "Measures of Wealth and Well-Being: A comparison between GDP and ISEW", *Working Papers 2010/06*, Centro Ricerche Economiche Nord Sud, Università di Cagliari, April 2010, 19.



#### *9.4 Weighted Index of Social Indicators (WISP)*

WISP is a composite index consisting of 40 economic and social indicators of development, welfare and well-being in 10 dimensions — economics, welfare, demography, education, health, environment, women's status, cultural diversity, social chaos, and defense. The economic sub-index includes GDP/capita, GDP growth rate, unemployment rate, external debt and Gini index as a measure of inequality. The index has been applied to rank the progress of 16 OECD and developing countries over the period 1970 to 2000. WISP arrives at scores for each of the sub-indices, which are statistically weighted by factor analysis based on an assessment of their relative contribution to social progress.

The utility of each of these and many other indices depends precisely on the intended application. GPI and ISEW require data on a wide range of factors that is only available in OECD countries. Data for HDI and WISP are available for all countries. GPI and ISEW can provide useful insights into changes over time within specific OECD countries, regions and urban areas, but are not suitable for cross-country comparisons on a global scale. GPI and ISEW both retain currency value as the unit of measure and GDP consumption related expenditure as the base. HDI and WISP utilize numerical scales unrelated to currency value. HDI is a narrow, partial measure of social development, while WISP is very broad, but lacks depth or precision in the dimensions it encompasses.

This brief summary of concepts and composite indices is intended to emphasize the complexity of the challenge we face in striving to evolve more effective measures and the inherent ambiguity of the terms used to describe various conceptions. Each of the composite indices reviewed above incorporates a range of variables that span multiple dimensions of social progress — economic welfare, development, sustainability, social welfare and well-being. The remainder of this article focuses on a narrower range of issues more strictly confined to measurement of economic welfare and proposes an alternative composite index somewhat narrower in scope but more proximate in its utility to GDP per capita.

### **10. Components of Economic Welfare**

Much of the criticism of GDP as a measure centers around the way it accounts or fails to account for important attributes of economic welfare. In this section we examine the most prominent of these attributes and discuss the desirability and feasibility of effectively incorporating them in a composite index suitable for both cross-country and historical comparisons.

#### *10.1 Household Income and Consumption Expenditure*

GDP per capita takes into account the value of all financial transactions at market prices, including categories of expenditure such as military spending and general administration that are not directly related to household income and expenditure. Human economic welfare can be more accurately assessed by focusing on that portion of national income which relates directly to households, namely disposable income, consumption expenditure and net savings plus that portion of government expenditure related to health, education, housing, environment and social welfare.

For cross-country comparisons, the most widely available and reliable data concerns

household consumption expenditure (HCE) and human welfare-related government expenditure (HWGE), which includes government expenditure on education (Ed), health (He), housing and community amenities (HC), social protection (SP), environmental protection (EP), recreation, culture and religion (RCR). This omits expenditure on general public services, defense, public order and safety, and economic affairs. The sum of the above two components is divided by the total population to derive per capita human welfare consumption expenditure (HWE/c), which is converted to PPP constant international dollars to facilitate cross-country and historical comparisons.<sup>26</sup>

$$HWE = \frac{HCE + HWGE (Ed + He + HC + SP + EP + RCR)}{(I)}$$

When applied to a cross-section of OECD and developing countries, we find that the value of HWE ranges from a low of 41% of GDP in China to a high of 88% in Russia, but for most of the sample countries it falls between 60 and 80%. HCE omits information regarding NHS, net household savings after deducting the total of all debt by households in the country, a crucial piece of information needed to assess overall human welfare and progress. Net household savings reflects the amount of financial capital available for investment by households in their future economic welfare. Combining household expenditure and household savings, we derive personal disposable income per capita (PDI):  $PDI = HCE + NHS$ .

Table 1 compares total GDP per capita in 2005 international dollars with human welfare-related household consumption expenditure (HCE/c), welfare-related government expenditure (HWGE/c), net household savings (NHS/c) and personal disposable income (PDI). India has the lowest GDP per capita, 45% less than China's, but India's PDI is only 10% lower. This dramatic change in relative welfare results because Chinese households receive only 50% of national income as PDI whereas Indian households receive 82%. This is consistent with the frequent assertion that growth of real wages is being suppressed by undervaluation of China's currency.<sup>27</sup> China's low HCE is offset by a high rate of capital formation (40%), which is twice the USA level and nearly three times the level in Russia, reflecting a strong political commitment to investment in GDP growth. China's low level of household consumption expenditure and relatively high household savings rate (24%) is fueled by uncertainty over provision of pensions, and the rising costs of healthcare and education.<sup>28</sup> Government welfare-related expenditure (HWGE) is nearly the same in both countries as a percentage of GDP and India's net household savings rate (30%) is 6% higher. These facts indicate that human economic welfare in India and China is much more similar than the wide gap that GDP figures reflects, but they do not invalidate China's remarkable economic gains. They only suggest that a larger proportion of those gains have thus far gone for investment in public goods than for the personal consumption and welfare. It may be justifiable as a temporary expediency, but as a long term strategy it can be used to subordinate human welfare to national economic and political power.

<sup>26</sup> The analysis done in this paper is focused on per capita human economic welfare. Therefore all the major terms are per capita terms (whether or not it is specifically stated) except where aggregate figures are necessary for purposes of comparison or calculation.

<sup>27</sup> Krugman, Paul. "Japan, China and America," New York Times, September 13, 2010.

<sup>28</sup> Aziz, Jahangir., and Cui, Li. "Explaining China's Low Consumption: The Neglected Role of Household Income," IMF Working Paper, Asia and Pacific Department, WP/07/181, 2007, 4.

*Table 1: Values for GDP per capita (GDP) vs. household consumption expenditure per capita (HCE), welfare-related government expenditure per capita (HWGE), net household savings per capita (NHS) and personal disposable income per capita (PDI) in 2005 international dollars PPP. Values are for the year 2005.*

A	B	C	D	E	F	G	H	I	J	K
Country	GDP	HCE	HCE as % of GDP	HWGE	HWGE as % of GDP	Total Govt Exp as % of GDP	NHS as % of PDI	NHS	PDI	PDI as % of GDP
India	2,234	1,284	57%	71	3%	10%	0.30	537	1,821	82%
China	4,076	1,535	38%	151	4%	14%	0.24	485	2,019	50%
Brazil	8,505	5,077	60%	416	5%	15%	0.07	382	5,459	64%
So. Africa	8,504	5,776	68%	773	9%	19%	0.00	6	5,782	68%
Turkey	10,977	7,462	68%	322	3%	9%	0.10	829	8,291	76%
Russia	11,861	9,233	78%	1,252	11%	19%	0.13	1,331	10,564	89%
Mexico	12,563	8,827	70%	519	4%	6%	0.07	664	9,492	76%
Croatia	14,271	8,658	61%	1,822	13%	19%	0.00	9	8,667	61%
Korea,Rep	22,783	10,568	46%	1,095	5%	10%	0.11	1,306	11,875	52%
Spain	27,377	16,467	60%	3,469	13%	19%	0.11	2,102	18,569	68%
Italy	28,144	16,165	57%	3,326	12%	19%	0.16	3,040	19,205	68%
Japan	30,310	16,331	54%	3,405	11%	17%	0.01	240	16,571	55%
Germany	31,378	17,955	57%	4,288	14%	19%	0.16	3,494	21,449	68%
Sweden	32,319	14,834	46%	5,252	16%	22%	0.08	1,350	16,183	50%
UK	32,690	21,481	66%	3,917	12%	18%	0.04	883	22,364	68%
US	41,833	29,398	70%	2,305	6%	14%	0.00	118	29,516	71%

At the upper end of the income spectrum, the GDP of first ranked USA is 28% higher than second ranked UK, while its household consumption expenditure (HCE), which constitutes 70% of GDP, is 37% larger than UK's, which constitutes 66% of GDP. However, when government welfare-related expenditures (HWGE) are taken into account, the gap declines, since HWGE in the UK is 12% of GDP compared to only 6% in USA. UK savings rate was 4% compared with a zero net household savings rate in the USA throughout the first half of the decade due to a rising level of household debt. Overall, UK spends 78% of GDP on human economic welfare (HWE) compared to 76% in USA. Thus, even though PDI is 32% higher in USA, its actual HWE is only 25% higher than UK. As we shall see, the gap in welfare between these countries shrinks even further when other aspects of human welfare are taken into account. In contrast, the GDP of third ranked Germany is 33% lower than USA, while its HWE is 43% less, in spite of the fact that HWGE in Germany (14%) is more than twice the USA level. This is explained by the fact that Germans receive a 13% lower share in national income but save a very high portion of what they receive (16%).

Among OECD countries, PDI ranges from a low of 50% of GDP in Sweden to a high of 76% in Mexico and Turkey. As expected, Sweden has the highest rate of HWGE at 16% as well as the highest proportion of overall government expenditure, 50% higher than in the USA, offset by smaller share of household consumption in GDP.<sup>29</sup> Russia's high HCE, HWGE and PDI as a percentage of GDP result from 10 percent growth rate in incomes, a doubling of real incomes and halving of the poverty rate since 2000, a 10% decline in the proportion of income spends on food from 1993-2003, an 18% compounded increase in consumer spending since 2004 reflective of a growing middle class, combined with a low flat rate 13% income tax, subsidized for housing and utilities equivalent of 20% of household

<sup>29</sup> Mukkai, Saraswathi, "Human Welfare, Consumption & Income Inequality", *MSS Research Working Papers*, The Mother's Service Society, September 2010. Accessed August 5, 2010, [http://mssresearch.org/?q=Human\\_Welfare\\_Consumption\\_Income\\_Inequality](http://mssresearch.org/?q=Human_Welfare_Consumption_Income_Inequality).

income, a 13% savings rate, rising oil prices during that period and rising levels of direct foreign investment.<sup>30,31</sup> A recent study attributes the very high level of household consumption as a percentage of income to large-scale under-reporting of income data by households.<sup>32</sup> This analysis is intended to bring out the variety of factors that determine the relationship between GDP and human economic welfare and the fallacy of trying to deduce welfare based solely on per capita GDP.

These differences point to the need for economic theory and measurement to openly adopt a position on the purpose of economic growth and development. Like any human activity that loses sight of its central purpose and place in the wider scheme of social existence, economic growth for its own sake is subject to diminishing returns and potentially disastrous consequences. Here we are not dealing with impersonal values that are the creation of physical nature, but rather personal values which are wholly the creation of human beings and need to reflect universal human aspirations. We have both the capacity and a responsibility to redefine our concepts to reflect human values. After suffering from scarcity for millennium, it was natural of people to assume that more is always good. Today we are faced with the fallacy in the facile assumption. Everywhere we confront the consequences of unconscious and unconscionable excess that depletes the abundant riches of our natural environment, while concentrating destabilizing accumulations of wealth among the few, an essential cause for the Great Crashes of 1929 and 2008.

## 10.2 Income Inequality

One of the serious criticisms of GDP is its blatant disregard of income distribution. In recent decades income inequality has risen — in many cases sharply — in most countries in the world. From the 1960s to the 1990s, inequality declined in only 9 out of 73 countries for which data is available.<sup>33</sup> The significance of disregarding the impact of income distribution on economic welfare can be illustrated with reference to the USA, where income inequalities are at their highest levels since 1929.<sup>34</sup> In 1979, the richest 1% of American families took in about 9% of the nation's total income; by 2007, the top 1% took in 23.5% of total income. During this period, the after-tax income of this group rose by 281%, whereas the growth of the middle fifth of households averaged only 25% and the bottom fifth only 16% as shown in Figure 3.<sup>35</sup> At the very least this figure shows the illusory effect of regarding growth of GDP as synonymous with increasing general welfare. In simple terms, this means that the good news about economic progress over the past three decades applied almost exclusively to a small portion of the entire population. Krugman estimates that perhaps as much as 70% of all of the income growth in the United States during the 1980s went to the richest 1% of all families.<sup>36</sup>

<sup>30</sup> "Russia: Shoppers Gone Wild", Bloomberg Business Week, Feb 20, 2006. Accessed September 1, 2010. [http://www.businessweek.com/magazine/content/06\\_08/b3972071.htm](http://www.businessweek.com/magazine/content/06_08/b3972071.htm).

<sup>31</sup> Notten, Gerander, and Denis de Crombrughe, "Poverty and Consumption Smoothing in Russia", Maastricht Graduate School of Management, *Working Paper*, MGSOG/2006/WP004, 2006. Accessed September 12, 2010, <http://www.governance.unimaas.nl/home/publications/2006WP004.pdf>.

<sup>32</sup> Gorodnichenko, Yuriy., Klara Sabirianova Peter and Stolyarov, Dmitriy, "Inequality and Volatility Moderation in Russia: Evidence from Micro-Level Panel Data on Consumption and Income", *Discussion Paper*, No. 4233, Institute for the Study of Labor (IZA), Germany, June 2009, 14. <http://ftp.iza.org/dp4233.pdf>.

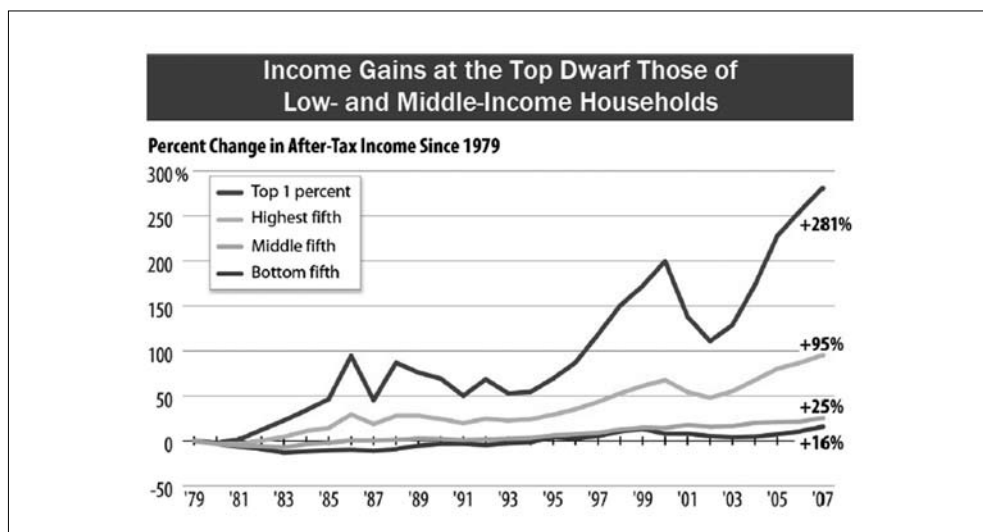
<sup>33</sup> Cornia, Giovanni Andrea and Court, Julius "Inequality, Growth and Poverty in the Era of Liberalization and Globalization", *WIDER Policy Brief*, No. 4, Helsinki: United Nations University World Institute for Development Economics Research, 2001, 12. Accessed June 14, 2010, [http://www.wider.unu.edu/publications/policy-briefs/en\\_GB/pb4/\\_files/78807311723331954/default/pb4.pdf](http://www.wider.unu.edu/publications/policy-briefs/en_GB/pb4/_files/78807311723331954/default/pb4.pdf)

<sup>34</sup> Piketty, Thomas and Saez, Emmanuel, "Income Inequality in the United States, 1913 to 1978", National Bureau of Economic Research *Working Paper* 8467, USA, 2001. Accessed August 22, 2010, <http://www.nber.org/papers/w8467.pdf>.

<sup>35</sup> Sherman, Aloc., and Stone, Chad, "Income gaps between very rich and everyone else more than tripled in last three decades", Center on Budget & Policy Priorities, USA, June 25, 2010, Accessed August 4, 2010, <http://www.cbpp.org/files/6-25-10inc.pdf>.

<sup>36</sup> Krugman, Paul. "The Rich, the Right, and the Facts," *The American Prospect*, 11 (1992): 19-31.

Figure 3: Percent Change in After-Tax Income since 1979 in USA



Thus, it is evident that income distribution is an important determinant of the impact of economic growth on economic welfare. As Stiglitz, Sen and Fitoussi observe in the report of the Commission on the Measurement of Economic Performance and Social Progress, “When there are large changes in inequality (more generally a change in income distribution), gross domestic product (GDP) or any other aggregate computed per capita may not provide an accurate assessment of the situation in which most people find themselves. If inequality increases enough relative to the increase in average per capita GDP, most people can be worse off even though average income is increasing.”<sup>37</sup>

### 10.2.1 Impact of Inequality on Economic Welfare

High levels of inequality are associated with a wide range of social ills. Studies in the USA show that states with greater inequality in the distribution of income also had higher rates of unemployment, higher rates of incarceration, a higher percentage of people receiving income assistance and food stamps, and a greater percentage of people without medical insurance. The gap between rich and poor was the best predictor of these problems, not the average income in the state. In addition, states with greater inequality of income distribution also spent less per person on education and had lower school completion rates, poorer educational performance, a greater proportion of babies born with low birth weight, higher rates of homicide, higher rates of violent crime, a greater proportion of disabled workers, and a higher proportion of the population being inactive.<sup>38, 39</sup>

<sup>37</sup> Stiglitz, Joseph E., Sen, Amartya and Fitoussi, Jean-Paul, *Report by the Commission on the Measurement of Economic Performance and Social Progress*, 2009, 8, Accessed August 4, 2010, [http://www.stiglitz-sen-fitoussi.fr/documents/rapport\\_anglais.pdf](http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf).

<sup>38</sup> Yates, Michael, “Poverty and Inequality in the Global Economy”, *Monthly Review*, 55 (2004):9. Accessed February 14, 2010, <http://monthlyreview.org/0204yates.htm>.

<sup>39</sup> Yates, Michael, *Naming the System: Inequality and Work in the Global Economy*, New York: Monthly Review Press, 2003, 58-60, quote from Peter Montague, “Economic Inequality and Health.”

While income inequality is considerably lower in countries such as Germany and Japan than it is in USA, it is even higher in Argentina, Brazil, Malaysia, Mexico, and South Africa and only marginally lower in China and Russia. Indeed, the same distorting impact of income inequality on the validity of per capita GDP is universal. Internationally, high levels of inequality are also associated with lower levels of economic growth, decreasing life expectancy, poorer educational performance, increasing crime rates, higher levels of corruption, and increased macro-economic instability, as well as low levels of development of human capital.<sup>40</sup> Wilkinson and Pickett found that the incidence of health and social problems is higher in countries with higher levels of inequality.<sup>41</sup> Countries at the same level of per capita income vary widely in health and social problems due to differences in income distribution. Income inequality is a more accurate predictor of problems than actual level of income.<sup>42</sup>

More equitable distribution is linked to higher levels of economic growth. IMF research confirms the “growing recognition that an excessively unequal income distribution may itself be detrimental to sustainable growth.”<sup>43</sup> High inequality reduces economic development by slowing poverty eradication, retarding investments in education, and inhibiting entrepreneurship.<sup>44</sup> World Bank and others have drawn attention to health as a factor in economic development.<sup>45</sup> Health is an important determinant of the productivity of human capital. Fogel found that one third or more of the economic growth in England over the past two centuries was attributable to improvements in nutrition.<sup>46</sup> As we have shown above, inequality has detrimental effect on health and life expectancy, thereby decreasing economic growth. Bloom and Canning found that an extra year of life expectancy is associated with a 4% rise in per capita GDP in the long run.<sup>47</sup> They argue that healthy individuals are more efficient at assimilating knowledge and, in consequence, attain higher productivity levels.<sup>48</sup> Employment and income distribution are also closely related. While employment rates and incomes levels tend to be high for educated and skilled workers, unemployment and underemployment are much higher for those with lower levels of educational attainment, especially among youth, the poor and the unskilled in many countries.

High levels of inequality are also associated with economic instability. Rising levels of income inequality result in the increasing concentration of wealth, a major source of international currency flows and speculative investments and a contributor to traumatic economic events. Since the rich spend a much smaller proportion of their incomes than other income groups, a rise in income at the top creates fewer jobs and slower growth. In addition much of their earnings are invested in commodities, stocks and real estate, a stimulus to price bubbles.<sup>49</sup> The period 1910-1929 leading up to the Great Crash in the USA was characterized

<sup>40</sup> International Labour Organization. “World of Work Report 2008: Income Inequalities in the Age of Financial Globalization”, International Institute for Labour Studies: Geneva, Switzerland, 2008, 2, 23. Accessed July 28, 2010.

<sup>41</sup> Wilkinson, R. and Pickett, K. *The Spirit Level: Why Equality is Better for Everyone*, Penguin: London, UK, 2009.

<sup>42</sup> Aguayo-Rico, A., Guerra-Turrubiates, I.A., Montes, R. “Empirical Evidence of the Impact of Health on Economic Growth”, *Issues in Political Economy*, 14 (2005). Accessed June 4, 2010, <http://org.elon.edu/ipe/aguayorico%20final.pdf>.

<sup>43</sup> Camdessus, Michael. Opening Remarks, International Monetary Fund, June 1, 1995, Accessed July 7, 2010, <http://www.imf.org/external/np/sec/mds/1995/mds9509.htm>.

<sup>44</sup> Ramcharan and Rodney, “Inequality Is Untenable”, *Finance & Development*, 47 (2010), IMF, September 2010.

<sup>45</sup> Rivera, B. and Currais, L. “The Effect of Health Investment on Growth: A Causality Analysis”, *IAER*, 9 (2003): 312-324.

<sup>46</sup> Fogel, R.W. “Nutrition, Physiological Capital, and Economic Growth.” Presented at Senior Policy Seminar on Health, Human Capital and Economic Growth: Theory, Evidence and Policies of the Pan American Health Organization (PAHO) and Inter-American Development Bank (IADB), Washington, DC, USA, October 2002. Accessed June 3, 2010, <http://www.paho.org/English/HDP/HDD/fogel.pdf>.

<sup>47</sup> Bloom, D.E., Canning, D., Sevilla, J., “The Effect of Health on Economic Growth: A Production Function Approach”, *World Development*, 32 (2004): 32, 1-13.

<sup>48</sup> Bloom, D.E., Canning, D. “The Health and Wealth of Nations”, *Science*, 287 (2000): 1207-1209.

<sup>49</sup> Reich, Robert B. “How to End the Recession”, *The New York Times*, Sept. 2, 2010. Accessed August 4, 2010, <http://www.nytimes.com/2010/09/03/opinion/03reich.html>.

by a near doubling of the share of income going to the top 1% of the income distribution. In the 1920s, 5% of Americans earned a third of the total national income and the top 1% owned an all-time-high 36% of the nation's assets.<sup>50</sup> The same phenomenon repeated during the period 1989-2008 immediately preceding the current international financial crisis. Meanwhile, household debt in the USA as a share of GDP increased by 50%. While in 1987 the bottom half of American households' debt was roughly equivalent to its net wealth, in 2008 its debt was twice the value of its net wealth.<sup>51</sup>

Over the past decade, a similar imbalance has occurred internationally, leading to what has been aptly termed a global savings glut. It has been accompanied by weak investment and sluggish consumption.<sup>52</sup> From 1980 to 2006, total international financial flows rose from \$12 trillion to \$167 trillion, a fourteen-fold increase in 26 years, equivalent to almost three times total world GDP. Since 2004, currency trading has soared 69% to over \$4 trillion per day.<sup>53</sup> In 2000, the financial assets held by the wealthiest 7.2 million individuals in the world, representing 0.1% of the world's population, were valued at US\$27 trillion, equivalent to almost half of the entire world's GDP (\$61 trillion). The assets of the top 200 richest people amount to more than the combined income of 41% of the world's population.<sup>54</sup> Of course, not all concentration of wealth is detrimental to social progress. It is also the source of huge philanthropic endowments in support of health, education, research and cultural activities by well-known foundations such as Carnegie, Rockefeller, Gates and many others. Charitable donations in the USA were over \$300 billion in 2009, equivalent to 2.2% of GDP or about 10% of the total PDI of the top 20% of US households.<sup>55</sup> Although 89% of American households give to charity, a large portion of this comes from the top income group.

The impact of income inequality on economic growth and human welfare consumption expenditure is complex and difficult to isolate from innumerable other factors. But the notion that high levels of inequality are necessary for high rates of economic growth is clearly not valid. During the period 1950 to 1973, a period of falling inequality within most countries, the world experienced the fastest rates of economic growth in recorded history, with the exception of subsequent achievements by the Asian Tigers. In contrast, the post-1973 has seen much slower rates of economic growth amid rising levels of income inequality.<sup>56</sup> It is equally evident that high levels of inequality can curtail human economic welfare, as when rural land assets are concentrated in the hands of a landlord class employing landless laborers at subsistence wages. High income inequality can also retard investments in human capital, which are essential for rising living standards.

The importance of measuring income inequality is heightened in an age of globalization. Even while inter-country inequalities have declined in some cases, studies by Cornia and

<sup>50</sup> For incisive analysis of inequality and its economic consequences: X. Sala-i-Martin "The World Distribution of Income - Falling Poverty and Convergence Period", Quarterly Journal of Economics, May 2006; B. Milanovic, "Worlds Apart: Measuring International and Global Inequality", Princeton Univ. Press, Princeton, 2005; "Where in the world are you", World Bank Working Paper, Dec 2007; and "An even higher global inequality than previously thought", Dec 2007.

<sup>51</sup> Oman, William. "Does income inequality increase economic and financial instability?" Global Policy Journal, September 6, 2010. Accessed September 5, 2010, <http://www.globalpolicyjournal.com/blog/06/09/2010/does-income-inequality-increase-economic-and-financial-instability>.

<sup>52</sup> Lipsky, John. "Financial Market Turbulence and Global Imbalances," Conference on European Economic Integration, IMF, November 19, 2007. Accessed July 5, 2010, <http://www.imf.org/external/np/speeches/2007/111907.htm>.

<sup>53</sup> Lauricella, Tom., and Dave Kansas. "Currency Trading Soars", Wall Street Journal, Sept 1, 2010. Accessed August 6, 2010, <http://online.wsj.com/article/SB10001424052748704421104575463901973510496.html>.

<sup>54</sup> International Development Economics Association. "Globalisation and Income Inequality: A Survey." Accessed August 14, 2010, [http://www.networkideas.org/feathm/aug2002/ft19\\_Globalisation\\_Survey.htm](http://www.networkideas.org/feathm/aug2002/ft19_Globalisation_Survey.htm).

<sup>55</sup> Giving USA Foundation, "U.S. Charitable Giving Estimated to Be \$307.65 Billion in 2008", Accessed August 10, 2010, [http://www.philanthropy.iupui.edu/News/2009/docs/GivingReaches300billion\\_06102009.pdf](http://www.philanthropy.iupui.edu/News/2009/docs/GivingReaches300billion_06102009.pdf).

<sup>56</sup> Lee, Marc. "The global Divide: Inequality in the World economy", *Behind the Numbers, Economic Facts Figures and Analysis*, 4 (2002).

Kiiski and others have found increased intra-country inequalities.<sup>57</sup> While the progress of China over the past 35 years is largely responsible for the reduction in cross-country inequality, intra-country income inequality within China as measured by the Gini coefficient rose 30% from 1980 to 2005.<sup>58</sup> Intra-country inequality is also increasing among the wealthiest countries. As UNDP has pointed out, in 1960 the top 20% of the world's people in the richest countries had 30 times the income (in terms of total GDP) of the poorest 20%. This grew to 32 times in 1970, 45 times in 1980, and 59 times in 1989. By 1997, the top 20% received 74 times the income of the bottom 20%. While economic growth in the 19th century was largely driven by increasing capital investment in industry, we now live in a world of excess production capacity where growth depends primarily on increasing levels of consumption expenditure, which means that the greatest benefit will accrue from raising the incomes of the 2.8 billion people living on less than \$2 per day, who have the highest marginal propensity to consume.<sup>59</sup>

### 10.2.2 Theories of Income Inequality

Rising levels of inequality result from multiple causes, including a rising share of capital in total income as well as increases in earnings inequality, rural-urban and regional differences, technology change, trade and financial liberalization, privatization, taxation policies and change in labour market institutions.<sup>60</sup> It is evident that new economic theory is needed to explicate the relationships between these factors and that new empirical research is needed to measure its expressions in different countries and under different circumstances.

Barro cites four broad categories of economic theory that have been constructed to assess the macroeconomic relations between inequality and economic growth. These theories can be classed according to the main feature stressed: credit-market imperfections, political economy, social unrest, and saving rates. As he observes, each of these theories has offsetting effects that lead to ambiguous conclusions. Based on his empirical research, Barro concluded that income-equalizing policies might be justified on growth promotion grounds in poor countries, but not necessarily in more prosperous countries.<sup>61</sup>

A true perspective on the role of inequality can only emerge when this issue is viewed from the wider perspective of social development theory. Differences in levels of accomplishment can ignite aspirations and act as a powerful spur to growth and development, provided the distance and obstacles are not so great as to discourage effort and generate alienation. Much more theoretical and empirical work is needed regarding the impact of economic inequality on overall levels of economic welfare, sustainable social development, human welfare and well-being. Both theoretical and practical efforts to assess the real impact of economic activity on human welfare at the household level necessitate the inclusion of some measure of income distribution.

---

<sup>57</sup> Cornia, Giovanni Andrea and Kiiski, Sampsa, "Trends in Income Distribution in the Post-World War II Period: Evidence and Interpretation", *WIDER Discussion Paper*, No. 89, Helsinki: United Nations University World Institute for Development Economics Research, 2001.

<sup>58</sup> Wolf, Martin, "The Big Lie of Global Inequality," *Financial Times*, February 8, 2000.

<sup>59</sup> UNDP, "Human Development Report 1999", United Nations Development Programme. Accessed July 13, 2010, [http://hdr.undp.org/en/media/HDR\\_1999\\_EN.pdf](http://hdr.undp.org/en/media/HDR_1999_EN.pdf).

<sup>60</sup> Cornia and Court, *op.cit.*, p. 12-22.

<sup>61</sup> Barro, Robert J. "Inequality and Growth in a Panel of Countries", *Journal of Economic Growth*, 5(2000): 5-32. Accessed August 10, 2010, [http://www.economics.harvard.edu/faculty/barro/files/p\\_inequalitygrw.pdf](http://www.economics.harvard.edu/faculty/barro/files/p_inequalitygrw.pdf).



### 10.2.3 Measuring Income Inequality

Many economists have long been arguing for inclusion of income distribution in measures of human welfare. The Gini coefficient is the most frequently-used index for assessing differences in inequality between countries and over time. But Gini is a stand-alone figure that is not based on any distributional model. Nor does it tell us where within a population the inequality occurs or the impact of that inequality on human economic welfare of the society. Based solely on net household income, Gini does not accurately reflect differences in wealth. Some countries with a relatively low coefficient of inequality for income have a much higher coefficient for inequality of wealth. Nor does it reflect differences in inequality of opportunity arising from social barriers to upward mobility. In addition, Gini does not take into account non-monetized goods and services, such as the consumption of home-grown food, which is very high among the rural poor in many countries, e.g. estimated at 25% in Russia.

Other measures of inequality are subject to similar constraints. The quintile or weighted average method, Atkinson method and max-min method apply alternative approaches which explicitly introduce distributional objectives into measures of inequality. Jorgenson showed how information about consumption expenditure and aversion towards inequality can be combined to yield a measure of living standards.<sup>62</sup> Other measures of inequality include the Hoover Index and Theil Index, each with its own utility and limitations. Hoover measures the proportion of all income which would have to be redistributed to achieve a state of perfect equality on a scale of 0 (perfect equality) to 1 (maximum inequality). Theil is a measure of distributional entropy on a scale of 0 to 1. It takes an 18:82 ratio of income distribution as equal to 0 and a state of maximum entropy in which income earners cannot be distinguished by their resources as equal to 1. Theil has the added characteristic of being decomposable to distinguish between inequality in different sub-regions.<sup>63</sup> The Atkinson Index has the ability to gauge movements in different segments of the income distribution. It can be converted into a normative measure by imposing a coefficient to weight incomes. UNDP and Eurostat monitor inequality by the ratio of total disposable income received by the 20% of the population with the highest income (top quintile) to that received by the 20% of the population with the lowest income (lowest quintile).

Gini measures differences in income between a state in which all households in the population have the same income and the Lorenz curve which measures the actual distribution. Country scores on the Gini index range from a low of 23 in Sweden to a high of 60 or more in several African nations. The quintile dispersion method shows that the ratio of the lowest to highest income groups ranges from 3.4 in Japan, 4.3 in Germany, and 4.9 in India, to 8.4 in USA, 10.7 in China, 23.7 in Brazil and 57.6 times in Sierra Leone.<sup>64</sup>

Most of these indices are based on complex statistical calculations and summarize inequality in the entire income range. Each provides some insight into the extent and distribution of inequality, but they are not strictly comparable because they have different levels of sensitivity to incomes in different parts of the distribution.<sup>65</sup> For example, Theil and Hoover give contrasting results depending on whether the income distribution is characterized

<sup>62</sup> Jorgenson, D.W. "Consumer Behaviour and the Measurement of Social Welfare", *Econometrica*, 58(1990): 1007-1040.

<sup>63</sup> Chaudury, Sunil, *Global Encyclopaedia of Welfare Economics*, New Delhi: Global Vision Publishing House, 2009, 144-145.

<sup>64</sup> UNDP, "Human Development Report 2006", *United Nations Development Programme*, p. 335.

<sup>65</sup> Litchfield, Julie A., "Inequality: Methods and Tools", *World Bank*, 4. Accessed July 16, 2010, <http://siteresources.worldbank.org/INTPGI/Resources/Inequality/litchfie.pdf>.

by high or low levels of inequality. Atkinson's sensitivity varies according to the level of inequality and weight assigned to the normative coefficient. Ryscavage applied four of these indices to measure income inequality in the USA from 1967 to 2006 and found significant variations both in the extent of inequality recorded as well as the rate of change over time.<sup>66</sup>

One limitation of these methods is that they generate a separate score for income inequality but do not correlate it with actual income level. To overcome this limitation, in 1976 Amartya Sen proposed the Social Welfare Function (SWF), which multiplies mean per capita GDP by one minus Gini to arrive at an adjusted per capita income.  $SWF = GDP/c * (1-G)$ . An advantage of this approach is that it is a real-valued function which enables monitoring of changes in per capita income in a manner that more closely approximates the actual impact on the majority of households. SWF is a measure of both equality and efficiency. It reflects both overall economic performance as well as income distribution. It can rise as a result either of higher economic performance or more equitable distribution. Mukhopadhaya has proposed an alternative SWF to eliminate its inherent bias toward higher income groups.<sup>67</sup>

#### 10.2.4 Maximizing Growth & Equality

Like other measures of inequality, Sen's SWF is primarily intended to measure income distribution, not overall economic welfare. There is no justification for concluding that such a perfect state of equality as measured by Gini would lead to the optimal level of economic welfare for the population as a whole. Rather it may lead to a state in which on average everyone is equally less well off. For these reasons, SWF cannot be regarded as an effective measure of human welfare, even if it is found to be an accurate index of income inequality. Moreover, different measures of inequality result in different SWF functions. To illustrate, we compared SWFG based on Gini with SWFT, a similar function using the Theil Index for several countries based on data for the year 2000. For Brazil, SWFT was more than twice as large as SWFG. For UK, it was 46% larger.

Promoting greater political, economic and social equality are valid goals in their own right. But our objective here is more limited. It is to measure overall economic welfare, rather than income inequality or social equity. Income inequality, like social status and other forms of social differential, plays both a positive and a negative role in development, as a stimulus to social aspirations and as an impediment to the full and effective utilization of national wealth for human welfare. As Raghuram Rajan, former IMF Chief Economist, observes in his recent book *Fault Lines*, "Not all forms of income inequality are economically harmful. Higher wages serve to reward the very talented and hardworking, identify the jobs in the economy that need the most skills, and signal to the young the benefits of investing in their own human capital. A forced equalization of wages that disregards the marginal contribution of different workers will deaden incentives and lead to a misallocation of resources and effort."<sup>68</sup>

Although we know that not all income inequality can be considered detrimental to economic welfare, the precise relationship between equality and efficiency is complex and unknown. We cannot assume that a completely equal distribution of income would lead

<sup>66</sup> Ryscavage, Paul, *Rethinking the Income Gap*, New Jersey : Transaction Publishers, 2009, 31.

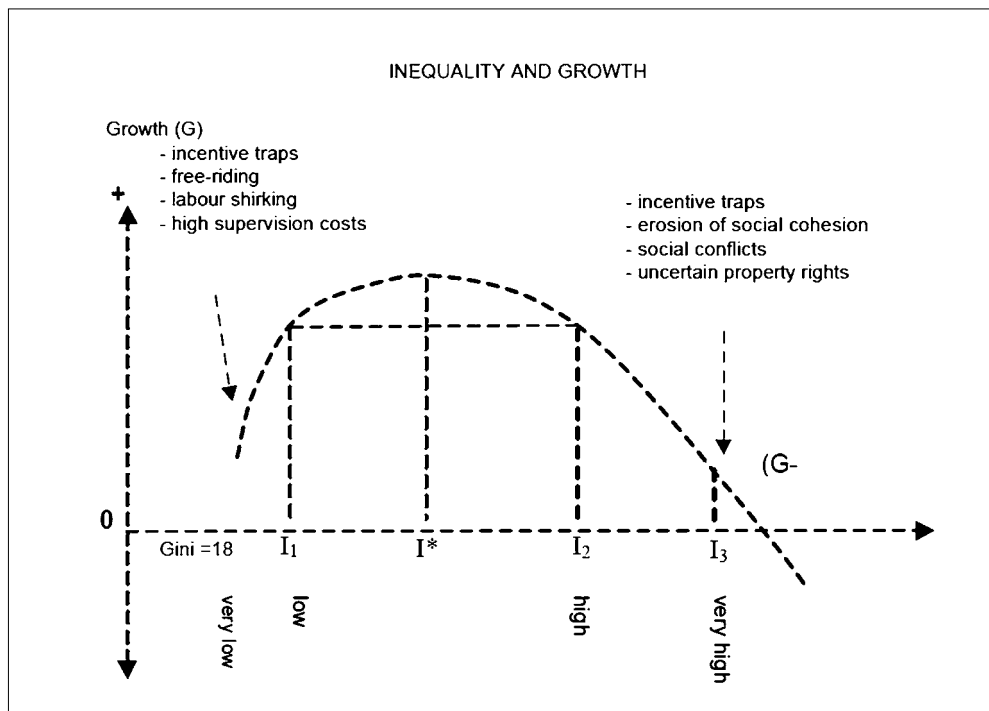
<sup>67</sup> Mukhopadhaya, Pundarik, "Efficiency Criteria and the Sen-type Social Welfare Function", *Working Paper*, No. 0114, Department of Economics, National University.

<sup>68</sup> Rajan, Raghuram, *Fault Lines*, Princeton University Press, 2010, 183.

to optimum social benefits, since beyond a certain level greater equality may discourage innovation, initiative and incentives for higher performance. Indeed, differences in level of attainment act as an essential stimulus to economic progress, as they do to progress in all fields of human activity. We may find, for instance, that the reductions in the income differences between the top and bottom income groups of a population result in higher levels of consumption and employment generation, whereas reduction of inequalities within each subset of total population reduce the motivation for higher performance. Thus, we need to take into account both the negative and positive effects on inequality on human economic welfare.

Cornia and Court address the complex relationship between inequality and growth. They define an 'efficient inequality range' as an inequality range that is most efficient for economic growth as depicted in Figure 4. They postulate that this range probably lies somewhere between a Gini value of 0.25 typical of Northern European countries and value of 0.40 in USA and Russia. "Any country that intends to maximize poverty reduction should choose the lowest level of inequality (I1) within the efficient inequality range (I1-I2). Aiming for the lower end of range is important because one obtains the same level of growth at lower levels of inequality, but it allows the reduction of poverty at a faster rate."<sup>69</sup>

Figure 4: Inequality & Growth



<sup>69</sup> Cornia and Court, *op.cit.*, p. 27-28.

### 10.2.5 Economic Welfare Index

Note that both Sen's SWF as well as Cornia and Court's efficient inequality range focus on economic growth rather than economic welfare of individuals and households, which is the focus of this paper. For this reason, we support efforts to define a variant of the 'efficient inequality range' which is most conducive for human economic welfare, rather than growth per se. We recognize that this range may vary widely between different countries and conditions. Although the exact composition of the range is not known, we can readily conceive of a hypothetical balance between income distribution and incentives for income generation which might achieve the goal of optimizing human economic welfare for the society as a whole. Therefore, we need to adjust SWF for efficiency. We introduce a coefficient of efficiency  $e$ . The value of  $e$  ranges between 0 and 1. The lower the value of  $e$ , the higher the level of inequality required for optimal economic welfare. In addition, it is evident that countries which have already achieved low levels of inequality will have lower values of  $e$  than countries presently operating at high levels of inequality.

Our approach differs from Sen's SWF and others in one other important respect. The indices of inequality discussed above are typically applied to measure income inequality and take GDP as the base. Our objective here is to measure the impact of inequality on levels of welfare-related household consumption expenditure rather than income. Consumption inequality is typically lower than income inequality, because high income households consume a much lower percentage of their total income than low income households. For this reason, we cannot apply income inequality metrics to household consumption in their present form. We need to also adjust SWF by a coefficient  $c$  representing the difference between income inequality and consumption inequality in the population. In this paper we propose a new index, the Economic Welfare Index (EWI), which is a modification of Sen's SWF designed to reflect that portion of inequality which negatively impacts on economic welfare as measured by household consumption expenditure. EWI is derived by converting Gini into  $G_{ec}$  according to formula 2 below.<sup>70</sup>  $G_{ec}$  represents that proportion of the Gini coefficient which is compatible with optimal levels of economic welfare as measured by household consumption expenditure. Note that  $G_{ec}$  increases as Gini rises, reflecting the fact that high Gini countries have a greater potential for reducing inequality without dampening economic incentives that promote human welfare.

$$G_{ec} = 0.65 \text{ Gini} - 0.1$$

----- (2)

$G_{ec}$  is intended to measure income inequality against a standard of 'optimal welfare inequality', which can be defined as that the lowest level of inequality compatible with the highest level of overall human economic welfare for the society as a whole.

EWI is personal disposable income (PDI) multiplied by  $G_{ec}$  plus government welfare-related expenditure on households (HWGE). Note that HWGE is not adjusted by  $G_{ec}$  since the distribution of government services is far more equitable than the distribution of income and consumption expenditure and is skewed in favor of lower income families.

$$EWI = PDI (1 - G_{ec}) + HWGE$$

$$EWI = PDI (1.1 - 0.65G) + HWGE$$

----- (3)

---

<sup>70</sup> Gini values have been developed to measure both pre-tax and after-tax inequality. As far as possible, the Gini values used in this study are the after-tax values, since the objective is to measure the impact of inequality after taking into account transfers to and from government.

This equation adjusts PDI to take into account the impact of inequality on optimal economic welfare. Further research is needed to more precisely determine the value of  $G_{ec}$  under different circumstances.

Table 2 shows that when adjusted for inequality ( $G_{ec}$ ) per capita disposable income (col G - col D) declines by a minimum of 3% in Sweden and 5% in Korea to a maximum of 17% in Brazil and 23% in South Africa. The difference is reduced when we factor in the government human welfare-related expenditure, which is more equitably distributed among the population. In this case five countries actually register a rise in economic welfare as a percentage of GDP by (col I - col D) 3% in Italy and UK, 5% in Japan and Spain, 7% in Germany and 14% in Sweden. This illustrates the problem of viewing per capita GDP or even PDI without factoring in both inequality and welfare-related payments by government. When measured by EWI, the USA still remains the most prosperous nation followed by Germany. Surprisingly we find that while China's per capita GDP is 66% higher than India's, its EWI is only 5% more. This results from the fact that India's personal disposable income represents 82% of GDP whereas China's is only 51%. At the upper end, USA's GDP is 28% higher than second ranked UK, but its EWI is only 17% higher than UK and 16% higher than second ranked Germany.

*Table 2: Values for GDP per capita (GDP), personal disposable income per capita (PDI) and Economic Welfare Index per capita (EWI) in 2005 international dollars PPP, Gini, Gini adjusted constant ( $G_{ec}$ ). All values are for the year 2005*

A	B	C	D	E	F	G	H	I	J	K	L
Country	GDP	PDI	PDI as % of GDP	Gini	$G_{ec}$	PDI- $G_{ec}$ as % of GDP	EWI	EWI as % of GDP	Rank by GDP	Rank by PDI	Rank by EWI
India	2,234	1,821	82%	0.37	0.14	70%	1,638	73%	16	16	16
China	4076	2,019	50%	0.42	0.17	41%	1,827	45%	15	15	15
Brazil	8,505	5,459	64%	0.56	0.27	47%	4,420	52%	13	14	14
S. Africa	8504	5,782	68%	0.65	0.32	46%	4,690	55%	14	13	13
Turkey	10,977	8,291	76%	0.43	0.18	62%	7,112	65%	12	12	12
Mexico	12,563	9,492	76%	0.47	0.21	60%	8,060	64%	10	10	11
Croatia	14,271	8,667	61%	0.29	0.09	55%	9,720	68%	9	11	10
Russia	11,861	10,564	89%	0.38	0.14	76%	10,297	87%	11	9	9
Korea,Rep	22,783	11,875	52%	0.31	0.10	47%	11,764	52%	8	8	8
Italy	28,144	19,205	68%	0.35	0.13	60%	20,082	71%	6	4	5
Japan	30,310	16,571	55%	0.32	0.11	49%	18,186	60%	5	6	7
Spain	27,377	18,569	68%	0.32	0.11	61%	20,057	73%	7	5	6
Germany	31,378	21,449	68%	0.3	0.10	62%	23,700	76%	4	3	2
Sweden	32,319	16,183	50%	0.23	0.05	47%	20,592	64%	3	7	4
UK	32,690	22,364	68%	0.35	0.12	60%	23,488	72%	2	2	3
US	41,833	29,516	71%	0.38	0.15	60%	27,483	66%	1	1	1

### 10.3 Employment

In a market economy where employment is the principal means by which people acquire access to the income needed for goods, services and economic security, unemployment is the severest form of deprivation, akin to political disenfranchisement in a democracy. Policy-makers certainly recognize the potential political power of the unemployed, provided this disparate group could ever get organized. Government officials recognize the linkage between rising levels of unemployment and other social ills such as crime, violence, drug

use and social unrest. Wray observes that the direct social costs of unemployment in the USA are equal or greater in value to the financial cost of guaranteeing them employment.<sup>71</sup> Unemployment and underemployment also represent severe forms of wastefulness, waste of human resources. Like other perishable goods, unutilized human capacities tend to degenerate over time, both from want of usage and because of the increasing social alienation and loss of self-esteem associated with unemployment. The remarkable decision of the Government of India to guarantee a minimum of 100 days per year of employment to the 45 million poorest households is testament to the growing recognition of the essential role of employment in human welfare.

Yet in spite of these facts, the plight of the unemployed is largely ignored by traditional income measures of human welfare and by many broader indices of social progress. Eurostat includes six individual measures of employment and unemployment in the list of Sustainable Development Indicators which it monitors. But of the composite indices discussed in Section 6, only WISP incorporates a direct measure of unemployment. The Calvert-Henderson Quality of Life indicators include 10 different measures of employment and unemployment, but it relies on data that is available in the USA and only a few other countries.

One obvious reason for the omission of unemployment in aggregate measures of human welfare is the difficulty that arises in assigning a market value to unemployment. Reliable measures of unemployment are themselves difficult to obtain. Even in OECD countries, the official figures mask the fact that large numbers of people have dropped out of the job market in discouragement and resignation. When underemployment is taken into account, actual levels may be considerably higher than official figures.<sup>72</sup> A study in Australia in 2003 found that 25% of part-time workers sought an average of 37.5% longer working hours.<sup>73</sup> These studies cannot detect what ILO terms 'invisible underemployment', which refers to situations where workers were not fully using their skills in their current employment (because the job itself is low-skill and/or the worker is idle part of the time). In most developing countries where the informal sector predominates, official figures are even less reliable. In India, for example, the informal sector accounts for about 90% of total employment. Government is simply unable to monitor what is happening to huge numbers of new entrants to the workforce, although rising wage levels and increasing shortages of labor suggest that job growth equals or may even exceed growth of the labour force. To illustrate the magnitude of the problem, while ILO figures report an average unemployment rate in India of 2% during the period 2000, an Indian government expert task force concluded the actual figure was 7.3%.<sup>74</sup> For the purposes of this study, ILO data has been used for all countries.

It may be argued that the impact of unemployment on human welfare is already reflected in per capita GDP and measures of inequality, making inclusion of a separate index redundant. However, a recent ILO study confirms that this is not the case. "No clear link emerges between overall changes in employment and inequality. Some countries have created many jobs and at

<sup>71</sup> Wray, Randall, "Full Employment Through Direct Job Creation", Webcast presentation to the World Academy of Art & Science, November 10, 2009. Accessed June 30, 2010, <http://www.worldacademy.org/files/Job%20Guarantee%20Wray%20presentation%20on%20Nov%2010%202009.pdf>.

<sup>72</sup> ILO maintains a database of estimated underemployment in many countries, results ranged from a low of 1.1% of total employment time in USA to 13.9% in Argentina. Studies of specific groups and locales cannot accurately assess the larger problem. Even this data is not available for many countries.

<sup>73</sup> Mitchell, William and L. Randall Wray, "Full Employment through Job Guarantee: A Response to Critics", *CFEPS Working Paper 39*, Center for Full Employment & Equity, University of Newcastle, Australia, Jan 2005, 9. Accessed July 29, 2010, <http://e1.newcastle.edu.au/coffee/pubs/wp/2004/04-13.pdf>.

<sup>74</sup> Planning Commission, "Special Group on Targeting Ten Million Employment Opportunities per Year", Government of India, 2002, 134.

the same time income inequality increased significantly. Other good employment performers saw stable or even declining income inequality... to some extent, this reflects the diverse nature of the jobs created.”<sup>75</sup> Over the past two decades, relatively robust growth in employment has been accompanied by rising levels of inequality. The ILO report attributes this finding to changes in the structure of employment, including an increase in part-time, temporary and informal employment. Furthermore, in recent years there is a growing prevalence of jobless growth, a condition in which GDP rises but unemployment remains high. For these reasons, we argue that separate indices of employment and unemployment need to be incorporated in a composite index of economic welfare.

The task of accounting for the economic impact of unemployment is complicated by the fact that there are different types of unemployment and not all types have equal impact on economic welfare. Workers aged 15 to 24 represent about a quarter of the world’s labour force, ranging from 8 to 16% in Europe and North America to 18% in China, 23% in India and 28 to 30% in most parts of Africa. Youth employment is of crucial importance since it reflects on the capacity of the society to generate sufficient job opportunities for the next generation and to prepare them adequately to avail of the opportunities. In marked contrast to previous recessions, rising levels of long term unemployment is a striking characteristic of the current economic downturn in the USA and other OECD countries. In the USA, 46% of the unemployed have been out of work for more than six months and their jobs are unlikely to come back.<sup>76</sup> Measures of long term unemployment, as well as the average length of unemployment in that group, provide valuable information regarding economic welfare and security.

The problem of long term unemployment is compounded by high levels of unemployment among those 55 years of age or older, as a result of age discrimination when jobs are scarce, increasing obsolescence of skills as a by-product of rapid technological advancement, and the economic dislocation experienced by transition economies. Today 2.2 million American workers over 55 are unemployed, half of them long term, and the poverty rate among this group has risen significantly.<sup>77</sup> Increasing life expectancy magnifies the problem of those above 65 years of age who are compelled to retire but do not have adequate savings or pensions to ensure economic security during an extended period of retirement, as well among those who are still healthy and eager for gainful employment.

In addition to differences in levels of unemployment, countries also vary enormously in the overall employment-to-working-age-population-ratio (EPR). EPR is an important index of the utilization of human resources. From 1970 to 1990 the employment-to-population ratio (EPR) for those 65 years and above fell dramatically in OECD countries but it has since begun to rise again in many countries, with the exception of Europe. In an effort to raise 20 million people out of poverty, the European Union has committed to raising EPR for the age group 20-64 by 6% by 2020. Low EPR in OECD countries usually reflects a low level of participation by women in the workforce as the result of cultural tradition and gender discrimination. Low EPR for 15-64 age group can also results from high levels of tertiary education. EPR for many developing countries is higher than OECD rates, usually because of the large percentage of the workforce engaged in agricultural operations. Therefore measures of EPR for the age group 25+ may be considered more reliable. ILO is the only source of

---

<sup>75</sup> International Labour Organization, *op. cit.*, p.115.

<sup>76</sup> Semuals, Alana, “For Many Unemployed Workers, Jobs Aren’t Coming Back”, *Los Angeles Times*, Sept. 5, 2010. Accessed August 4, 2010, <http://articles.latimes.com/2010/sep/05/business/la-fi-america-unemployment-mainbar-2010090>.

<sup>77</sup> Rich, Motoko, “For the Unemployed Over 50, Fears of Never Working Again”, *New York Times*, Sept. 19, 2010.

EPR data for all countries and they use an open ended measure for population aged 15+ and 25+. One advantage is that it does not place an arbitrary limit on retirement age. Data for both employment and unemployment rates for most developing countries are based on rough estimates or sample surveys, which are inherently unreliable. Note that these problems are not confined to developing countries. They are universal. This month the Government of Japan reported that more than 230,000 Japanese centenarians listed on government records cannot be located. Many are believed to be dead, some for decades.<sup>78</sup> Significant changes over time in the reported employment and unemployment rates may be a more reliable index than the absolute numbers.

An adequate index of employment should also reflect the capacity of the economy to create new jobs. Net employment generation tells us whether the economy is creating more job opportunities and whether or not their number is sufficient to compensate for the increasing number of new entrants to the workforce. Two countries with the same unemployment rates may differ significantly in their capacity for job creation. For example, Argentina and Germany both reported unemployment rates of 11% in 2005, but the total number of new jobs in Argentina grew by 4.3% over the previous year compared with only 0.3% in Germany.

The present economic theory accords greater importance to production and efficiency than it does to the value of human beings and ignore employment. Is this value system essential or inevitable? Granted that there are real obstacles to effective measurement, efforts to take into account this crucial aspect of economic welfare are essential for the development of more reliable measures. Unemployment is both an economic and a social problem. Gender or racial discrimination in employment, rising rates of crime and violence, loss of self-esteem and alienation arising from absence of social status and identity are important social aspects of the issue. Obviously, there is a need to develop a new economic theory! Here we attempt to develop an index that focuses more narrowly on the impact of employment on the economic welfare of the population.

### *10.3.1 Full Employment Index*

The interaction between employment, education, disposable income, government welfare-related expenditure and income inequality is complex and multi-directional. We know that rising levels of unemployment reduce disposable income, increase inequality and stimulate transfer payments to some extent. More difficult to measure is the impact of under-employment, which may be many times higher than the actual unemployment rate, and part-time work, which can be the result of either personal preference or lack of opportunities. Changes in demography, social attitudes and living standards also powerfully influence long term employment trends. An index that partially reflects the impact of unemployment on economic welfare can provide useful insights and guidance to policy-makers when viewed as a complement to monitoring of incomes, inequality and education. Taking into account the paucity of reliable data on some dimensions of the issue, we propose a composite index for Full Employment (FEI) which includes four sub-indices.

---

<sup>78</sup> McCurry, Justin, "Japan Launches Nationwide Search for Centenarians", *Guardian*, Aug 3, 2010. Accessed August 13, 2010, <http://www.guardian.co.uk/world/2010/aug/03/japan-centenarians-search>.



- *Employment-Population Index* — EPI is arrived at by taking the Employment-Population ratio for those aged 25+ and converting it into a scale from 0.01 to 1.0, assuming that 66% EPR represents full employment.<sup>79</sup> Note the cutoff level for full employment rises to 80%, if EPR is considered for aged 25-64 only.
- *Adult Employment Index* — AEI measures the rate of employment among members of the labour force aged 25+. The adult unemployment rate is derived by deducting from total employment and unemployment data, those under 25 years of age.<sup>80</sup> Adult underemployment is estimated by taking twice the level of adult unemployment. Our justification for doubling the unemployment rate is to take into account hidden underemployment and unemployment of discouraged workers who have dropped out of the labour market. Thus,  $AEI = 1 - 2(AUR)$ .
- *Youth Employment Index* — YEI measures the rate of employment among members of the labour force aged 15-24. It is derived by taking 1 minus the youth unemployment rate (YUR). In recognition of the great importance of providing employment opportunities to the young generation, we have assigned a weight to YEI equal to that of AEI, even in cases where the actual proportion of youth in the work force is far less than 50%.  $YEI = 1 - YUR$ .
- *Job Creation Index* — JCI measures the net rate of change in total employment year-to-year. JCR measures the net change in the total number of jobs from year to year, which serves as the basis for the index JCI.  $JCI = (1 + JCR) = JCI = 1 + \frac{TE_2 - TE_1}{TE_1}$ , where TE1 & TE2 are total employment in the previous and subsequent year. A value less than one for JCI signifies a decline in total employment from the previous year. A value of more than one signifies an increase in employment. Thus, a grow rate of employment of 10% would be indicated by a value of 1.10.
- *Full Employment Index* — FEI is equal to the average of the four sub-indices as shown below.

$$FEI = \frac{(EPI + AEI + YEI + JCI)}{4}$$

----- (4)

Table 3 presents several key indices of employment which are periodically monitored by almost all countries. The table is divided into two halves. The left side contains data for total unemployment rate (TUR), youth unemployment rate (YUR), employment to population ratio age 25+ (EPR), and net job creation rate (JCR) given as percentages. The right side contains

<sup>79</sup> The adoption of a 66% cut-off ratio is based on the assumption that not everyone needs to or wants to work, even if attractive opportunities for gainful employment are available. Some may prefer to stay at home with family, volunteer or pursue interests which do not lend themselves to monetary reward. What constitutes real full employment may vary over time and between countries and cultures. Until more adequate measures are available, a somewhat arbitrary cutoff is necessary to avoid exaggerating the value of this indicator. In 2005, Korea registered the highest EPR among OECD countries in our sample. Most OECD countries recorded a downward trend, e.g. Sweden's EPR 25+ declined from 68% in 1990 to 59% in 2005. Japan's fell from 67% to 58%. According to ILO 70 developing countries have an EPR of 66% or higher. Since in most of these cases very high EPR reflects a high level of casual, informal or seasonal labour, EPR may not be a useful measure for monitoring progress in these countries. Therefore, we have adopted the lower norm of OECD countries as more representative of full utilization of human capital.

<sup>80</sup> The ILO data does not have an upper age cut-off limit, so it includes all those who continue to work or seek employment upto and beyond the age of 65.

the derived indices for youth employment (YEI), adult employment (AEI), employment to population (EPI), job creation (JCI) and the composite Full Employment Index (FEI), which is the average of the four sub-indices. Note that a high FEI does not mean there is no further scope for improving the quality or number of employment opportunities. It only signifies that unemployment as measured by these parameters has relatively low impact on consumption expenditure and income inequality.<sup>81</sup>

Country FEI scores range from a high of 96% in Mexico, India and China to a low of 69% in South Africa. We realize that data for these calculations from developing countries is notably unreliable, but OECD countries are not exempt from reliability problems. To some extent the tendency to underestimate the magnitude of unemployment is offset by the fact that higher unemployment will also express as lower levels of PDI and higher levels of inequality, both of which result in lower overall rankings on the composite index, which includes EWI and employment. Between 2005 and 2009, the FEI for USA fell from 94% to 91%, as a result of a doubling of total unemployment in the country. This figure underestimates the total impact of the current economic downturn, but here too the impact would also be reflected in a lower EWI. The very low FEI of 69% for South Africa results from a high total unemployment rate of 27% combined with an even higher unemployment rate of 54% among youth, who constitute 33% of the labour force.

*Table 3: Employment sub-indices and FEI for selected countries for the year 2005*

A	B	C	D	E	F	G	H	I	J	K
Countries	TUR	YUR	AUR	EPR	JCR	YEI	AEI	EPI	JCI	FEI
Mexico	0.04	0.07	0.05	0.63	1.83	0.93	0.95	0.94	1.02	0.96
China	0.04	0.12	0.05	0.76	1.05	0.88	0.95	1.00	1.01	0.96
India	0.03	0.09	0.02	0.62	2.12	0.91	0.98	0.93	1.02	0.96
Korea	0.04	0.10	0.02	0.64	0.86	0.90	0.94	0.97	1.01	0.95
US	0.05	0.11	0.08	0.62	1.73	0.89	0.92	0.92	1.02	0.94
Japan	0.04	0.09	0.08	0.58	0.50	0.91	0.92	0.86	1.01	0.93
Brazil	0.09	0.19	0.12	0.66	1.64	0.81	0.88	0.99	1.02	0.92
Russia	0.07	0.16	0.12	0.61	1.49	0.84	0.88	0.92	1.01	0.92
UK	0.05	0.13	0.07	0.56	0.86	0.87	0.93	0.85	1.01	0.91
Indonesia	0.11	0.32	0.11	0.68	0.50	0.68	0.89	1.00	1.01	0.89
Sweden	0.08	0.23	0.12	0.59	1.68	0.77	0.88	0.89	1.02	0.89
Argentina	0.11	0.24	0.15	0.60	4.34	0.76	0.85	0.89	1.04	0.88
Spain	0.09	0.20	0.15	0.51	5.25	0.80	0.85	0.76	1.05	0.86
Algeria	0.15	0.31	0.21	0.55	9.26	0.69	0.79	0.83	1.09	0.85
Germany	0.11	0.15	0.21	0.51	0.35	0.85	0.79	0.76	1.00	0.85
Egypt	0.11	0.34	0.08	0.52	2.42	0.66	0.92	0.78	1.02	0.84
Turkey	0.10	0.19	0.16	0.47	1.29	0.81	0.84	0.71	1.01	0.84
Italy	0.08	0.24	0.12	0.45	0.20	0.76	0.88	0.67	1.00	0.83
Croatia	0.13	0.32	0.20	0.48	0.77	0.68	0.80	0.72	1.01	0.80
S Africa	0.27	0.54	0.44	0.49	0.86	0.46	0.56	0.74	1.01	0.69

<sup>81</sup> Ravi, Ranjani. "Measuring Full Employment", *MSS Research Working Paper*, The Mother's Service Society, September 2010. Accessed July 28, 2010, [http://mssresearch.org/?q=Measuring\\_Full\\_Employment](http://mssresearch.org/?q=Measuring_Full_Employment).

Figure 5: Youth Employment Index 1985-2005

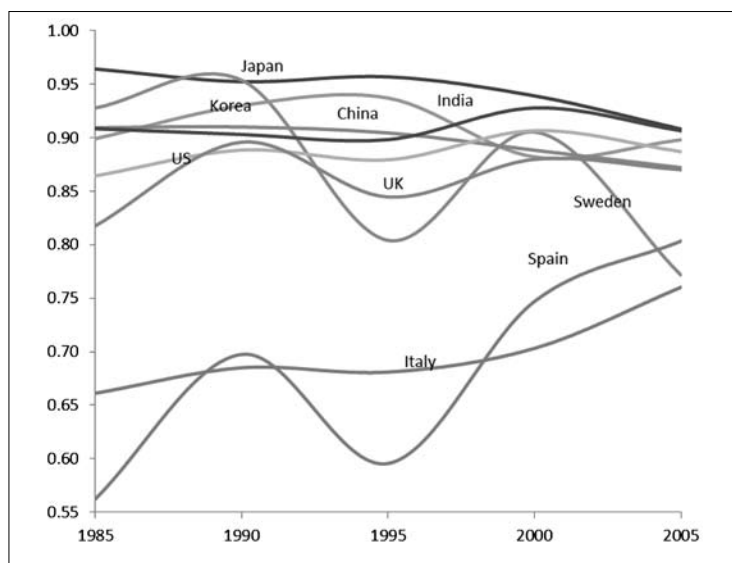


Figure 5 shows 20 year trends in youth unemployment for select countries as measured by YEI (1.00 = full employment). We find the sharpest drop in YEI for Sweden from 0.93 to 0.77. The oscillation in YEI for Sweden and Spain require further analysis. YEI is relatively constant over time in Korea and India, in spite of a huge surge in the under 25 population, and rising most dramatically in Spain from 0.56 to 0.80 and Italy from 0.66 to 0.76

Table 4 shows historical trends on FEI from 1985 to 2005 for select countries. This table will be referred to for the historical analysis of HEWI in Section 10 of this paper.

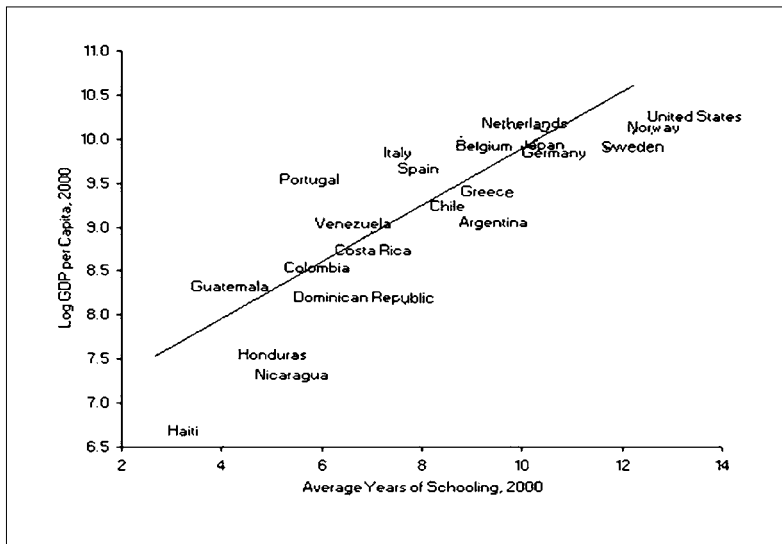
Table 4: Historical trends on FEI from 1985 to 2005 for select countries

FULL EMPLOYMENT INDEX (FEI)						
Countries	1985	1990	1995	2000	2005	FEI AVERAGE
India	0.97	0.97	0.96	0.97	0.96	0.97
Korea, Rep	0.95	0.98	0.99	0.95	0.95	0.96
China	0.97	0.96	0.96	0.95	0.96	0.96
Japan	0.98	0.98	0.96	0.93	0.93	0.96
US	0.92	0.94	0.93	0.95	0.93	0.94
Sweden	0.97	0.98	0.87	0.92	0.89	0.93
UK	0.86	0.91	0.87	0.91	0.91	0.89
Italy	0.82	0.82	0.78	0.80	0.83	0.81
Spain	0.72	0.79	0.70	0.81	0.86	0.78

## 10.4 Education

Education is rightly regarded as an essential component of overall human development and well-being. Our objective here is confined to measurement of human economic welfare, rather than human development per se. Here too, education needs to be included, since the relationship between education and incomes is well documented. Cross country studies indicate that an extra year of school is associated with a 30% increase in per capita income as shown in Figure 6.<sup>82</sup> Throughout the world, higher levels of education are also associated with higher levels of employment and higher income. An extra year of schooling increases earnings from 6 to 14%.<sup>83</sup> Other studies reveal a very high correlation between education and per capita GDP in both developed and developing countries, as measured by UNDP's composite education index.<sup>84</sup>

Figure 6: Years of Schooling & Country GDP



Rising levels of education are also associated with lower levels of unemployment. In the USA those with a high school diploma earn 42% more and had an unemployment rate 36% lower than those without a high school diploma.<sup>85</sup> In the Czech Republic, unemployment

<sup>82</sup> Glaeser, "E.G. Education Last Century, and Economic Growth Today", *The New York Times*, October 2009. Accessed September 1, 2010, <http://economix.blogs.nytimes.com/2009/10/20/education-last-century-and-economic-growth-today>.

<sup>83</sup> Card, D., "The Causal Effect of Education on Earnings", Chapter 30. In *Handbook of Labor Economics*, Volume 3, Ashenfelter, Card, D. pp. 1801-1859. Accessed September 1, 2010, [http://emlab.berkeley.edu/users/card/papers/causal\\_educ\\_earnings.pdf](http://emlab.berkeley.edu/users/card/papers/causal_educ_earnings.pdf).

<sup>84</sup> "Overcoming Barriers: Human Mobility and Development", *Human Development Report 2009*, UNDP. Accessed September 1, 2010, [http://hdr.undp.org/en/media/HDR\\_2009\\_Tables\\_rev.xls](http://hdr.undp.org/en/media/HDR_2009_Tables_rev.xls).

<sup>85</sup> "Education Pays", Bureau of Labor Statistics, United States Department of Labor. Accessed September 4, 2010, <http://www.bls.gov/emp/emptab7.htm>. (Data is based on weekly median earnings of full-time wage and salary workers in 2006.)

among university graduates is only 2% compared with 23% for those who did not finish secondary school.<sup>86</sup> University graduates in Norway and Hungary earn 26% and 117% more respectively than those who only finish secondary school.<sup>87</sup>

All of the individual and composite measures referred to above incorporate indices for education, though the rationale and approach varies. HDI allocates one-third of its total weightage to measures of literacy and school enrollment, in the proportion literacy (2/3) and primary-secondary-tertiary school enrollment (1/3). The heavy weightage assigned to basic literacy in HDI appears disproportionate, especially considering the way literacy is defined and measured in many developing countries. GPI assigns a dollar value to each year of higher education. ISEW includes 50% of all public and private expenditure on higher education in its calculation of total consumption expenditure. While this may be suitable for an index applied solely to OECD countries, for global application and cross-country comparisons, the exclusive focus on higher education seems somewhat arbitrary, since many developing countries have yet to achieve universal enrollment at lower levels.<sup>88</sup>

While educational enrollment rates have risen dramatically over the past five decades, there is still a significant proportion of the world's population that lacks this most fundamental asset for improving their economic welfare. Still more than 100 countries have not yet achieved 90% net enrollment rates for primary education and of these 44% are still below 80%. In Sub-Saharan Africa the average is under 70%. Only 12 countries in the world have achieved net secondary education enrollment rates of 90% or higher. Tertiary enrollment among those in the five year age group beyond secondary school ranges from less than 1% to a high of 92% in Korea. Only 24 countries have rates of 50% or higher, 86 countries have rates of less than 25%, and 53, rates of less than 10%.<sup>89</sup>

Enrollment rates are at best a very crude measure of educational attainment, often concealing as much as they reveal of true progress toward universal education. Recent surveys report that the average reading ability of Indonesian school students is equivalent to that of the lowest 7% of French students, the average math ability of Brazilian school students is equal to the abilities of the bottom 2% of Danish students, 31% of Indian students who completed the lower primary cycle could not read a simple story and 29% could not do two-digit math problems. In Ghana, only 25% of 15-19 year olds score more than 50% on a test of one and two digit math questions. Despite the country's top rank in terms of total spending on education, U.S. students scored lower on science literacy than their peers in 16 of the other 29 OECD jurisdictions and 6 of the 27 non- OECD jurisdictions.<sup>90</sup>

While any attempt to assign economic value to education must be subjective, abstract numerical scales such as HDI and cost-based measures such as GPI fail to take into account the direct contribution of education to economic performance and living standards. In constructing an index of economic welfare, we focus instead on the role of education as an

---

<sup>86</sup> "Unemployment Rates and Educational Attainment (2004)", Table A8.2b, Education at a Glance, OECD, 2006. Accessed September 6, 2010, <http://statlinks.oecdcode.org/962006061P1-A8.XLS>.

<sup>87</sup> "The Returns to Education: Education and Earnings (2004)", Table A9, Education at a glance, OECD, 2006. Accessed September 9, 2010, <http://statlinks.oecdcode.org/962006061P1-A9.XLS>.

<sup>88</sup> National Center for Educational Statistics, "PISA 2006: Performance of U.S. 15-Year-Old Students in Science and Mathematics Literacy in an International Context", 2007, p. Accessed September 13, 2010, <http://nces.ed.gov/pubs2008/2008016.pdf>.<http://nces.ed.gov/pubs2008/2008016.pdf>.

<sup>89</sup> UNESCO, Primary and Secondary Net Enrollment Data Tables. Accessed August 29, 2010, <http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx?ReportId=174>.

<sup>90</sup> Filmer, D., A. Hasan., and L. Pritchett, "A Millennium Learning Goal: Measuring Real Progress in Education", *Center for Global Development Working Paper 97*, 2006, 5-6.

investment in future economic performance. Rather than trying to assign arbitrary value to each year of education, we consider current economic performance as a result and reflection of the past educational attainments of the workforce. A rise in the average levels of education today represents an investment that will reflect in higher economic performance in the future. Since the essential purpose of an indicator is to promote effective policy-making and action, an indicator that factors in rising levels of investment in education assigns value to actions today that will contribute to future economic welfare.

#### 10.4.1 Combined Education Index

The Combined Education Index (CEI) assesses the changes in school enrollment rates for primary, secondary and higher education over time as a measure of changes in the future capacity of society to generate human welfare. Regarding economic performance as a function of education, we adjust current level of economic welfare by an index that reflects the change in the enrollment rate at primary, secondary and tertiary levels over a period of time. Data on enrollment levels is notably unreliable in many countries compounded by over and under age students and home schooling. Even countries with advanced statistical systems such as USA are subject to major inaccuracies in the data.<sup>91</sup> Calculations are based on the gross enrollment rates for primary (PER), secondary (SER) and tertiary (TER) as normalized by UNDP for the combined enrollment rates (CGER) used in the Human Development Index.<sup>92,93</sup> In consideration of the increasing importance of higher education in economic development and welfare, the index assigns double weightage to changes in tertiary rates. We designate this modified CGER as CER<sub>H</sub>.<sup>94</sup>

$$\begin{aligned} CER_H &= \frac{3CGER + TER}{4} \\ CER_H &= 0.33 PER + 0.23 SER + 0.44 TER \end{aligned}$$

----- (5)

In recognition of the time lag between acquisition of education and its impact on economic activity, we define the Combined Education Index (CEI) through CER<sub>Δn</sub>.

$$CEI_n = 1 + [1.0 * CER_{\Delta(n-5)} + 0.9 * CER_{\Delta(n-6)} + 0.81 * CER_{\Delta(n-7)} + \dots 0.14 * CER_{\Delta(n-25)}]$$

----- (6)

Where

$$CER_{\Delta n} = CER_{Hn} - CER_{H(n-1)}$$

----- (6a)

<sup>91</sup> Greene, Jay P. "High School Graduation Rates in the United States", Civic Report of the Manhattan Institute for Policy Research, Nov 2001. Accessed July 29, 2010, [http://www.manhattan-institute.org/html/cr\\_baoe.htm](http://www.manhattan-institute.org/html/cr_baoe.htm).

<sup>92</sup> UNDP, Combined Gross Enrollment rates Data Tables for HDI Education Index. Accessed August 4, 2010, <http://hdrstats.undp.org/en/indicators/90.html>.

<sup>93</sup> "Remeasuring the HDI by Data Envelopment Method", Interim Report of the International Institute of Applied System Analysis, Austria, 2001.8. Accessed on September 5, 2010, <http://www.iiasa.ac.at/Admin/PUB/Documents/IR-01-069.pdf>.

<sup>94</sup> UNDP's CGER apportions the following weightage in their CGER = (Gross Enrollment Ratio primary education \* 7/17) + (Gross Enrollment Ratio secondary education \* 5/17) + Gross Enrollment Ratio tertiary education \* 5/17. For CEI, we increase the weightage of tertiary by an additional 21%.

$CER_{\Delta n}$  measures the absolute change in combined enrollment levels over time (equation 6a). CEI measures the cumulative impact of that change on human economic welfare at any point during 25 years in time subsequent to the change in  $CER_H$ . As the more educated youth enter the workforce and the impact of rising levels of education gradually impacts on actual GDP and HWE, the factor multiplying  $CER_{\Delta n}$ , i.e. 1, 0.9, 0.81 etc. for past educational achievements declines proportionately, because over time the impact of earlier education enrollment comes to be reflected in GDP and in our HWE. As an example, CEI (2005) for Sweden for year 2005 is given by:

$$CEI(2005) = 1 + [ CER_{\Delta 2000} + 0.9 * CER_{\Delta 1999} + 0.81 * CER_{\Delta 1998} + ... 0.14 * CER_{\Delta 1980} ]$$

*Table 5: CEI of selected countries 2005*

Country	CEI 2005
Sweden	1.16
Korea, Rep	1.16
Germany	1.11
UK	1.10
Spain	1.09
Egypt	1.09
Italy	1.08
Turkey	1.08
Argentina	1.07
China	1.06
South Africa	1.06
Japan	1.05
Algeria	1.05
Mexico	1.04
Croatia	1.03
India	1.02
Russia	1.02
Indonesia	1.02
US	1.01

Table 5 shows the CEI of selected countries for 2005. Korea achieved a CEI of 1.16 as a result of a 67% rise in CER from 1975-1995, including a 478% rise in tertiary enrollment from 9% in 1975 to 52% in 1995. Its CER rose by 28% from 1995 to 2005. Sweden also recorded a CEI2005 of 1.16 as a result of a 44% rise in CER for 1980-2005. The CEI2005 for UK was 1.10, primarily as the result of a 165% rise in tertiary enrollment during the 1975-1995 period from 19% to 50%. UK's TER rose by another 20% between 1995 and 2005, but the impact will reflect in CEI values only from 2006 onwards. Other countries still have enormous scope for raising CER at primary and secondary level. India's net secondary enrollment rate is 90%. Another 91 countries have net SER lower than India. It is noteworthy that of the countries studied, the five which recorded the highest growth rates in CEI were all OECD countries that had already attained high absolute levels of enrollment, signifying the scope for further progress on CEI even at the top of the scale. As a reflection of this potential, high school drop-out rates in US have declined by a third

since 1995.<sup>95</sup> Tertiary enrollment in USA (82%) now lags behind Korea (92%); Japan (55%) and Italy (64%) still have considerable scope for progress. The high quality of education is shown by several other indicators, e.g. the ranking of the best universities and through indicators assessing research and development productivity. According to these scores the USA, the UK, Japan and Germany are at the very top. Nevertheless, none of such indicators are useful for assessing economic progress toward achieving welfare and human well-being and therefore, they have not been included.

*Table 6: Changes in CEI from 1985 to 2005 for select countries*

Country	CER <sub>H</sub>						CER <sub>H25</sub> 1980-2005	CEI				
	1980	1985	1990	1995	2000	2005		1985	1990	1995	2000	2005
China	44	40	41	49	52	56	1.3	1.08	1.01	1.02	1.06	1.06
India	32	38	39	43	42	48	1.5	1.03	1.06	1.05	1.06	1.02
Italy	58	55	61	69	73	84	1.5	1.04	1.00	1.05	1.09	1.08
Japan	67	66	65	71	74	78	1.2	1.08	1.04	1.01	1.05	1.05
Korea, Rep	56	66	69	75	88	96	1.7	1.12	1.15	1.11	1.11	1.16
Spain	63	68	72	81	84	88	1.4	1.09	1.10	1.09	1.12	1.09
Sweden	64	63	64	85	92	92	1.4	1.05	1.03	1.02	1.18	1.16
UK	58	57	65	73	78	84	1.4	1.04	1.02	1.07	1.10	1.10
US	75	79	86	88	86	90	1.2	1.06	1.07	1.09	1.07	1.01

Table 6 presents changes in CEI from 1985 to 2005 for select countries. The left hand columns provide the actual CER<sub>H</sub> enrollment figures for 1980 to 2005 and the total change over 25 years (CER<sub>H25</sub>). The center column measures the overall 25 year index for CER<sub>H25</sub> from 1980-2005 (e.g. a value of 1.50 indicates 50% rise in CER<sub>H</sub> over 25 years, equivalent to 2% a year). The right hand section shows the average rate of enrollment growth as measured by CER from 1980 and 2005. Korea recorded the highest 25 year average (1.70) followed by Sweden (1.40). The USA and Japan recorded the lowest level of improvement over time (1.20), although its absolute levels of enrollment in 2005 rank only second to Korea.

CEI does not address the very important issue of quality of education, which varies very widely both within and between countries. Since 2000, PISA, Programme for International Student Assessment, has been measuring performance of 15 year olds on reading, mathematics and science literacy. Currently 30 OECD and 27 non-OECD countries are participating. China and India are not included. Future versions of CEI may be modified to incorporate the qualitative dimension of education based on PISA. Our approach does not diminish the inherent value of education as an endowment in its own right or its wider contribution to social development, human welfare and well-being. Our purpose here is only to recognize its role as an investment in future economic welfare.

### *10.5 Environment*

The startling findings presented in the Club of Rome's report *Limits to Growth* alerted the world to the imminent danger inherent in the economic model prevalent at the time. Since then many things have changed, but the fundamental premise remains valid. Here, too, a

<sup>95</sup> National Center for Educational Statistics, US Dept of Education, Accessed August 15, 2010, <http://nces.ed.gov/fastfacts/display.asp?id=65>.



new theoretical framework is needed which recognizes environmental sustainability as an essential component of sustainable human welfare and identifies the principles by which these apparently disparate objectives can be most effectively reconciled. It is not sufficient to say that we cannot sustain current levels of resource consumption or call for a halt in economic growth. We must also take into account the changing composition of economic activity from products to services, the impact of technological advances that develop new energy sources and increase energy efficiency, the impact of education and culture on resource consumption, the rising aspirations of the developing world, and factors influencing changes in life style, as well as the political and social sustainability. New theory means new thought, new conception. Our view of the relationship between human activity and our natural environment must change radically.

M. Max-Neff pointed out that over time more and more economic activity is self-canceling from a welfare perspective. For every society there seems to be a period in which economic growth brings an improvement in the quality of life, but only up to the point — the threshold — beyond which, if there is more economic growth, quality of life may begin to deteriorate.<sup>96</sup> The abrupt differences between GDP and several other indicators, e.g. energy consumption, quality of life, and happiness, etc., are similar manifestations of the Max-Neff effect.<sup>97</sup> Historical analyses may show that GDP was a very good indicator to achieve political and economic objectives earlier in the last century; but today it leads to wrong conclusions and bad decisions resulting in destruction of the environment, missed opportunities and misuse of human capital. Nevertheless, many argue that GDP is correlated with several important socioeconomic indicators, e.g. there is a linear correlation between GDP/capita and personal well-being of EU member states.<sup>98</sup> Correlations do not and cannot prove that any indicator is reliable and that policies and decisions based on that indicator are not wrong. Rankings by GPI and ISEW as well as International Index of Social Progress (IISP) drastically differ from GDP, e.g. the USA is ranked 27th according to IISP.<sup>99</sup>

Many attempts have been made to incorporate measures of sustainability in composite indices. GPI and ISEW discount consumption for the depletion of or damage to environmental resources by deducting estimated costs associated with water, air and noise pollution as well as those resulting from the loss of wetlands, farmland, primary forests, CO<sub>2</sub> damage and ozone depletion. Natural resources depletion is valued by measuring the investment necessary to generate a perpetual equivalent stream of renewable substitutes. Sen and Stiglitz observed that these and similar measures such as Green GDP do not characterize ecological sustainability per se or assess how far we are from achieving sustainability targets.<sup>100</sup> Another composite index, the Ecological Footprint (EF), attempts to measure the impact of human activities on the regenerative capacity of the biosphere by calculating the amount of biologically productive land and water area required to support a given population at its current level of consumption and resources. EF couches the results in units of land rather than market prices. These approaches offer valuable insight into the true costs and sustainability of current economic activity. At the same time they introduce elements of complexity and subjective valuation which prevent their widespread acceptance and adoption as the basis for policy-making. They also depend on access to reliable data which is not available for most countries.

<sup>96</sup> Max-Neff, M. A. "Economic Growth and Quality of Life: A Threshold Hypothesis", *Ecological Economics*, 15(1995): 115-118.

<sup>97</sup> "In Pursuit of Happiness Research. Is it Reliable? What Does it Imply for Policy?", The Cato institute, April 2007 for Vergata Conference on Subjective Well-Being.

<sup>98</sup> M. Degutis *et al.* "Relation Between GDP and life Satisfaction in the EU", *Ekonomika*, 89 (2010): 9- 21. C. Bjørnskov *et al.* "Analysing Trends In Subjective Well-Being In 15 European Countries", *Journal Of Happiness Studies*, 9 (2008): 317-330. Bruno S. Frey, And A. Stutzer. "Happiness And Economics", Princeton Univ. Press, 2001.

<sup>99</sup> IISP Report 2003. "International Index of Social Progress", 5th International Conference of the International Society for Life Quality Studies, 15-17 November 1998, Baltimore, Maryland, USA.

<sup>100</sup> Stiglitz *et al.*, *op. cit.*, p. 66-67.

There is certainly a need for indices that assign value to natural resources and the costs associated with pollution, as well as the inherent risks and uncertainties of current economic models. While recognizing the value of these comprehensive efforts to sustainable economic activity, the authors propose a more modest and limited approach to factoring environment concerns into a composite index of economic welfare, one which can be adopted worldwide based on available data. For this purpose, we focus on a single dimension of sustainability, fossil energy efficiency. Eurostat includes the ratio between the gross inland consumption of energy (coal, electricity, oil, natural gas and renewable energy sources — available for consumption) and the GDP as an index of energy efficiency. From 1980 to 2007, energy efficiency as measured by GDP per unit of energy consumed in 2005 international dollars has improved substantially, ranging from an increase of 25% in Japan and 27% France to 71% in India and USA, 88% in UK and 200% in China.<sup>101</sup> This indicator reveals a progressive decoupling of energy use from GDP growth as the result of the shift from industry towards services and within industry to less energy-intensive activities; the closure of inefficient, high-polluting units; as well as end-use efficiency gains, such as lower energy-consuming appliances.

The objective here is to measure human economic welfare rather than sound environmental practices or quality of life per se, however important these goals may be. Sustainability of economic activities is an essential aspect of economic welfare. Therefore, it is essential that it be reflected in any measure of economic welfare. The authors propose an Energy Efficiency Index (EEI) designed to promote policy-decisions that will reduce dependence on fossil fuels, while promoting improvements in the overall efficiency of all forms of energy consumption as a contribution to economic sustainability. The index takes into account only energy generated from fossil fuel sources, since fossil fuel based energy consumes non-renewable resources and releases CO<sub>2</sub> into the atmosphere.

Some may argue that the effort to assign value to reduced dependence on fossil fuels is necessarily subjective and arbitrary, and therefore inappropriately included in a composite measure of economic welfare. This points to the underlying insufficiency of the prevailing economic concept of value discussed in Section 4 of this paper. As Orio Giarini has so aptly stressed, economic value in a modern service economy cannot be divorced from risk and uncertainty. No greater risk or uncertainty confronts economy today than the future risks of ecological disaster. We need only reflect on the central purpose and methods of valuation employed by the insurance industry to realize that we assign concrete economic value to risks and uncertainties all the time. That value may be related to the anticipated costs of avoidance or the costs of remediation or some less tangible value of security.

In order to assess efficiency of energy usage for economic welfare rather than for economic growth, EEI is based on the ratio of fossil fuel energy consumption (FFEC) to total human economic consumption expenditure (HWE) — not to GDP. EEI is calculated as the percentage change in the ratio of fossil fuel energy consumption to HWE over time. Like education, investments in energy generation have a long gestation period, which ranges from about one year for wind turbines to 5 years or more for nuclear power, and an even longer period of utilization, which averages 30 years. Thus, each increase in the percentage of fossil fuel energy efficiency represents a long term investment in sustainability with repercussions for many years to come. Since improvements in energy efficiency can also be achieved by short term measures such as use of energy efficient lighting or refrigeration, we estimate the life span of the enhancements as a much shorter period of 10 years, though it is probably much higher.

---

<sup>101</sup> Based on Data Tables from “International Energy Agency”, Accessed August 23, 2010, <http://www.eia.doe.gov>.

The index measures the changes in fossil fuel energy efficiency over time, where  $FFEC_1$  and  $FFEC_0$  represent fossil fuel energy consumption in year one and the previous year, and  $HWE_1$  and  $HWE_0$  represent human welfare consumption expenditure year one and the previous year.

FFER is the ratio of fossil fuel energy consumption to HWE.  $FFER_{\Delta 1}$  is the change in the ratio for year one.  $FFER_{\Delta-1}$  is the change in the ratio the previous year.  $FFER_{\Delta-2}$ , etc. are defined analogously.

$$FFER_{\Delta 1} = \frac{\left\{ \frac{FFEC_1}{HWE_1} \right\} - \left\{ \frac{FFEC_0}{HWE_0} \right\}}{\left\{ \frac{FFEC_0}{HWE_0} \right\}}$$

EI for any year assigns present value ( $V_{FFER}$ ) to changes in FFER during the previous 10 years as represented by  $FFER_{\Delta-1}$ ,  $FFER_{\Delta-2}$  ...  $FFER_{\Delta-10}$ .  $V_{FFER}$  starts with a value of 1 and diminished at the rate of 0.1 per year. Thus,  $V_{FFER-1} = 1$ ,  $V_{FFER-2} = 0.9$ ,  $V_{FFER-3} = 0.8$ , ...  $V_{FFER-11} = 0.0$ .

$$\text{Energy Efficiency Index } EEI_1 = 1 - [(V_{FFER-1} \times FFER_{\Delta-1}) + (V_{FFER-2} \times FFER_{\Delta-2}) + \dots (V_{FFER-10} \times FFER_{\Delta-10})]$$

$$\text{Energy Efficiency Index } EEI_1 = 1 - [(0.1 \times FFER_{\Delta-1}) + (0.2 \times FFER_{\Delta-2}) + \dots (1.0 \times FFER_{\Delta-10})] \quad \text{-----}(7)$$

As EEI increases, the number within brackets becomes more negative in value. EEI increases either as a result of improving overall energy efficiency per unit of HWE or by replacing fossil fuel with renewable energy sources, i.e. either by decreasing FFEC or by increasing HWE.

Table 7 shows the fossil fuel consumption (FFEC) per unit of human consumption expenditure (HWE), FFEC as a % of total energy consumption, and the derived Energy Efficiency Index (EEI) for select countries. FFEC as a % of total energy indicates the extent of dependence on fossil fuel energy sources vs. renewable energy sources, which ranges from a low of 36% in Sweden to a high of 93% in China.<sup>102</sup> FFEC per unit of HWE (in constant 2005 intl dollars) ranges from a low of 4683 btu per dollar in Sweden to a high of 30,386 btu in China, a factor of 6.4. About 60% of this difference is the result of Sweden's lower dependence on fossil fuel energy sources in comparison to China. The remainder of the difference is due to Sweden's higher overall energy efficiency.

EEI measures the change in the FFEC/HWE ratio between 1995 and 2005. Values greater than 1.0 indicate decreasing use of fossil fuels and/or increasing HWE. While China's FFEC rose by 90% during this period due to a huge expansion of manufacturing capacity, HWE rose 104%, resulting in an EEI of 1.04. Russia's FFEC rose only 5% during the same period, while

<sup>102</sup> Historical Data on Fossil fuel consumption values, British Petroleum, Accessed September 4, 2010, [http://www.google.co.in/url?sa=t&source=web&cd=2&ved=0CBsQFjAB&url=http%3A%2F%2Fwww.bp.com%2Fliveassets%2Fbp\\_internet%2Fglobalbp%2Fglobalbp\\_uk\\_english%2Freports\\_and\\_publications%2Fstatistical\\_energy\\_review\\_2008%2FSTAGING%2Flocal\\_assets%2F2010\\_downloads%2FStatistical\\_Review\\_of\\_World\\_Energy\\_2010.xls&ei=gnOQTPabLlu0vgPDuNDmCw&usg=AFQjCNGWz6t-abAZPzj7T3QmZFQbbLek\\_A&sig2=It7VDqABaT8xhuNr\\_VOeg](http://www.google.co.in/url?sa=t&source=web&cd=2&ved=0CBsQFjAB&url=http%3A%2F%2Fwww.bp.com%2Fliveassets%2Fbp_internet%2Fglobalbp%2Fglobalbp_uk_english%2Freports_and_publications%2Fstatistical_energy_review_2008%2FSTAGING%2Flocal_assets%2F2010_downloads%2FStatistical_Review_of_World_Energy_2010.xls&ei=gnOQTPabLlu0vgPDuNDmCw&usg=AFQjCNGWz6t-abAZPzj7T3QmZFQbbLek_A&sig2=It7VDqABaT8xhuNr_VOeg).

its HWE rose by 54%, resulting in an EEI of 1.05. The full benefits of these improvements will only be reflected by 2015. We were unable to include Russia in Table 8, due to the absence of reliable data during the period immediately prior to and subsequent to the breakup of the USSR. Thus, data on Russia's EEI for the period 1995-2005 must be taken with caution.

*Table 7: Total energy consumption per (2000) dollar GDP, Fossil fuel consumption (FFEC) per unit of human consumption expenditure (HWE), FFEC as % of total energy consumption, and the derived Energy Efficiency Index (EEI) for select countries. FFEC/HWE is in BTU per (2005) dollar. HWE is in constant \$ 2005 PPP. Values are calculated for year 2005*

Country	Total Energy to GDP	FFEC as % of total	FFEC/HWE 1995	FFEC/HWE 2005	EEI 2005
Brazil	6,906	60%	5145	5508	0.98
China	13,919	93%	30386	28181	1.04
Croatia	7,881	79%	7875	7062	1.00
Germany	6,573	85%	7611	6732	1.05
India	7,582	92%	11911	9834	1.06
Italy	5,793	91%	6664	6488	1.01
Japan	6,636	83%	7707	7465	1.02
Korea, Rep	12,376	85%	14501	14067	1.05
Mexico	5,987	92%	7684	6511	1.06
Russia	19,950	89%	26199	17852	1.05
South Africa	20,228	98%	17627	15855	1.01
Spain	6,481	85%	6104	6455	0.94
Sweden	8,857	37%	6356	4683	1.13
Turkey	5,850	90%	5871	6032	1.02
UK	5,451	89%	7667	5765	1.15
US	9,146	85%	11499	8941	1.16

India's FFEC rose by 42% while its HWE rose by 72%, resulting in an EEI of 1.06. Spain's FFEC rose 54% while its HWE rose only 46%, resulting in a decline in overall fossil fuel energy efficiency as reflected by an EEI of 0.94. Of the countries studied, the only other one to report a decline in energy efficiency was Brazil with a CEI of 0.98.<sup>103</sup> Three countries — USA, UK and Sweden — registered EEIs of more than 1.10.

Table 8 presents historical data on changes in fossil fuel energy efficiency per unit of economic welfare from 1975 to 2005 as measured in terms of energy units per unit of HWE. It also shows the historical values for EEI from 1985 to 2005 and a 30 year average of the change in FFEC/HWE (EEI30). Of the nine countries studied, only Korea and India recorded a decline in fossil fuel energy efficiency over the period 1975-2005, as reflected in EEI30 values of less than 1.00. China registered the largest improvement over the 30 year period (65%), followed by Sweden (63%), UK (57%) and USA (56%).

<sup>103</sup> Methodology and data analysis for the Energy Efficiency Index, Saraswathi Mukkai and Ranjani Ravi, "Research Methodology and Data for a Fossil Fuel Energy Index", MSS Research Working Paper, The Mother's Service Society, September 2010. Available online [http://mssresearch.org/?q=Research\\_Methodology\\_and\\_Data\\_for\\_a\\_Fossil\\_Fuel\\_Energy\\_Index](http://mssresearch.org/?q=Research_Methodology_and_Data_for_a_Fossil_Fuel_Energy_Index).

*Table 8: Trends in Energy Efficiency Index (EEI) from 1985 to 2005 for select countries.  
FFEC/HWE is in BTU per dollar*

Country	FFEC/HWE for 1975	FFEC/HWE for 2005	EEI 1985	EEI 1990	EEI 1995	EEI 2000	EEI 2005	EEI <sub>90</sub>
China	81,589	28,181	1.22	1.16	1.04	1.09	1.04	1.65
India	8,664	9,834	1.00	0.91	0.92	0.93	1.06	0.87
Italy	10,505	6,488	1.23	1.07	1.01	1.01	1.01	1.38
Japan	13,799	7,465	1.33	1.14	1.01	1.03	1.02	1.46
Korea, Rep	11,506	14,067	0.95	1.13	0.86	0.82	1.05	0.78
Spain	7,316	6,455	1.02	1.06	1.03	1.01	0.94	1.12
Sweden	12,774	4,683	1.35	1.23	1.08	0.97	1.13	1.63
UK	13,299	5,765	1.21	1.14	1.13	1.11	1.15	1.57
US	20,161	8,941	1.40	1.26	1.07	1.08	1.16	1.56

## 11. Human Economic Welfare Index (HEWI)

Based on the analysis discussed above, we propose the creation of a new composite index that focuses on the economic dimension of human welfare. This approach can be fairly criticized as too narrow, since it gives less prominence to the issue of long term sustainability than alternatives such as GPI and ISEW. We acknowledge the validity of the criticism, but argue that an index is a tool whose ultimate value must be judged by its utility. Other indices may offer greater insight, but their inherent complexity and subjectivity as well as the difficulty in obtaining data diminishes their value as a tool for policy-making and international comparisons.

This index has been constructed with the following objectives: each component indicator should be reliable, easily and promptly available, sensitive, robust, and uniquely related to its own objective; the components should be incorporated in the composite index in such a manner that there is no cancellation; and in contrast to more comprehensive composite indicators, the number of sub-indices should be kept to the minimum possible. These objectives have been only partially met.

### 11.1 Characteristics of HEWI

1. It is denominated in international dollars adjusted for purchasing power parity.
2. It is based on data that is currently maintained by international organizations and available for 70 countries. Though we have already emphasized that some of the data is not entirely reliable, it is the best and most consistent available and free from value assessment.<sup>104</sup>
3. It is meant for use as a tool, as a policy-instrument and education of the public. Improvements in performance on HEWI are designed to broadly reflect real improvements in present and future welfare.

<sup>104</sup> Computations of GDP based on the expenditure method provide the essential information required to calculate HWE. Data for net household savings and PDI is more difficult to obtain for many developing countries. Until more accurate national accounts are available, HWE is taken as a rough approximation for PDI at the national level and consumption inequality as a rough approximation for income inequality.

## 11.2 Limitations in HEWI

It may be useful at the outset to clarify some of the limitations in this approach.

1. It partially overcomes the distorting impact of GDP by focusing on those aspects of national income that directly benefit human beings, but it does not adjust the value of national product to reflect non-monetized activities, risk and uncertainty, price distortions and the true value of quality. The absence of qualitative measures is especially relevant for assessment of progress on education and employment.
2. It is a rough indicator of sustainable development, since it does not fully reflect the real costs and risks associated with over-consumption of natural resources, pollution and other ecological, social and political issues.
3. It measures economic change, not social development, by monitoring some key determinants of sustainable economic welfare. It does not attempt to assess the underlying social, organizational, technological and cultural factors that contribute to the capacity of society to adapt and evolve over time or to the impact of social change on life styles, happiness or psychological fulfillment.
4. As with any index for international comparisons, it is constrained by the paucity and low quality of the information related to personal disposable income, inequality, employment and education.

## 11.3 Components of HEWI

HEWI improves upon GDP per capita as a measure of human economic welfare in six ways:

1. *Personal Disposable Income (PDI)* — It focuses on that part of national income which directly accrues to households and individuals for promoting human welfare, thereby avoiding the tendency to value growth for growth's sake.
2. *Human Welfare Expenditure (HWE)* — It focuses only on that part of private and public expenditure that directly promotes the welfare of human beings.
3. *Income Inequality (EWI)* — It adjusts per capita income to reflect the impact of income inequality on household economic welfare.
4. *Full Employment (FEI)* — It takes into account levels of employment and unemployment which directly impact on personal economic welfare and utilization of human capital.
5. *Combined Educational Enrollment (CEI)* — It considers the future economic impact of current investments in education.
6. *Energy Efficiency (EEI)* — It includes a measure for changes in fossil fuel energy efficiency over time as an index of ecological risk and sustainability.

Each of these components has been discussed separately in Section 10. This section summarizes each sub-index, discusses how they can be assembled into a composite index, and examines comparative data.

## 11.4 Sustainability

HEWI is based on a broad conception of sustainability that incorporates economic, ecological and social factors. It is structured to give balanced weightage to current and

future welfare. In addition to measuring personal disposable income and welfare-related consumption, it monitors two negative components that limit present welfare — income inequality and unemployment — and three positive components that have the potential to significantly enhance long term sustainability — education, energy efficiency and net household savings. Income inequality is viewed as a constraint on growth of consumer demand, which limits present consumption and employment. Unemployment is viewed as a constraint on the full utilization of human resources and social productivity, which limits the economic welfare of both the unemployed and the rest of society. Rising levels of education are viewed as an investment in human capital that promotes future economic welfare. Rising levels of fossil fuel energy efficiency are viewed as an investment in physical capital that supports future ecological welfare. Net household savings provides the financial basis for future investment and human welfare consumption.

Figure 7: Dimensions of sustainable economic welfare



## 12. Composite HEWI

The design of the component sub-indices and composite index are intended to provide a tool that is of maximum value for policy and decision-making.

### 12.1 Consumption Expenditure (HWE)

HWE represents the consumer and household-related components of GDP that most closely relate to the welfare of human beings. Comparative data for all countries is taken primarily from the UN, which presently maintains national accounts information in a common standard format for 70 countries. The calculation of HWE starts with the household consumption expenditure (HCE) component of GDP as the base, thereby omitting other GDP components related to capital formation, change in inventories, imports and exports. It then adds in those categories of government expenditure directly related to personal welfare

(HWGE), including education (Ed), health (He), housing and community amenities (HC), social protection (SP), environmental protection (EP), recreation, culture and religion (RCR), thereby omitting expenditure on general public services, defense, public order and safety, and economic affairs. The sum of the above two components is divided by the total population to derive the per capita HWE. Then per capita HWE is adjusted for 2005 international dollars PPP. HWE serves as the baseline which is adjusted by the other four sub-indices. On average the value of HWE ranges between 60 and 80% of GDP. Thus,

$$\begin{aligned} HWE &= HCE + HWGE \\ HWE &= HCE + HWGE (Ed + He + HC + SP + EP + RCR) \\ &\text{-----} (1) \end{aligned}$$

## 12.2 Personal Disposable Income (PDI)

PDI represents that portion of national income which is directly available to individuals for consumption expenditure after taxes. It is derived by extracting from GDP the data for household consumption expenditure (HCE) and adding to it the net household savings (NHS).

$$\begin{aligned} PDI &= HCE + NHS \\ &\text{-----} (1a) \end{aligned}$$

### 12.2.1 Economic Welfare Index (EWI)

The economic welfare of the population can vary widely between two countries with the same per capita income, if in one case a large percentage of GDP goes to the top 10 or 20%, while in the other it is more evenly distributed throughout the population. Therefore, HWE is adjusted to take into account the impact of income inequality on the real economic welfare of people. Here our objective is not to measure income inequality per se, which is simply a statistical result, but rather to measure the impact — the stimulating and depressing effect — of income inequality on overall human economic welfare as measured by HWE. As discussed in Section 9.2, income inequality plays both a positive and negative role in economic progress. Within certain limits it acts as a gradient or voltage differential that spurs people to aspire and strive to elevate their position to equal or exceed that of others. At the same time it concentrates disproportionate income among those with the lowest propensity to consume and the highest propensity to speculate, thereby curtailing demand for greater production and employment.

Economic Welfare Index (EWI), is a variant of Sen's SWF, in which we adjust Gini to arrive at a new coefficient,  $G_{ec}$ , which represents that proportion of Gini that is compatible with optimal levels of economic welfare as measured by household consumption expenditure.  $G_{ec}$  increases in value as Gini rises, reflecting the fact that high Gini countries have a greater potential for reducing inequality without dampening economic incentives that promote human welfare.

$$\begin{aligned} G_{ec} &= 0.65 \text{ Gini} - 0.1 \\ &\text{-----} (2) \end{aligned}$$

EWI is personal disposable income (PDI) multiplied by  $G_{ec}$  plus Government Welfare consumption expenditure on households (HWGE). Note that HWGE is not adjusted by  $G_{ec}$



since the distribution of government services is far more equitable than the distribution of income and consumption expenditure and is skewed in favor of lower income families.

$$\begin{aligned} EWI &= PDI (1 - Gec) + HWGE \\ EWI &= PDI (1.1 - 0.65G) + HWGE \\ &\text{-----} (3) \end{aligned}$$

### 12.2.2 Full Employment (FEI)

Section 10.3 discussed the importance of incorporating some measure of employment in an index of human economic welfare. In a market economy where economic survival and well-being depend on each individual's access to gainful employment, employment must be regarded as a basic human right. Rising levels of unemployment is both OECD and developing countries among youth as well as among older workers represents one of the greatest obstacles to securing economic welfare for all. Employment is related to changes in demography, education and social attitudes, such as those regarding women in the workforce. No single measure of employment can satisfactorily capture all its dimensions. Unfortunately in many countries even the most basic data on unemployment rates is unreliable, while the range of variables measured is severely limited. The composition of an employment index useful for international comparisons must work within these constraints. FEI is a composite index that takes into account levels of employment and unemployment which directly impact on personal economic welfare and national utilization of human capital.

FEI is a composite index that takes into account levels of employment and unemployment which directly impact on personal economic welfare and national utilization of human capital.

- *Employment-Population Index* — EPI is arrived at by taking the Employment-Population Ratio (EPR) for those aged 25+ and converting it into a scale ranging from .01 to 1, assuming that 66% EPR represents full employment. Countries with EPR greater than 66% are assigned a value of 1.0.
- *Adult Employment Index* — AEI measures the rate of employment among members of the labour force aged 25+. The adult unemployment rate is derived by deducting from total employment and unemployment data, those under 25 years of age. Adult underemployment is estimated by taking twice the level of adult unemployment. Thus,  $AEI = 1 - 2(AUR)$ .
- *Youth Employment Index* — YEI measures the rate of employment among members of the labour force aged 15-24. It is derived by taking 1 minus the youth unemployment rate for ages 15-24 (YUR). In consideration of the great importance of providing employment opportunities to the young generation, we have assigned an equal weightage to YEI and AEI, even though the percentage of youth in the workforce ranges from 10 to 50% in different countries.  $YEI = 1 - YUR$ .
- *Job Creation Index* — JCR measures the net change in the total number of jobs from year to year, which serves as the basis for the index, JCI.  $JCI = (1 + JCR) = JCI = 1 + \frac{TE_2 - TE_1}{TE_1}$  where TE1 & TE2 are total employment in the previous and subsequent year. A value less than one for JCI signifies a decline in total employment from the previous year. A value of more than one signifies an increase in employment. Thus, a growth rate of employment of 10% would be indicated by a value of 1.10.

### 12.2.3 Full Employment Index

(FEI) is a composite index equal to the average of the four sub-indices. FEI could be greater than 1.0 if JCI is very large. FEI is expressed by the formula

$$FEI = \frac{EPI + AEI + YEI + JCI}{4}$$

-----(4)

The function  $EWI * FEI$  reflects the impact of employment on human economic welfare.

### 12.2.4 Combined Educational Enrollment Index (CEI)

CEI considers the future economic impact of current investments in education based on current school enrollment rates. It is based on the combined gross enrollment rates for primary (PER), secondary (SER) and tertiary (TER) levels normalized to 100% by UNDP and incorporated in the HDI index (CGER). CGER is modified to assign double weightage to changes in tertiary enrollment rates. We designate this modified CGER as  $CER_H$ .

$$CER_H = \frac{3CGER + TER}{4}$$

$$CER_H = 0.33 PER + 0.23 SER + 0.44 TER$$

-----(5)

In recognition of the time lag between acquisition of education and its impact on economic activity, we define the Combined Education Index (CEI) through  $CER_{\Delta n}$ .

$$CEI_n = 1 + [1.0 * CER_{\Delta(n-5)} + 0.9 * CER_{\Delta(n-6)} + 0.81 * CER_{\Delta(n-7)} + \dots 0.14 * CER_{\Delta(n-25)}]$$

-----(6)

Where

$$CER_{\Delta n} = CER_{Hn} - CER_{H(n-1)}$$

----- (6a)

$CER_{\Delta n}$  measures the absolute change in combined enrollment levels over time given by formula (6a). CEI measures the cumulative impact of that change on human economic welfare at any point during 25 years in time subsequent to the change in  $CER_H$ . As the more educated youth enter the workforce and the impact of rising levels of education gradually impacts on actual GDP and HWE, the factor multiplying  $CER_{\Delta n}$ , i.e. 1, 0.9, 0.81 etc. for past educational achievements declines proportionately. Namely, we argue that the impact of earlier education enrollment is already included in the GDP and in our HWE.

### 12.3 Energy Efficiency (EEI)

EEI is an index of sustainability based on fossil fuel energy efficiency (FFEC) per unit of consumption expenditure (HWE). The index measures the consumption of energy generated from fossil fuel sources, which are non-renewable and release  $CO_2$  into the atmosphere. Note that by basing the measure of fuel efficiency on HWE rather than GDP, which is commonly used, we assess the extent to which energy is being efficiently utilized for the ultimate benefit

of human beings, not merely for production and growth for their own sake. In calculating EEI, we take into account the long gestation period and long life span of investments in renewable energy and energy efficiency. For the purpose of this study, we have used a period of 10 years. The index measures the change in fossil fuel energy efficiency over time, where  $FFEC_1$  and  $FFEC_2$  represent fossil fuel energy consumption in year one and two and  $HWE_1$  and  $HWE_{10}$  represent human welfare consumption expenditure year one and two.  $FFER$  is the ratio of fossil fuel to HWE.  $FFER_{\Delta 1}$  is the change in the ratio for year one.  $FFER_{\Delta-1}$  is the change in the ratio the previous year.  $FFER_{\Delta-2}$ , etc. are defined analogously.

$$FFER_{\Delta 1} = \frac{\left\{ \frac{FFEC_1}{HWE_1} \right\} - \left\{ \frac{FFEC_0}{HWE_0} \right\}}{\left\{ \frac{FFEC_0}{HWE_0} \right\}}$$

The Energy Efficiency Index EEI for any year assigns present value ( $V_{FFER}$ ) to changes in  $FFER$  during the previous 10 years as represented by  $FFER_{\Delta-1}$ ,  $FFER_{\Delta-2}$  ...  $FFER_{\Delta-10}$ .  $V_{FFER}$  starts with a value of 1 and diminished at the rate of 0.1 per year. Thus,  $V_{FFER-1} = 1$ ,  $V_{FFER-2} = 0.9$ ,  $V_{FFER-3} = 0.8$ , .....  $V_{FFER-11} = 0.0$ . EEI is given by

$$EEI_1 = 1 - [(V_{FFER-1} \times FFER_{\Delta-1}) + (V_{FFER-2} \times FFER_{\Delta-2}) + \dots + (V_{FFER-10} \times FFER_{\Delta-10})]$$

$$EEI_1 = 1 - [(0.1 \times FFER_{\Delta-1}) + (0.2 \times FFER_{\Delta-2}) + \dots + (1.0 \times FFER_{\Delta-10})]$$

----- (7)

As EEI increases, the number within brackets becomes more negative in value. EEI increases either as a result of improving overall energy efficiency per unit of HWE or by replacing fossil fuel with renewable energy sources, i.e. either by decreasing  $FFEC$  or by increasing HWE.

#### 12.4 Human Economic Welfare Index (HEWI)

We define the Human Economic Welfare Index by the formula:

$$HEWI = EWI * FEI * CEI * EEI$$

----- (8)

##### 12.4.1 HEWI 2005

In Table 9 below, columns A-C show the per capita GDP, PDI, and EWI (PDI adjusted for inequality in PPP 2005 international dollars). Columns D-F show scores on the indices for employment, education and energy. Columns G & H show the final adjusted human welfare index HEWI and HEWI as a % of per capita GDP. Data is for 2005.

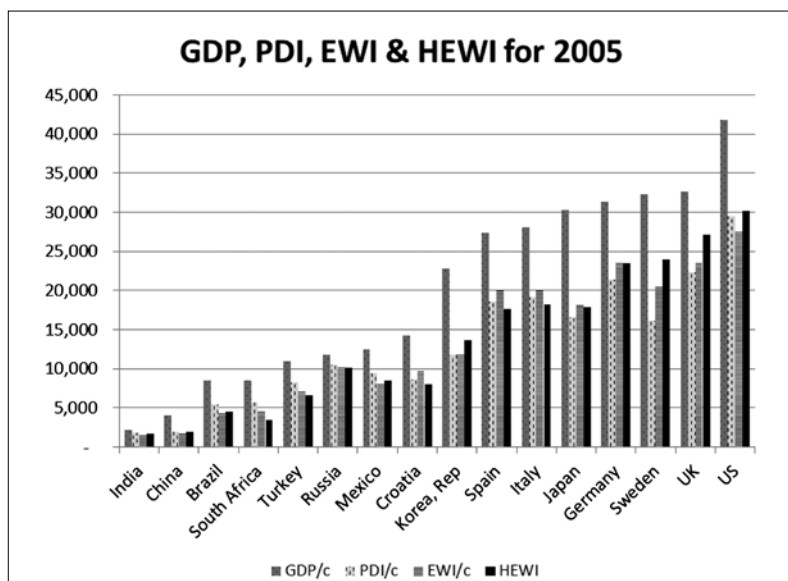
As we saw earlier, USA ranks 1st in GDP per capita with a value 28% higher than 2nd ranked UK; but when compared in terms of HEWI, the US is only 11% higher. The GDP gap between USA and Sweden is 29%, while in terms of HEWI it is 26%. As we saw in Table 2, US retains a far larger percentage of GDP as personal disposable income (71% vs. 50% for Sweden). Sweden performs better on inequality and education, USA on employment and energy. Russia (85%), UK (83%) and India (76%) record the highest values for HEWI as a percentage of GDP. South Africa (41%), China (47%) and Brazil (53%) record the lowest ratio of HEWI to GDP.

Figure 8 shows the relative differences between GDP, PDI, EWI and HEWI for year 2005.

Table 9: HEWI as % of GDP/c, PDI and EWI. Values are for year 2005.

	A	B	C	D	E	F	G	H
Country	GDP	PDI	EWI	FEI	CEI	EEI	HEWI	HEWI as % of GDP
India	2,234	1,821	1,638	0.96	1.02	1.06	1,702	76%
China	4,076	2,019	1,827	0.96	1.06	1.04	1,924	47%
South Africa	8,504	5,782	4,690	0.69	1.06	1.01	3,465	41%
Brazil	8,505	5,459	4,420	0.92	1.12	0.98	4,479	53%
Turkey	10,977	8,291	7,112	0.84	1.08	1.02	6,596	60%
Croatia	14,271	8,667	9,720	0.80	1.03	1.00	8,032	56%
Mexico	12,563	9,492	8,060	0.96	1.04	1.06	8,466	67%
Russia	11,861	10,564	10,297	0.92	1.02	1.05	10,119	85%
Korea, Rep	22,783	11,875	11,764	0.95	1.16	1.05	13,606	60%
Spain	27,377	18,569	20,057	0.86	1.09	0.94	17,676	65%
Japan	30,310	16,571	18,186	0.92	1.05	1.02	17,916	59%
Italy	28,144	19,205	20,082	0.83	1.08	1.01	18,196	65%
Germany	31,378	21,449	23,700	0.85	1.11	1.05	23,504	75%
Sweden	32,319	16,183	20,592	0.89	1.16	1.13	24,001	74%
UK	32,690	22,364	23,488	0.91	1.10	1.15	27,196	83%
US	41,833	29,516	27,483	0.93	1.01	1.16	30,146	72%

Figure 8: GDP/c, PDI/c, EWI/c and HEWI for year 2005



### 12.4.2 Historical HEWI 1985-2005

Table 10 presents historical data on HEWI for select countries from 1985 to 2005 along with their relative rank order during the period. We select here a few countries for historical analysis to illustrate how HEWI can be applied to gain insight into the development of human economic welfare over longer periods of time.<sup>105</sup>

### 12.4.3 Discussion

Our discussion concerns the period 1980 to 2005 and, therefore, omits the present economic crisis. In Table 9 we compare the performance of 16 countries on GDP/c and with the proposed index HEWI, including the effects of each sub-index: PDI and EWI as well as FEI, CEI and EEI. This allows us to assess whether and if, to what extent, HEWI provides better insight into changes in human economic welfare than GDP/c.

- *Korea*

*HEWI vs. GDP:* Of the nine countries analyzed historically for the period 1985 to 2005, Korea, as well as China, registered the largest increase in HEWI (202%), while its per capita GDP also grew by 202%. Thus, HEWI rose at the very same rate as GDP, signifying that country followed a human welfare-oriented development strategy.

*HWGE:* Progress on the human welfare index was buoyed by a 262% rise in Government welfare-related expenditure, signifying a conscious effort of the government to direct the gains of economic growth for human welfare.

*G<sub>ec</sub>:* Korea scores relatively well on income inequality with a  $G_{ec}$  value of 0.10, down from 0.12 in 1975 and a Gini of 0.31 in 2005. This is the lowest value of the countries studied after Sweden, demonstrating its serious commitment to the equitable distribution of the gains of economic growth. Recall that  $G_{ec}$  measures income inequality against a hypothetical state of 'optimal welfare inequality' in which both overall human welfare and equitable distribution are in optimal balance.

*FEI:* Korea maintained one of the highest performances of any country on the employment index, averaging 0.96 on FEI over 20 years, as shown in Table 4.

*CEI:* Korea's combined enrollment rate (CER<sub>H25</sub>) rose from 0.56 to 0.96 in 25 years, giving it the highest CER<sub>H25</sub> value of 1.70 of all the countries studied.

*EEI:* These impressive gains were offset to some extent by a gradual increase in Korea's energy intensity as a result of heavy dependence on manufacturing in the composition of its economic growth, which constitutes 39% of Korean GDP vs. 22% for USA and Japan and 25% for the EU). The country remains dependent on fossil fuel for 85% of its energy needs, down from 98% in 1975. According to International Energy Agency, Korea's overall energy intensity for all forms of energy (measured in terms of GDP per unit energy consumption) declined 54% from 1980 to 2006, but still overall energy intensity per unit of GDP is high compared with many OECD countries, 50% higher than USA and almost double that of Japan.<sup>106</sup> Although energy intensity per unit of GDP declined, fossil fuel intensity per unit

<sup>105</sup> Research data on specific countries. MSS Research Working Paper, The Mother's Service Society, September 2010. Available online <http://mssresearch.org/?q=HEWI-Human-Economic-Welfare-Index-Country-Studies>.

<sup>106</sup> International Energy Agency data for GDP per unit of energy consumed and World Bank data for GDP (PPP). Accessed August 20, 2010, <http://www.eia.doe.gov/pub/international/iealf/tablee1p.xls>

of HWE actually rose between 1975 (the base year for the 1985 EEI) and 2005 as shown by the value for EEI30 of 0.78 in Table 8, signifying a significant decline in fossil fuel energy efficiency over 30 years, although the trend has reversed after 2000, probably as the result of a 22% rise in HWE vs. a 15% rise in FFEC. Korea still pursues an energy intensive and fossil fuel energy intense strategy which is unsustainable and a poor model for other nations to emulate. The lengthy discussion of EEI is necessitated by the fact that we have not divided the index into sub-indices that transparently reveal the sources of variation in the overall index, an omission to be corrected in future versions.

Thus, HEWI provides both an overview of Korea's progress on human welfare as well as insights into the sustainability of its strategy. It scores impressively on development of human capital through high investment in education, high levels of employment and continuous gains on income distribution. Excessive dependence on an energy-intensive fossil fuel strategy represents Korea's largest obstacle to sustainable human welfare, although the most recent trend is encouraging. With the crucial exception of energy, Korea's performance demonstrates that progressive welfare related strategies can significantly magnify the welfare benefits of economic growth in a sustainable manner.

- *Japan*

*HEWI vs. GDP:* In contrast, Japan's HEWI/c rose just 1% between 1985 and 2005, the smallest gains of any country studied, in spite of a 44% growth in GDP/c during this period.

*HCE & HWGE:* Government welfare expenditure grew faster (110%) than GDP, while growth of household expenditure just kept pace with GDP. Inequality declined by 19% over the 20 years as a result of this government transfer.

*NHS:* Net savings declined from 12% to 1% of GDP, signifying that households are relying increasingly on past savings and current debt to sustain their high level of personal consumption.

*Gec:* The level of income inequality has declined by 19%, from a Gec value of 0.13 in 1985 to 0.11 in 2005. While this performance was better than most countries, which recorded a rise in inequality during this period, the gains were modest and the absolute level of inequality leaves considerable scope for further reduction.

*FEI:* Although once regarded as a model for employment security, Japan's employment index declined by 5% since 1985 to 0.93 in 2005.

*CEI:* Japan's CERH25 is 1.2, reflecting an increase in CERH from 67% to 78% during the period 1980-2005. This growth rate ranks lowest of the countries studied along with USA, but the absolute level of enrollment in USA is far higher (90% vs. 78% for Japan).

*EEI:* Although Japan's overall energy efficiency (gdp per unit energy) improved 25% from 1975 to 2005, its fossil fuel efficiency for human welfare (FFEC/HWE) as measured by EEI rose 46%. Significant gains were achieved up to 1990 while GDP was still growing rapidly. Since then progress on EEI has been negligible. From 1995 to 2005, Japan's EEI averaged 1.02. Japan still remains highly dependent on fossil fuels for 91% of its total energy. In absolute terms, Japan's FFEC/HWE is equivalent to the average of all the countries studied, excluding China. Its current fossil fuel energy efficiency is 89% higher than Korea, 278% higher than China, and 20% better than USA.

In combination, these indices indicate a country which has stagnated both economically and in terms of its efforts to boost human welfare. During this period, levels of household

savings and employment declined, education grew slowly, and inequality declined slightly. Improvement on EEI is the most notable gain for Japan during the period, but its high dependence on fossil fuels makes this present course unsustainable.

- *China & India*

*HEWI vs. GDP:* When viewed from a historical perspective, China's position relative to India changes dramatically. Although China started in 1985 from a GDP/c (PPP) 19% lower than India's and a HEWI 22% lower, China's GDP has risen by 401% and its HEWI by 202%. In contrast, India's GDP rose by 122% and its HEWI by 108%, signifying slower growth but growth more oriented to human welfare than in China.

*HCE & HWGE:* China's household consumer expenditure has grown (223%) at just half the rate of GDP growth, while India's increased 79% in real terms. China's government welfare-related spending grew even faster than GDP (463%), while India's grew at a slightly slower pace than GDP (118%).

*NHS:* Both countries achieved notable gains in net household savings. China's rose from 10 to 24% of personal disposable income, while India's grew from 19% to 30%.

*Gec:* Income inequality in China has risen by 63% as measured by Gec, whereas India's increased by a much lower value of 29%, which has significant impact on the distribution of economic gains throughout the population.

*FEI:* Historical data from ILO for both China and India indicate a continuously high score on employment, but the reliability of this data is highly questionable, so we prefer to discount its value.

*CEI:* India started out with a lower enrollment base (29% lower in 1975) as measured by CERH than China (42%), however it has grown at nearly twice the rate with a CERH25 of 1.5 vs. 1.3 for China. Both countries have enormous scope for enhancing both the quantity and quality of education. Indeed, investment in education may be the single most important lever for enhancing human economic welfare in both countries.

*EEI:* China's total energy intensity per unit GDP has declined by 63% over the past three decades, but its absolute energy intensity is still double that of Japan and 46% higher than India's.<sup>107</sup> Both countries depend on fossil fuels for more than 90% of their energy needs. India's fossil fuel energy efficiency (FFEC/HWE) is about one-third that of China, meaning India produces nearly three times more HWE per unit of fossil fuel. China's performance on EEI has declined drastically from 1.22 in 1985 to 1.04 in 2005, signifying much slower progress on this factor than in the past. In both absolute terms and in terms of trends, China is pursuing an unsustainable and inefficient path for enhancing human economic welfare. In this context, China has taken considerable effort in recent years to develop renewable energy resources in order to address this imbalance. Today China produces more than half of the world's supply of solar panels and almost half its wind turbines.

- *USA & UK*

*HEWI vs. GDP:* USA's real per capita GDP (PPP) grew by 46% from 1985-2005, while per capita economic welfare as measured by HEWI rose just 9%. By comparison, UK's GDP grew by 60% while its HEWI rose by 74%. Among OECD countries, the US performance

---

<sup>107</sup> *Ibid.*

was slightly better than Japan's 1% and Italy's 4%, but far below Korea's 202% and Spain's 104%. Although USA retained the first rank in GDP and HEWI among the countries studied throughout the period, the difference between US and second ranked UK in GDP shrank from 40% in 1985 to 28% in 2005 and in HEWI it shrank from 76% to 11%.

*HCE & HWGE:* US household consumption expenditure rose by 54% and government welfare-related expenditure rose 33% over the two decades. By comparison, UK's HCE rose 80% and its HWGE rose 63%.

*NHS:* US net household savings declined from 9% to zero during the same period, while UK NHS fell from 10% to 4%.

*Gec:* Welfare related income inequality as measured by Gec in the USA rose 21% from 0.12 to 0.15, which means that human welfare as measured by HEWI is reduced by 15% due to non-optimal income distribution. Of course, the actual levels of income inequality as measured by Gini are much higher at 0.38 in 2005. By comparison, UK's Gec rose by 50%, but remains 20% lower in absolute terms at 0.12.

*FEI:* US performance on employment remained constant over the 20 years (.92-.93), though its FEI has fallen by an estimated 4% since 2005. UK's employment performance has risen nearly to USA levels, rising from 0.86 in 1985 to 0.91 in 2005.

*CEI:* From 1980 to 2005, US raised its overall CER<sub>H25</sub> by 20%, which largely reflects a rise in tertiary enrollment from 56% to 82%. By comparison, UK raised its CER<sub>H25</sub> 40%, including a 212% rise in tertiary enrollment from 19% to 59%. During this period, US fell from first to second place in both total enrollment and tertiary enrollment behind Korea.

*EEL:* In terms of overall energy efficiency measured by GDP per unit energy consumed, both UK and US reduced its energy intensity by 42% between 1980 and 2006. In absolute terms, UK produces 69% more GDP per unit of energy than USA. Both countries remain highly dependent on fossil fuels — 85% in USA, 89% in UK. Both substantially improved fossil fuel energy efficiency as measured in terms of FFEC per unit HWE from 1975 to 2005 — the US by 56% and UK by 57% as shown in Table 8.

As a result of these differences in performance, UK has substantially closed the gap with USA on HEWI. It performs substantially better on HCE, HWGE, NHS, significantly better on Gec and slightly better on EEL. On FEI US scores higher, but remained flat while UK raised its performance. Although there is still a 28% gap in GDP between the two countries, the UK's continuously higher investment in education is likely to reduce that difference significantly. Based on present trends, its HEWI may exceed the US level over the next few years.

The comparative historical analysis is not intended to be comprehensive or in-depth, but rather to illustrate how HEWI and its sub-indices can be utilized to gain insight into the real impact of economic growth on human welfare and some of the critical policy issues that need to be addressed in order to enhance that performance.

*For the latest information and research papers on HEWI and its sub-indices, our statistical methods and the country studies, please visit the HEWI project pages on [www.neweconomictheory.org](http://www.neweconomictheory.org)<sup>107</sup> or at [www.mssresearch.org](http://www.mssresearch.org).*

---

<sup>107</sup> Statistical Methods and the Country Studies on HEWI Project. Available online <http://neweconomictheory.org/content/hewi-human-economic-welfare-indicators-project>.



## 13. Conclusions

### *13.1 Economic Policy Implications of HEWI*

In contrast to most other composite economic indicators developed or proposed in recent years, HEWI incorporates a minimum number of sub-indicators. In addition, each indicator is uniquely related to its own objective and there is no cancellation effect between the sub-indices. In this way the policy implications of each measure can be derived from the individual sub-indices and the resultant measure is made transparent to facilitate decision-making. Of course, we readily concede the limitations of this broad approach. For instance, FEI does not distinguish between the type or quality of new jobs created, whether they are in healthcare and education or in the military, construction and road building, whether these jobs generate pollution or improve energy efficiency. Therefore, although FEI does measure components of employment, it is only a partial quantitative measure. Similar constraints apply to CEI and EEI as well. In spite of these inadequacies, we believe that HEWI can serve as relevant and useful tool for assessment and decision-making.

The relationship between measurement, theory and decision-making may be usefully illustrated by comparing economy and health care. The principal aim of both activities is to promote human well-being. Both activities are extremely complex. Healthcare draws on knowledge from the life sciences, fields which are based on sound theory. Measurements are used extensively in health care to formulate diagnoses. Some health care “measurements”, e.g. X-rays, are useful, but at the same time detrimental to the patient. The decision whether or not to apply these measures requires careful assessment of the patient’s condition, always keeping in mind the essential goal, human well-being. Although healthcare is based on sound underlying theory, it is subject to real uncertainties and risks, as it is based on incomplete information, which sometimes generates unexpected complications and cascading negative consequences. Comparing this chaotic behavior with the butterfly effect observed in classical physics underlines the enormous complexity in healthcare as well as economy. The status of theory in economy is far less satisfactory. We use mathematical models, but we lack adequate theory to explain underlying causes, social processes and consequences. We also face extreme difficulties in obtaining precise, timely information. In economy also “measurements” can be detrimental, as in the case of GDP. Wrong, inaccurate or misleading measures, rightly or wrongly applied, can lead to wrong public policy as well as wrong perceptions and actions by the general public. In healthcare our aim is to restore the patient to normal health — not to fully understand the problem, though understanding the problem certainly helps. In economy we start from a position of insufficiency characterized by widespread poverty, endemic underemployment, inadequate development of human capital, financial instability and activities with dangerously unsustainable environmental consequences. In healthcare, illness represents a disturbance of the natural harmony of the human body, which may be acute or chronic. In economy, too, both acute and chronic imbalances are possible. Indications are that the present system is perpetually out of balance. Here we will never succeed in evolving effective and sustainable policies until we arrive at a more comprehensive theoretical knowledge on which to base our actions. Until then we must have the frankness and modesty to admit the limits to our knowledge and the insufficiency of our measures. With this qualification in mind, the development and application of new measures such as HEWI can be of great practical value for enhancing public policy and initiative.

HEWI seeks to provide policy-makers with a clear and focused set of indicators that can serve as a basis for a broad range of initiatives designed to enhance human or household

economic welfare with a focus on future sustainability. While the composite HEWI can serve as an overall index of progress, the component indices and their sub-indices can provide specific guidance on ways to improve overall performance. For example, performance on the Full Employment Index (FEI) can be directly enhanced by measures which reduce youth and adult unemployment, raise the employment to population ratio or stimulate net new job creation. Other policy measures that can be directly deduced and monitored by HEWI include:

1. Redirect national expenditure from non-consumer-related categories of expenditure such as defense and general administration to greater investments in human welfare.
2. Revise policies to reduce income inequality, which might include minimum wage legislation, land reform, increased investment in education, labor market policies, innovative tax and transfer policies such as changes in employee taxation and capital gains as well as taxing of speculative investments and foreign exchange transactions.
3. Promote full employment policies such as national legislation guaranteeing the right to work, temporary public job programs, vocational training programs, work-for-welfare, entrepreneurship development, micro-credit, and internet-based self-employment programs.
4. Promote measures designed to increase energy efficiency, while shifting reliance from fossil fuels to renewable energy sources.
5. Provide financial and social incentives to raise educational enrollment rates, including national legislation to raise the mandatory minimum level of schooling by two years.
6. Promote development-oriented policies such as those that increase the speed of communication, transportation, financial transactions, technology dissemination and adoption, and government decision-making as a stimulus to all economic activity.

### *13.2 Beyond HEWI*

In this paper we have tried to emphasize the crucially important role that measurement plays in human progress and the justification for continuous efforts to improve existing measures and develop better ones. The paper examines some of the most widely-accepted limitations in GDP as a measure of human economic welfare and explores some alternative approaches to compensate for its deficiencies. We have drawn attention to the considerable challenges implicit in this effort, which are only partially addressed by alternative approaches, including our own. We have also tried to suggest that in an effort to evolve more comprehensive and inclusive indices, we should take care not to sacrifice clarity and specificity.

We cannot overemphasize the potential value of precise information for enhancing economic welfare. While national accounts data is available for all OECD countries and for 70 countries through the UN, net household savings, disposable incomes, unemployment and reliable enrollment rates are not available for many countries. Availability is one thing, reliability is another. Too often governments feel constrained to manipulate data to meet domestic political concerns or international pressures, as the recent controversy over Greek financial reporting illustrates. The paucity of timely and reliable data is a serious impediment to immediate application of this and alternative measures on a global basis. More importantly, it is also a serious impediment to optimizing policy-making to maximize human welfare.

Where data is available, it is also necessary to keep in mind that, like everything else, our accounting systems and measures are undergoing a process of evolution. Measurement

of almost everything, everywhere is more accurate and comprehensive than in the past. Historical comparisons often reflect changes in our measures as much as they reflect changes in actual performance. As Indian leaders realized 30 years ago, data must always be validated by observable facts and confirmed by intuitive judgment.

Ultimately, good measures must be judged by the policy decisions they engender. Therefore, we have tried to emphasize practical utility over technical perfection. Regardless of the inaccuracies and approximations they may contain, we believe HEWI and its sub-indices can provide sound direction for policies that focus on what must be considered the most central objective of every society; enhancing human welfare, not economic growth for its own sake. Comparative rank order indices may be a source of pride or humiliation, and both can be serviceable if they prompt us and others to more effective action. Comprehensive composite indices alert us to crucial issues of sustainability, but may overwhelm us with so much information and so many priorities that they deter rather than facilitate concerted action. All indices incorporate arbitrary and subjective assumptions, whether implicit or explicit. GDP itself is a measure of gross economic activity, but it is widely being applied as an indicator of human welfare and social progress. As a measure of activity it contains faults, but it may still be serviceable for some purposes. As an indicator of economic or social welfare, it is deeply flawed and dangerously misleading.

Our objective here has been to present the framework for an indicator of economic welfare derived from GDP that compensates for some, but not all, of its most serious deficiencies. We seek to illustrate the potential for an alternative approach which offers considerable advantages and yet keeps centrally focused on human economic welfare. Many commendable efforts are underway to improve on measurement of economic performance, some more narrowly and others more broadly focused than HEWI. There is a place and role for numerous approaches. The narrowest measures will help us to improve precision. The broadest serve as a constant reminder of the wider social and ecological context on which all economic activity is founded and carried out.

An evolutionary perspective highlights the fact that economic growth is one expression of the more fundamental process of social development, which occurs simultaneously in all fields and determines the course of political, social, economic, demographic, ecological, and cultural progress. Thus far all of the indices related to economic and social development focus almost exclusively on the measurement of results. But as we described above, social development is not a result or even a set of results, but an on-going process of progress by which humanity acquires increasing knowledge, skill and organizational capacity to achieve the goals it aspires for. An index of end results serves a limited purpose by telling us how fast and how far we are moving in the right direction and how close we are to achieving the goals we aspire toward. But a process-based index will go much further. To the degree it is perfected, it will provide insight into the essential steps of the underlying social process as well as their sequencing and timing. We hope that this paper will act as an impetus for others to suggest necessary modifications and improvements to this as well as alternative frameworks.

#### *Acknowledgements*

*The authors gratefully acknowledge the research assistance provided by Saraswathi Mukkai, Ranjani Ravi and R. Lakshmipriya of The Mother's Service Society, Pondicherry, India ([www.mssresearch.org](http://www.mssresearch.org)).*

## ***DOCUMENTS***

### **Transforming Finance Group's Call Recognizes Finance as a Global Commons**

from Ethical Markets: [www.ethicalmarkets.com](http://www.ethicalmarkets.com)

**Hazel Henderson**, President

The Committee on Transforming Finance, a multinational network of career market participants: investors, asset managers, business executives, philanthropists, academics and financial authors, holds that the financial system is a global commons and calls for a new set of rules that would allow it to be governed in full conformance with this reality.

We as beneficiaries and active participants in capital markets affirm our responsibility to reform them from within, so that all those still-voiceless stakeholders who are now excluded and exploited can be heard and their communities appropriately served. If we are to avoid future systemic failures in the global financial system, we must re-think the underlying design flaws that precipitated the financial crises. We must move beyond Bretton Woods, where this financial commons was first defined within a set of global rules and institutions in 1945, as well as beyond recent attempts at reforms that have not addressed fundamental questions, including:

- What is the purpose of finance in human societies?
- What human values and principles should guide finance and its institutions?
- What are the limits of markets, money-based trading and transacting within the global commons?
- How can finance serve equitable, ecologically-sustainable governance of the global commons (climate, biodiversity, oceans, atmosphere, space) while reducing inequality, respecting human rights and acknowledging non-market-based, traditional societies?

Because we all benefit from healthy eco-systems, financially sound institutions and thriving human communities, rethinking the design assumptions of the regulatory framework of capital markets is an urgent global priority. Our call comes in the face of insufficient response by national governments to the financial crisis of 2008-2009, the demonstrated failure of traditional economics theory that markets are efficient in allocating capital, growing global interdependence, intensifying environmental crises, global social inequity and the technological interconnectedness of global financial markets. These 24-hour markets are dependent on satellites, internet and other technologies which were largely financed by taxpayers as public infrastructure investments.

Financial markets are founded on trust — now eroded by the irresponsible and unethical behavior of many players, including many of our leading financial institutions. Unbridled, greed-driven speculation, the improper use of public infrastructure technology for activities such as high-frequency trading, together with a misguided self-regulatory ideology reduced system resilience, damaged trust and thereby damaged the financial system commons. This

led to unhealthy “financialization” now dominating vital businesses and activities in the world’s real economies. In order to re-build trust, the Transforming Finance initiative seeks to democratize finance and widen the debate on reform by including all stakeholders and the innovations of many experts and groups advocating deeper re-structuring and reforms.

The key operating mechanisms necessary to build trust in the Global Financial Commons include:

- Stabilizing the value of national currencies and establishing a reliable global currency regime.
- Channeling savings into productive and sustainable investments that build real wealth.
- Managing fail-safe, transparent payment and settlement systems.
- Appropriate, dependable, transparent tools for managing financial risks and assuring that issuers, insurers and counterparties are accountable.

To correctly reframe global finance as a commons, the finance system needs to incorporate the following commons principles:

- Stakeholder co-governance,
- Access for all participants without sudden, cyclical capital market disruptions,
- Acknowledgment of the intrinsic value and assignment of rights to the environment,
- Decision-making at the most local level possible (subsidiarity),
- A commitment to environmental sustainability and social justice globally.

Since Bretton Woods, this commons approach has been expanded and well articulated in the theories of global public goods and their financing, and in many international UN conventions: the International Labor Organization (ILO), International Telecommunications Union (ITU), the World Trade Organization (WTO) and the international rule-making bodies for securities exchanges and accounting standards as well as the Universal Postal Union, the International Air Transport Association (IATA) and the UN Principle for Responsible Investing. Many multi-stakeholder groups include the carbon market of the Kyoto Protocol and its Clean Development Mechanism (CDM), the Global Reporting Initiative, the Club of Rome, the Carbon Disclosure Project, the World Social Forum, the Earth Council, the Dag Hammarskjöld Foundation, and financial groups, including the Investors Network on Climate Change, the Microcredit Summit Campaign, New Rules for Bretton Woods, the Global Compact and the Institutional Investors Group on Climate Change.

The conventional wisdom of the “tragedy of the commons” articulated by biologist Garrett Hardin (Science, 13 December 1968, 1243) who maintained that common property is poorly managed, was based on outdated economic theory now challenged by endocrinologists, behavioral and brain sciences. This outdated view has been challenged by many scholars, who have documented how many societies over centuries have developed sophisticated mechanisms for sustainable decision-making and rule enforcement to handle conflicts of interest, allocation of common resources and rights.

We applaud the progress made by many innovators and groups as traditional markets for what economists call “rival goods” have morphed toward serving today’s markets based on new common scarcities and needs of the now 6.8 billion member human family for: clean air and water, restoring lands, forests, biodiversity and providing sustainable ecosystem productivity and stabilizing our global climate. These new needs require a commons approach where markets, as tools, can be designed to allocate these indivisible “non-rival” public

goods and infrastructures for equitable access and opportunities for human development. Traditional competition for private goods is complemented by cooperation in organizing larger markets for public goods and services.

We will continue our own efforts to modernize capital markets to serve human societies as one of the tools for managing the global commons. As our Chinese colleagues say, markets are good servants but bad masters. Thus we will continue re-designing models of asset-management beyond outdated “efficient markets” and “rational actors” theories to expand use of “triple bottom line,” ESG (environment, social, governance), integrated, ethical auditing standards and the criteria of thermodynamic efficiency: Energy Return on Investment (EROI) as well as Social Return on Investment (SROI). Prices must include social and environmental costs of production reflected in company accounts. Corporate funds and private money should never corrupt votes in politics.

Beyond these new company accounting standards, we support similar innovations to overhaul GNP/GDP money-based measures of national progress still using obsolete macroeconomics, ignoring social and environmental costs in national accounts (UNSNA). Beyond economics, systems metrics include the many indicators of health, education, environment, poverty gaps and quality of life, human wellbeing and goals of happiness presented at the European Union’s Beyond GDP Conference, November 2007 ([www.beyond-gdp.eu](http://www.beyond-gdp.eu)), and the global survey, International Public Opinion Measuring National Progress: 2007, by Globescan and Ethical Markets Media which found huge majorities in Australia, Brazil, Canada, France, Germany, Great Britain, India, Italy, Kenya and Russia that favor including these new indicators of human development. The next survey update will be released by the BBC in late 2010, including China and the USA.

We draw attention to many innovations to serve our common needs in stabilizing climate and creating equitable tools for the Kyoto Protocol beyond 2012, including: a floor price on carbon, removing the billions of dollar subsidies on fossil fuels, equitably allocating by auction all permits to emit carbon, reforming the Clean Development Mechanism and assuring that markets created for reducing atmospheric carbon and other pollutants damaging air, water, biodiversity and ecosystems are transparent, strictly regulated to prevent speculation. We recommend that proceeds from any sale of permits accrue to the public at large and to citizens of each country, and to finance the new 21st century infrastructure and public goods required in the global transition now underway from early Industrial Era technologies based on fossil fuels and unsustainable resource extraction ([www.GTInitiative.org](http://www.GTInitiative.org)).

The shift to cleaner, greener, information- rich, more sustainable, equitable economies of the Solar Age is accelerating, as measured by the Green Transition Scoreboard. We support the carbon market of the UNFCCC and the proposed International Bank for Environmental Settlements ([www.undp.org](http://www.undp.org)), both which were authored by Graciela Chichilnisky, and expanding the “common trust” models of Alaska’s Permanent Fund and the Norwegian Fund for holding revenues from oil in trust for all citizens and future generations, and that these trust funds (Peter Barnes, *Who Owns the Sky?*, 2001) include other energy resources: solar wind, geothermal, hydro, etc.

Therefore, we the undersigned share a vision of a world in which the financial system serves a flourishing and sustainable human, ecological and spiritual future. We pledge to continue our efforts in Transforming Finance and invite all others who share and work toward these goals to co-sign this declaration.

### *Co-conveners of the Committee on Transforming Finance*

Hazel Henderson, D.Sc.Hon., FRSA, author, President and Founder, Ethical Markets Media (USA and Brazil), syndicated columnist, InterPress Service, member, Club of Rome.

Ethical Markets is an independent, multi-media social enterprise which covers news of ethical markets, investing and business as well as growth of the green economy worldwide.

John Fullerton, MBA, Founder, Capital Institute, former Managing Director, J.P.Morgan.

Prof. Leo Burke, Mendoza School of Business, University of Notre Dame.

Steve Waddell, MBA, Ph.D, author, Societal Learning and Change: Innovation with Multi-Stakeholder Strategies, Principal of NetworkingAction.

### *Drafting Committee on Transforming Finance*

Ellen Hodgson Brown, JD, author, Web of Debt, columnist, Huffington Post.

Prof. Graciela Chichilnisky, Columbia University, UNESCO Chair in Economics and Statistics, author, Saving Kyoto, creator of the International banks for Environmental Settlements and the carbon market of the Kyoto Protocol.

Prof. Zhouying Jin, author, Global Technological Change, Chinese Academy of Social Sciences, Beijing.

Alan F Kay, PhD, founder AutEx, author, Locating Consensus for Democracy.

Karl Kleissner, PhD, Co-founder KL Felicitas Foundation.

Rosalinda Sanquiche, MA, Executive Director, Ethical Markets Media.

Katie Teague, MA Counseling Psychology, founder Storm Cloud Media LLC, director/producer Money & Life.

Stuart Valentine, MBA, President, Iowa Progressive Asset Management.

### *Signatories*

Rebecca Adamson, Founder and President First Peoples Worldwide, USA.

Michel Bauwens, P2P Foundation, Thailand.

Lawrence Bloom, Executive Chairman, Bhairavi Energy; Chairman, Connolly & Callaghan, London.

Rinaldo Brutoco, JD, Founding President, World Business Academy, USA.

Christina Carvalho Pinto, President, Full Jazz Communications Group; and Mercado Ético/ Ethical Markets Brazil.

Sam Daley-Harris, Founder, RESULTS the and Microcredit Summit Campaign, USA.

Sami S. David, MD, Director, Fifth Avenue Fertility.

Susan Davis, President, Capital Missions Company, USA and Ecuador.

Ladislau Dowbor, Prof of Economics, Catholic University of São Paulo, Brazil.

Riane Eisler, author of The Real Wealth of Nations, President, Center for Partnership Studies.

Prof. Orio Giarini, Director, The Risk Institute, Geneva - Trieste, EU.

Gijs Graafland, Director, Planck Foundation (research institute for energy politics and energy finance), Amsterdam, Netherlands.

Ashok Khosla, Chairman, Development Alternatives, Delhi, India.

Ross Jackson, co-founder, Gaia Trust, Copenhagen, Denmark.

David Loye, author, Bankrolling Evolution, Measuring Evolution, co-founder, General Evolution Research Group and The Darwin Project.

Paul E. Metz, PhD, co-founder European Business Council for Sustainable Energy; speaker of Dutch Alliance for a Fair & Green Deal, Brussels, Belgium.

Terry Mollner, Co-Founder, Calvert Social Investment Funds and Foundation; Chair, Stakeholders Capital, Inc.; Member of Board of Ben & Jerry's. USA.

Robert A. G. Monks, Founder, ISS, The Corporate Library, the Lens Fund, a founding trustee of the Federal Employees Retirement System, author of Corpocracy and other books, USA.

Ron Nahser MBA, PhD, Institute for Business and Professional Ethics, DePaul University, USA.

Ann Pettifor, Fellow of the new economics foundation, and co-founder of the PRIME network of economists, UK.

Simon Rich, Educator (Duke University), Investor, Farmer, former CEO.

Elisabet Sahtouris, author, A Walk Through Time: From Stardust to Us; consultant on ecological finance.

Robert W. Shaw, Jr., President, Areté Corporation, USA.

Rena Shulsky David, Founder, Green Seal; CEO Shire Realty, USA.

Richard Spencer, Head of Sustainability, Technical Strategy Department, Institute of Chartered Accountants in England and Wales - ICAEW, UK.

Tessa Tennant, Co-Founder, Association for Sustainable & Responsible Investment in Asia, ASrIA, UK and Hong Kong.

Shann Turnbull, PhD, Principal: International Institute for Self-governance; Founding life member and Fellow, Australian Institute of Company Directors

Allen White, Senior Vice President, Tellus institute, Boston.

Eva Willmann de Donlea, MBA, Director, Sustainability Intelligence Pty Ltd, Australia.



# **The World Academy of Art and Science: History and Manifesto**

[www.worldacademy.org](http://www.worldacademy.org)

## **1. History**

The idea of founding an international association for exploring major concerns of humanity in a nongovernmental context grew out of many conversations that took place among leading scientists and intellectuals in the years following World War II. Prominent among this group were people such as Albert Einstein and Robert Oppenheimer who had played a part in the development of the atomic bomb and were deeply concerned about how it and other scientific advances might be used — or misused.

This informal project took a major step forward in 1956, when a meeting — The First International Conference on Science and Human Welfare — was held in Washington, D. C. The organizers were two American scientists: Richard Montgomery Field of Princeton, who had worked for many years as chairman of an international committee on the social values of science; and John A. Fleming, former President of the International Council of Scientific Unions. At the end of the conference, participants agreed to take steps toward the formation of a World Academy, and elected an International Preparatory Committee for that purpose. Its members were: (from France) Pierre Chouard, George Laclavère and G. Le Lionnaise; (from the United Kingdom) Ritchie Calder, H. Munro Fox and Joseph Needham; and (from the United States) Robert Oppenheimer.

The Academy was formally founded (and its first officers elected) in 1960. They were: as President, Lord John Boyd Orr of Scotland; as Vice Presidents, Hermann Joseph Muller of the United States and Hugo Ostvald of Sweden; and, as Secretary General, Hugo Boyko of Israel. They published the following statement:

## **2. Manifesto, in the Name of Science and the Future of Mankind**

The appeal of the International Conference on Science and Human Welfare has been realized — THE WORLD ACADEMY OF ART AND SCIENCE has been established.

This urgently needed forum has been created for distinguished scientists and scholars to discuss the vital problems of mankind, independent of political boundaries or limits — whether spiritual or physical; a forum where these problems will be discussed objectively, scientifically, globally and free from vested interested or regional attachments.

The basic idea which led to the founding of the Academy stems from the following considerations:

- All existing international organizations which decide on vital problems of mankind are constructed on the principle of national or group representation.
- This forum is international, or more truly trans-national.
- From the dawn of mankind people have worked together to build the tower of knowledge,

and no nation has failed to contribute to this marvelous building. The creative power of the human spirit is to be found in the first prehistoric digging stick for agriculture as in the motorized plough of our time. The first canoe is no less original in concept than the Archimedian principle; the first wheel no less than the first airplane — perhaps even more so.

- The true object of all these achievements of the human spirit is to lighten the burden of life, to enrich it — and certainly not to make it more difficult or to destroy it. In the words of Einstein, who is one of the spiritual fathers of this transnational forum: “The creations of our mind shall be a blessing and not a curse to mankind.”

This is the fundamental aim of the World Academy: to rediscover the language of mutual understanding. It will work in close collaboration with the institutions of the United Nations. It will look for the true enemies of peace, and try to fight them:

These enemies are hunger and sickness, waste and destruction; the archenemies intolerance and ignorance, resignation and fear.

In international meetings and conferences, represented by group or nation, the intrinsic merits of the questions discussed have too often to be subordinated to considerations of national prestige or group interests. The World Academy has no pre-established tasks to fulfill and no vested interests to serve. It is free to attack problems in the broad interests of mankind, and to seek solutions leading to hope, happiness and peace.

With the help of science and the support of all cultural and constructive forces of mankind, the World Academy will be able to dedicate itself to its objective — the aim of serving as an impartial and nonpolitical adviser, complementing other organizations, in this difficult transition period, and contributing in leading mankind to an era of true progress, true human welfare, and true happiness.

Supported by the confidence and trust of a great number of spiritual leaders of mankind, we herewith declare the World Academy of Art and Science founded.

*For the Charter Members - December 24, 1960*

The list of Charter Members contained the names of four Nobel Laureates (Lord Boyd Orr, Prof. Muller, Lord Russell, and Prof. Urey) as well as those of several men who had played leading roles in shaping the major postwar international organizations: Prof. Needham had been a co-founder of UNESCO, Lord Boyd Orr the first Director General of the Food and Agriculture Organization (FAO), and Dr. Chisholm the first Director General of the World Health Organization (WHO).

Also mentioned were the names of four “Posthumous Charter Members” — Albert Einstein, John A. Fleming, Sir Ian Clunies Ross and Homer Le Roy Schantz — who had died before they could sign the founding manifesto.

*Past Presidents:*

*Lord John Boyd Orr - Hugo Boyko - Stuart Mudd - Detlev Bronk - Harold Lasswell - Walter Isard  
Ronald St. John Macdonald - Carl-Göran Hedén - Harlan Cleveland - Walter Truett Anderson*

## EDITOR



### THE RISK INSTITUTE

On the basis of a voluntary network, partly supported by The Geneva Association, The Risk Institute was established in order to extend the studies on the issues of risk, vulnerability and uncertainties to the broader cultural, economic, social and political levels of modern society. It is now in the process of becoming established as a Foundation.

The starting point defining the programme of action was an informal meeting held in Paris in 1986. Among the participants were Raymond Barre, Fabio Padoa, Richard Piani, Edward Polman, Alvin and Heidi Toffler and Orio Giarini.

A first report, by Orio Giarini and Walter Stahel, was published in 1989, reprinted in 1991 and revised in 1993, with the title *The Limits to Certainty – Managing Risks in the Modern Service Economy* (Kluwer Academic Publishers, Dordrecht, The Netherlands), with an introduction by Nobel Laureate Ilya Prigogine. It was also published in French, Italian, Romanian and Japanese. A completely new German version was published in 2000 with the title *Die Performance Gesellschaft* (Metropolis-Verlag, Marburg).

The book stresses the point that uncertainty is not just simply the result of inadequate or insufficient information. Every action extending into the future is by definition uncertain to varying degrees. Every ‘perfect system’ (or ideology) is a utopia, often a dangerous one: the total elimination of uncertainty in human societies implies the elimination of freedom. Learning and life are about the ability and capacity to cope, manage, face, contain and take advantage of risk and uncertainty.

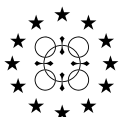
In 2002, The Risk Institute published with Economica (Paris) the book *Itinéraire vers la retraite à 80 ans*. Ever since the The Risk Institute has been mainly concerned with a research programme on social and economic issues deriving from extending human life expectancy (usually and wrongly defined as the ‘ageing’ society), which is considered the most relevant social phenomenon of our times. This is particularly relevant in the context of the new service economy. The Risk Institute has contributed to the organisation of the conference on “Health, Ageing and Work” held in Trieste and Duino on 21-23 October 2004. Followed by a second conference on similar issues, in Turin, October 2007. On this basis, it has taken the initiative to publish from 2005 the EUROPEAN PAPERS ON THE THE NEW WELFARE – The Counter-Ageing Society, in two versions (one in English and one in Italian), both freely available on [www.newwelfare.org](http://www.newwelfare.org).

In 2010 the Institute has published in Italian “*Itinerario senza frontiere: dal Texas alla terza età*”. Further more it is now editing the CADMUS Papers.

*Director: Orio Giarini*

*orio.giarini@alice.it  
giarini.orio@gmail.com  
via della Torretta, 10  
34121 Trieste - Italy  
[www.newwelfare.org](http://www.newwelfare.org)*

*risk\_institute@genevaassociation.org  
route de Malagnou, 53  
1208 Geneva - Switzerland  
Tel. +41 (0) 22 7076600  
Fax +41(0) 22 7367536*



**EUROPEAN PAPERS  
ON THE NEW WELFARE**  
*the counter-ageing society*

**No. 15, October 2010**

ISSN 19708947

Available on the website of the  
EUROPEAN PAPERS ON THE NEW WELFARE  
THE COUNTER-AGEING SOCIETY

**[www.newwelfare.org](http://www.newwelfare.org)**

ISSN 1972-4543

*all issues and articles published,  
are fully and freely available*

**In addition, you can find in the site (english version) under:**

**VIDEO**

- *Introduction to "The Limits to Certainty" - a report to the Club of Rome, Kluwer Academic Publishers Dordrecht - International Studies in the Service Economy*  
*This report is also available in French, German, Italian, Rumanian, Spanish, Japanese*

**DOCUMENTS**

- *"The Employment Dilemma and the Future of Work", a report to the Club of Rome*  
*(also available in German - 2 editions -, French, Spanish - 2 editions -, Italian, Korean, Bulgarian)*
- *"Notes on the Service Economy: the Context for the New Welfare", a discussion paper*
- *Abstracts from "THE LIMITS TO CERTAINTY - Facing Risks in the New Service Economy"*  
*(2nd edition, Kluwer Academic Publishers, Dordrecht / Boston, 1993)*
- *Abstract from "DIALOGUE ON WEALTH AND WELFARE" (Pergamon Press, Oxford, 1980)*

***For your library the printed version:***

***Information***

The Risk Institute - Istituto del Rischio

Via della Torretta, 10 - 34121 Trieste - Italy

53 route de Florissant - 1208 Geneva - Switzerland

# **The Employment Dilemma and the Future of Work**

## ***Report to the Club of Rome***

**By Orio Giarini & Patrick M. Liedtke**

Second edition • 151 pages • CHF 60

---

Modern societies are trying to develop concepts that allow them to protect their citizens and at the same time stay competitive in the globalised markets. The approach of the new welfare state is no longer to arrange for full coverage of (ideally) all risks but to replace the existing extraordinarily expensive systems with more targeted and efficient approaches. This is achieved through requiring people to assume more risks individually and to organise their adequate protection themselves. This so-called “risk shift from public to private”, unfortunately, has had as a consequence many half-hearted or partial reforms leading to ineffective working structures, inadequate employment arrangements, and ultimately an erosion of the protective systems rather than their real modernization.

In this report, the authors analyse work in all its forms in the modern service economy and propose several innovative solutions. Two of the most ambitious are: (1) Organising a basic layer of remunerated work for those who otherwise cannot find employment, keeping them active and engaged; and (2) the encouragement and empowerment of the elderly to stay in employment for many years beyond age 60 or 65 — not just as a simple prolongation of existing careers but at flexible terms (part-time work is the key component) that are more suitable to them.

### *About the Authors*

Orio Giarini is Director of the Risk Institute in Geneva and Trieste, a European research institution for the new welfare society, and Editor-in-Chief of *The European Papers on the New Welfare*. He was formerly Secretary General of “The Geneva Association”, Member of the Executive Board of the Club of Rome and professor at the University of Geneva, lecturing on the new service economy.

Patrick M. Liedtke is Secretary General and Managing Director of “The Geneva Association”, leading risk and insurance research organisation supported by the CEOs of the largest insurance companies in the world. He was Member of the Executive Board of the Club of Rome, Director of ASEC (Applied Services Economic Centre), Board Member of the European Group of Risk and Insurance Economists (EGRIE), and Editor-in-Chief of *The Geneva Papers on Risk and Insurance — Issues and Practice*.

---

*To order copies of the book, please contact:*

**The Geneva Association - General Secretariat**

53, route de Malagnou - CH-1208 Geneva - Tel.: +41-22-7076600 - Fax: +41-22-7367536  
secretariat@genevaassociation.org - [www.genevaassociation.org](http://www.genevaassociation.org)



**INTERNATIONAL UNIVERSITY INSTITUTE FOR EUROPEAN STUDIES  
I.U.I.E.S.**

34170 Gorizia (Italy) - Via Mazzini, 13 Tel. ++0039.0481.533632 Fax ++39.0481.532094  
e-mail: iuiies@isig.it - web: www.interuniv.isig.it

The International University Institute for European Studies (IUIES) was founded in 2000 and is an international university consortium of the universities of Trieste, Udine, Klagenfurt, Eötvös Loránd of Budapest, Babes-Bolyai of Cluj-Napoca (Romania), Comenius of Bratislava, Jagiellonian of Kraków, MGIMO of Moscow, Nova Gorica University and the Institute of International Sociology of Gorizia (Italy).

Every academic year the Consortium organises three postgraduate programmes: 'PhD Transborder Policies for the Daily Life' (180 credits), 'MA Communication Methods in European Policy Making' (120 credits), 'MA International Peace Operators' (120 credits) offering a variety of courses led by international Professors, scholars and experts from various European Union DGs and international NGOs.

*PhD description*

***PhD IN TRANSBORDER POLICIES FOR THE DAILY LIFE***

The programme encompasses theoretical and methodological questions in the study of regionalism and regional development, explores the key current debates such as the interface of the political, economic and cultural EU development, by focusing on regional/urban changes and cross-border policies. The programme is thus oriented towards the development of regions and their relationship within the EU as well as the development of the border regions of prospective Central and East-European countries. It has been designed to attract scholars and students committed to elaborating interdisciplinary theoretical and methodological approaches to the study of economic and social development and changes in border regions.

The **PhD IN TRANSBORDER POLICIES** includes a course on:  
**Welfare State Policies**, by Orio Giarini

*Course description:*

The management and perspectives of the welfare system in the industrialized countries, with reference to:

- the lengthening of the life cycle;
- employment and productive activities;
- retirement systems: pay-as-you-go (redistribution), capitalization, personal individual savings and provisions. Fiscal strategies and the negative income tax;
- health and ageing.

*Topics:*

1. The economic background: from the industrial revolution to the service economy.
2. Vulnerability and Risk Management. The role of technology.
3. Macro-economic factors and demographic developments.
4. The strategy of the four pillars in social security. Health management.
5. The counter-ageing society.
6. The employment dilemma: work and economic value.
7. Service functions and productive activities.
8. The intergenerational contract.
9. European policies and the lengthening of the life cycle.
10. Global issues and perspectives.

## ***CADMUS: The Personality of a Journal***

by **T. Natarajan**, President, The Mother's Service Society, Pondicherry, India

*At great moments, great movements arise. Life makes history memorable by its revelation at such moments. Military movements were led by generals, political movements by great personalities. After the war, leadership of such movements was offering itself to great international organizations. Initially the UN responded to the mature moment. The world has been waiting for one organization or a group of them to accept such a leadership. It is a leadership of thought. Several organizations sprung up and played active roles. They often go into dormancy, while their original ideas organize themselves more solidly below the surface of life. When they resurface, they emerge with a greater effectivity and a compelling force for effectuation. They usually do so at the time of great anniversaries.*

*The world needs political direction with a realistic economic content to organize itself as a global eminence. Democratic liberties become real to the society when they are based on economic equality. Seminal ideas about service economy and unmonetized economic activity broaden the base of economic science, so that it may play a more energetic role in the affairs of the world. The spirit of the times recognizing the value of great ideas and the significance of the evolutionary movement seeks a forum for expression. As organizations followed outstanding leaders in the post war period, journals offer themselves as vehicles of leadership.*

*It is their personality. Britain, which went in search of trade, was offered an empire in the 18th century. America, which was isolationist, in the 20th century was offered world leadership, as she had that immense capacity for production. Trade alone was the creator of great wealth in the 18th century. Hence empire came to Britain.*

*The essence of today's world leadership appears to be economic but, in truth, it requires political maturity to express it. Political inspiration that underlies economic realities qualifies for leadership in today's world. Such a leader may, in time, offer helpful ideas to the world that is beset with problems. Great ideas are preceded sometimes by great crises, as if they are seeking redress. The 50th anniversary of an international organization is a ripe moment for its founding ideas to reemerge with greater vigour and a self-effectuating capacity. A journal with a personality can carry out that mission successfully.*

---

## SEED

---

### *South-East European Division of The World Academy of Art and Science*

---

The Board of Trustees of the World Academy of Art and Science (WAAS) established its South-East European Division (SEED-WAAS) in 2005. SEED-WAAS includes fellows, associate and junior fellows of WAAS from South European countries, i.e. from Portugal and Spain to Greece and Turkey. Since 2005 membership of SEED-WAAS has more than tripled. SEED-WAAS is a member of the Central-Eastern European Network of national academies and of the ALLEA - association of all European academies. SEED-WAAS cooperates with The Club of Rome and national associations of the Club, with the Pugwash Movements and its national associations, and with The Balkan Political Club. Many fellows of SEED-WAAS are also members of these organizations.

Together with its partners SEED-WAAS has organized numerous international conferences, sessions during international conferences and meetings, including events at Barcelona (2010), Ljubljana (2008), Zagreb (2006, 2007, 2008 and 2009), Banja Luka (2006, 2010), Sarajevo (2006), Dubrovnik (2009), Podgorica (2009) and Istanbul (2006 and 2009). Proceedings of some of these conferences are published and distributed to Fellows of WAAS and to participants. One remarkable achievement worthy of specific mention was the initiative by Orio Giarini, Fellow of SEED-WAAS and Member of The Club of Rome, who initiated and now for more than five years successfully directs the journal "The European Papers on New Welfare - The Counter-aging Society". That journal served as a foundation and inspiration for the launching of CADMUS.

SEED-WAAS members are actively engaged and have initiated several recent and on-going programmes of the World Academy, notably the Initiative for Abolition of Nuclear Weapons, Global Employment Challenge, The Evolution of Individuality, From Crisis to Prosperity and Limits to Rationality. Other notable SEED activities include: a bilingual English-Croatian website [www.vrijemeje.com](http://www.vrijemeje.com) (it is time!) publishing articles on economic and related issues by SEED-WAAS fellows and serving as a platform for interaction with the public; formulation of long-term energy strategy; proposals to raise employment in the region; and a proposal to declare SE Europe as a nuclear weapons free zone with guarantees for peace and security under the umbrella of NATO.

*Ivo Šlaus, President*

---