GHETTO'ING THIRD WORLD WORKERS WITH HI-TECH : INDUSTRIAL APPLICATION OF ARTIFICIAL INTELLIGENCE AND ITS EFFECT ON FOREIGN DIRECT INVESTMENT IN THE THIRD WORLD -- EXPLORING REGULATORY SOLUTIONS THROUGH AN EMBLEMATIC CASE FOR THE NEW ECONOMY

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VII. CONCLUSION

" Entre le fort et le faible, c'est la liberte qui opprime et la loi qui affranchit."

Translation: *"Between the powerful and the weak, it is liberty that oppresses and the law that sets free."*

Père Henri Lacordaire (1802-1861)[2]

I.
INTRODUCTION

In early 2007, MSNBC science editor Alan Boyle wrote an article about human-robot interaction as life for the future. Reporting on the work of scientists such as robot specialist Cynthia Breazeal from MIT, Boyle pointed out that it will be just a matter of time before various technologies will go into sophisticated, "thoughtful" robots that can serve as "*artificially intelligent advice givers, assistants, and companions*" for humans. According to Boyle, scientists say computers will match the capability of the human brain by the year 2029, leading to a "*socio-technological singularity that cannot be anticipated…Someday you could be taking orders from a robot…but in a nice way,…*"[3][4]

Boyle has articulated the optimistic vision that occasionally appears in the media about possibilities offered by artificial intelligence (AI), which, in simplistic terms, can be defined as the science and technology that enable the simulation of the human brain's functions by a computer and, therefore, allow machinery and software to replace humans. For example, the robotic technology described in the Boyle article is only one application of AI,[5] and the navigator in today's modern cars is a form of such robotic technology.

But AI is not a new concept -- AI methods were used by governments

2. Father Henri Lacordaire was a French Dominican priest, a liberal Catholic who was elected to the French Parliament in 1848. He was successor to Alexis de Tocqueville in the French Academy (L'Academie Francaise).

3. Alan Boyle, "Robots will soon be calling the shots," http://www.msnbc.msn.com/id/17244922/ (Feb. 21, 2007).

4. Id.

5. Dreyfus, Hubert, What Computers Can't Do: The Limits of Artificial Intelligence (Harper & Row 1979); Osherson, Daniel, An Invitation to Cognitive Science, A Bradford Book, 1998; Searle, Ronald, "Minds, Brains, and Programs,'' in The philosophy of AI, Oxford University Press, 1990; Pratt, Vernon, Machines à Penser : Une Histoire de L'intelligence Artificielle (PUF 1995).

during past world wars (then called "Operational Research").[6] Since then, AI has been developed and used by government organizations such as NASA,[7] and has enabled systematic, massive automation of factory labor, leading to mass commodity production.[8]The advent of technology has boosted the development of AI, raising concerns as to what may happen to our society if eventually robots will replace humans.[9]

It is clear that AI has changed consumer behaviors, improved quality of life, and transformed our way of thinking and solving problems. More specifically, AI has been applied to render services such as: decision-making assistance, diagnostic services (specially in health and medicine), interpretation of signals, voice recognition, image interpretation, machine adjustment, assistance in industrial process and learning process, computer vision, game playing,[10] or other futuristic robotic assistance described by Alan Boyd. Depending on research, the potential of AI can go much further than these applications, including a complete lifestyle revolution.[11] AI is recognized as a motivational force in the "New Economy"[12] (at times referred to as the "Knowledge

6. The most famous example is the work of Tjalling Koopmans in the U.S. and Kantorovitch in the Soviet Union, applied respectively for the transportation of U.S. troops in the Pacific and of Soviet base metals in Siberia during World War II. Both scientists received Nobel Prizes in economics. See also Koopmans: Optimum Utilization of the Transportation System (Econometrica N°17, 1949) and Kantorovitch: On the Translocation of Masses (Management Science N°5, 1958); Blay Whitby, A Beginner's Guide to Artificial Intelligence (One World Oxford 2003) at 12 (recounting the work of Alan Turing on "Enigma," used to break German military codes during World War II); Lee Loevinger, Reflections on Computer Technology & The Law: The Invention and Future of the Computer, 15 J. Marshall J. Computer & Info. L. 21 (Fall 1996).

7. Whitby, *supra* at 19 *et al.*

8. Lewis D. Soloman, The Microelectronics Revolution, Job Displacement, And The Future Of Work, 63 Chi.-Kent. L. Rev. 65, 83-84 (1987).

9. Lee Gutkind, Robo-Nation: 12 Questions About the Future of Robotics, *found at* http://www.theamericanscholar.org/su07/roboticsquestions-gutkind.html. *Accord* Alan Boyle, "Robots will soon be calling the shots," http://www.msnbc.msn.com/id/17244922/ (Feb. 21, 2007). Concerns expressed by members of the public via the internet have included the following:
"This is creepy… I hope that the individuals creating these androids don't make any mistake now…I find myself in an abusive relationship with my robot…"
"I am not so much worried about the robots malfunctioning and "taking over" as I am with the corruption of corporations…simply because the people making the robots cannot be trusted…[H]ow much of your freedom and privacy do you want to give up to have a robot…[who] is collecting information on you…? No androids for me thank you…" See
http://boards.msn.com?MSNBCboards/threatd.aspex?BoardID=475&ThreadID=207576. *Accord* Pamela McCorduck, Machines Who Think (A.K. Peters NA 2004) at 353, 381 (raising issues such as « forging the God » and whether « a made-up mind [can] be moral »).

10. In 1997, Gary Kasparov, chess world champion, was defeated by a computer program called Deep Blue, or Chess Genius 2.9. Whitby, *supra* at 4.

11. According to writers, Hollywood can now allow Humphrey Bogart and Marilyn Monroe (the computer-based reconstruction of them) to make movies again. Likewise, it is conceivable that the feasibility of "virtual girlfriends" and "artificial companions" will bring AI to the pornographic industry. Whitby, *supra,* at 128-29.

12. The concept of the "*New Economy*" was raised in the U.S. around 1997. The New Economy introduced the sector of "the new Technologies of Information and Communication" (TIC) and the economic growth that this new sector induced. The concept also reflected a new approach to the economy based on knowledge

Economy"[13]). The question remains whether AI is also responsible for a new division of labor, globally, leading to a new distribution of wealth and power that can further disadvantage the existing disadvantaged.

This Article examines the potential impact that systematic and large-scaled industrial application of AI may produce on foreign direct investment (FDI)[14] in the new century. The Article suggests that as higher forms of AI will increase the productivity of the economy, it can also potentially reverse existing global FDI patterns. Although such reversal of trend may appear positive on the surface,[15] it can indeed also inflict further harm on Third World nations, widen the gap between the have's and have-not's, and ultimately bring about a new global division of labor that can ghetto the disadvantaged. This gloomy vision fits in with what critics have envisioned about the adverse effect of globalization – *an ongoing, heated international law and economic debate.*

As conclusion, this Article points out, *inter alia*, the need for systematic, coordinated transnational regulation. This means an effectively enforced international economic law system that transcends cultural and territorial borders for the protection of all constituents: intellectual property right (IPR) holders, technology producers, and the global workforce. The Article proposes that the regulatory scheme should aim

and creativity (rather than the old approach based on raw natural resources and commodities). *See* Robert J. Gordon, *Does the New Economy Measure Up to the Great Innovations of the Past?* 14 J. Econ. Perspectives 49 (2000); OECD: "The new economy beyond the hyde" **2001**; Daniel Cohen & Michele Debonneuil, «La nouvelle economie,» La Documentation Francaise (1998)]; Jorgernson & Stiroh, «Raising the speed limit: US economic growth in the Information Age,» Mimeo. Harvard University (2000); U.S. Dep't of Commerce, Digital Economy 2000 (2000). *See also* Roger Alcaly, The New Economy (NY Farrar Strauss and Giroux 2003); Jean Gardrey, New Economy, New Myth (Routledge 2003).

13. I propose that "Knowledge" consists of four types: (I) pure knowledge of technology and related methodologies, such as computer software and hardware; (II) know-hows, referring to knowledge arising from culture, context, utilization, employment, or tasks, which enables the application of Type I knowledge (*see* note 191, *infra*) (definition of Know-How); (III) factual data and information such as that which may be contained in a database or an encyclopedia; and (IV) relational knowledge, which helps us locate the sources of information or expertise. *See* discussion in Part VI. A, *infra.*

14. "Foreign Direct Investment" is defined as an investment involving a long-term relationship between, and reflecting a lasting interest and control by, a resident entity in one economy (foreign direct investor or parent enterprise) and an enterprise resident in an economy other than that of the foreign direct investor. The term FDI implies that the investor exerts a significant degree of influence on the management of the enterprise resident in the other economy. Such investment involves both the initial transactions between them and among foreign affiliates, both incorporated and unincorporated. FDI has three components: equity capital, reinvested earnings and intra-company financing. World Investment Report 2006 *supra* note 30.

15. Globalization can lead to nations competing with each other in lowering labor standards in order to attract FDI, resulting in non-standard work, a decline in the power of trade unions, and other social ills such as the exploitation of migrant workers, child labor, and the feminization of the workforce at substandard conditions, all detrimental to worker welfare. Katherine Van Wezel Stone, *To the Yukon and Beyond: Local Laborers in a Global Labor Market*, 3 J.SMALL & EMERGING BUS. L. 93, 96 (1999); Blanpain, Bisom-Rapp, Corbett, Josephs, & Zimmer, The Global Workplace at 11-12 (2007). Now, if AI can replace human labor, one can easily conclude that all the above problems may disappear. As argued in this Article, this may not be the case.

to highlight "Knowledge" as an endogenous production factor in the New Economy, with the view to protect workers and to close the gap in access to "Knowledge" between the ruling elites and the workforce, which would serve to disenfranchise the later. Efforts at regulation will require, on the part of global law- and policymakers, a comprehensive review of, as well as coordinated amendment and better specification to, the existing international legal framework in all relevant areas of the law: intellectual property, antitrust, labor, trade/export-import, e-commerce, cross-border data flow and internet usage.

Because such coordinated global regulation will take time and may not be feasible due to obstacles and challenges deeply rooted in the current legal and political systems, as a real-life solution, the Article urges the developing nations to formulate and implement policies that immediately place workforce education, technology independence, freedom of ideas and innovation as the highest priorities in meeting and joining the New Economy. Sadly, in many cases, this cannot be brought about without grass-root political reform in many countries of the Third World. (I use the term "Third World" for convenience only, while fully aware of its biased cultural annotation. Accordingly, I ask for readers' tolerance with my use of this term.)[16]

II.
BACKGROUND AND CONTEXT: UNDERSTANDING AI AND ITS RELATIONSHIP TO FDI

What is AI?

● *Historical Background.* The desire to create an "artificial human" can date

16. For convenience, the term ""*Third World*"" refers collectively to the newly industrialized economies, the transitional economies, the developing economies, the lesser-developed economies, and the least developed economies. Terminologies such as "developing country" and "least-developed country" have been used in the GATT-WTO framework to grant exemptions, preferences, or transitional grace periods to nations that need economic help in order to achieve parity with the developed nations of Asia-Pacific, North America and Western Europe. *See, e.g.,* Agreement on Trade-Related Investment Measures (TRIMS). In this Article, "Third World" simply refers to any and all countries that do not belong to the developed Asia (i.e. Japan), Western Europe or the developed North America. Western Europe and North America exemplify Anglo-American Common Law and Civil Law traditions. *Accord* Wendy Duong, Partnerships with Monarchs – Two Case Studies: Case One: Partnerships with Monarchs in the Search for Oil: Unveiling and Re-Examining the patterns of "Third World" Economic Development in the Petroleum Sector," 25 U.Penn.J.Int.Econ.L. No. 4 1171, n. 12 (Winter 2004). The term "developing" as used in this Article encompasses the earlier stages of economic development that a country or region undergoes, all the way to the newly industrialized stage of development. Accordingly, for purposes of this Article, the term "Third World" and "developing" nation, country, economy, or region are used interchangeably.

back to Homer's Iliad, when the God Hephaestus created "golden wives" who had the capacity to speak and work.[17] Concretely, Blaise Pascal, the genius French scientist–philosopher, created a calculator in 1642, *The Pacaline,* the first machine capable of accomplishing what was once considered the domain of the human mind.[18]

To understand the concept in context, let's now look at one application of AI: robot technology. Industrials robots first appeared in factories a long time ago, during the earlier part of industrialization. Since then, there have been three generations of robots. A robot of the first generation is able to execute a set of pre-established movements. A second-generation robot is endowed with visual perception, which enables it to make some decisions. Robots of the third generation, subject of current research, are like those discussed in the Alan Boyle article – capable of becoming humans' personal assistants and companions. They should have a more complex autonomy equipping them with the ability to move in an unknown environment.[19]

Since the 1970s, the development of AI has been extraordinary, thanks to the tremendous increase in capacity of the computer. Starting in the 1980's, AI broke into the commercial world and the field of Informational Technology (IT), and became the meeting point of biologists, scientists, mathematicians, statisticians, computer scientists, sociologists, psychologists, economists, and last but not least, lawyers. [20]

Definitional Framework. The phrase "AI" was proposed for the first time by John MacCarthy at Darmouth College in 1956: "*It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable.*"[21]

This definition is subject to debates.[22] What is meant by "intelligent

17. HOMER, *THE ILIAD*, A.T. Murray, translator (Harvard University Press [Loeb Classical Library], Cambridge 1967).

18. Pamela McCorduck, Machines Who Think, *supra* at 523-24. Lee Loevinger, Reflections On Computer Technology & The Law: The Invention And Future Of The Computer, 15 J. Marshall J. Computer & Info. L. 21, 22 (1996).

19. Pratt, Vernon, Machines à penser : une histoire de l'intelligence artificielle, PUF, 1995. Pamela McCorduck, Machines Who Think, *supra* at 523-24.

20. *See* http://library.thinkquest.org/2705/history.html (last visited Aug. 2, 2007); Blodgett, *Artificial Intelligence Comes of Age*, A.B.A. J., Jan. 1, 1987, at 68. *See also* McCorduck, *supra* at 526.

21. Pamela MCorduck, Machines Who Think at 111 (A.K.Peters, Ltd. MA 2004).

22. Not only is the definition of AI subject to debate, but the definition of "intelligence" itself is also questioned by researchers. Blay Whitby, A Beginner's Guide to Artificial Intelligence (One World Oxford 2003). Whitby, a professor of cognitive science and AI at the University of Sussex, England, suggests the following definition: *"[AI] is the study of intelligent behaviour (in humans, animals, machines) and the attempt to find ways in which*

machines?" One can consider mainly two responses:

1. A machine is considered intelligent if it reproduces human *behaviors* in a specific (or non-specific) environment;

2. A machine is considered intelligent if it modelizes the cognitive *functioning* of a human being.

These responses have led to two different approaches in the development of AI. The first approach is analogous to *behaviorism* in psychology – that only human behavior (i.e., stimuli-responses) may be a subject of scientific studies.[23] The second approach is based on "*cognitive science*,"[24] analogizing the human mind/brain to computer sofware/hardware. Today, the dichotomy between these two approaches is less and less relevant to researchers and scientists, as other paradigms have appeared, such as *connectionism* (simulated neuronal network)[25] or *adjustable algorithm* (genetic algorithm).[26] For the purpose of this Article, it is unnecessary to explore these paradigms fully -– the task should justifiably be left to scientific journals, and not law or legal interdisciplinary reviews.

For its purpose, this Article proposes the following simplified, concretized definition: AI is a science (and technology) that aims to create a machine, especially a computer, which can do jobs requiring the perceptive and cognitive functioning of a human being. To realise this objective, the science

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such behaviour could be engineered in any type of artifact." *Id.* at 1.

23. *See* Stanford Encyclopedia of Philosophy, http://plato.stanford.edu/entries/behaviorism/ (last visited Aug. 2, 2007).

24. Although there is much disagreement as to what *cognitive science* is, it can loosely be described as the interdisciplinary study of the mind (in humans, animals, and even machines or ET aliens). Whitby, *supra* at 98. According to Whitby, cognitive science was born out of opposition to behaviorism in psychology, and hence has had tremendous effect on the study of psychology, including the teaching and learning process. Just like AI, cognitive science brings together several types of experts: psychologists, neurobiologists, linguists, computer scientists, and philosophers.

The following summarizes the development of psychology as a field of study in an effort to explain the cognitive science. *Folk psychology* is the common sense and gathering of life experience that helps us understand and predict what people do. In the first half of the 20th century, the main scientific challenge to folk psychology was an approach to psychology called "*behaviorism*." This approach is premised on the notion that the only scientific way to explain human behavior is to analyze input/output – when people are subject to a "stimulus," they give a "response" such that the human brain is like a "black box," and scientific psychology is the recording and measuring of "stimuli-responses" pairing. Cognitive science was born as a challenge to behaviorism, and AI was crucial to that birth, because it brought about the understanding that even the computer is not exactly "a black box" in the behaviorist sense. For example, a robot can be programmed to have a "goal." Instead of sending a robot to the kitchen to get coffee, scientists can program the robot to have a "make-coffee goal." Whitby, *supra* at 98.

25. "Artificial neural nets" are a type of computer program directly inspired by knowledge of how the brains of humans and similar animals work, raising inquiries such as whether artificial neural nets are keys to intelligence. Whitby, *supra* at 42.

26. "Genetic algorithm" is one particular form of "evolutionary computing," defined briefly as a field of AI that takes the basic principles of evolution and applies them in the form of a computer program. *Id.* at 58-59.

of AI must formalize human knowledge and mechanize the process of human reasoning in various types of activities. The methods and techniques used in this science are varied and interdisciplinary, all beyond the scope of this Article or the expertise of this author.

Simply stated, AI is the simulation of the human brain by a computer.[27] Scientific methods are used to identify those superior functions of the brain that can be simulated. For example, researchers will analyze and document what an engineer must do to design a system for the factory production of a particular commodity. Then, mathematical models, often requiring *algorithm,*[28] are used to memorialize, express, and document these superior human brain functions. These mathematical models are then fed into a computer, such that when a standardized instruction or an inquiry is given, the computer will generate the desired result, exactly like the work product of the engineer. The software will then replace the engineer. At this point, AI will have been used in the system design of factory production in order to free the engineer for other tasks.[29] Basic machine intelligence results in the automation of repetitive tasks that require little thinking capacity, but higher forms of AI can truly simulate the human mind.

In other words, in the development of AI, experts study how humans think, work, perceive, and communicate in order to modelize those functions into mathematical formulas that can be fed and incorporated into a machine. Robotic intelligence is just one way in which some form of AI is used to service society.[30] At a more sophisticated level, there is the modelisation of the human brain and its varied thinking and cognitive functions. One of the most spectacular results is the "recognition of form" via vision intelligence, i.e., the

27. At least one writer has distinguished the invention of the computer from other inventions. Other inventions with popular usage are designed for utilitarian purposes whereas the computer is also designed for the specific purpose of advancing scientific research. AI is an example of this fact. Lee Loevinger, Reflections on Computer Technology & The Law: The Invention and Future of the Computer, 15 J. Marshall J. Computer & Info. L. 21 (Fall 1996).

28. A number of mathematicians (such as John Lucas and Roger Penrose) have opposed AI, reasoning that human thought cannot be algorithmic. These mathematicians do not feel that they are following an algorithm when they make creative leaps in their own mathematical work. *Id.* at 77. *Accord* Roger Penrose, The Emperor's New Mind: Concerning Computers, Minds, and the Laws of Physics 5-11 (Oxford Univ. Press 1989); Roger Penrose, Shadows of the Mind: A Search for the Missing Science of Consciousness 12-16 (Oxford Univ. Press 1994).

29. Edwina L. Rissland, Artificial Intelligence And Law: Stepping Stones To A Model Of Legal Reasoning, 99 Yale L.J. 1957, 1958-59 (1990).

30. *See, e.g.,* Seth Borenstein, "Robots with Humanity," (The Associated Press Nov. 24, 2006), *found at* http://www.msnbc.msn.com/id/15831851/page/2/print/1/displaymode/1098/; *Accord* Seth Borenstein, "Robots can be so lifelike they're scary" (The Associated Press, Nov. 24, 2006), *found at* http://www.msnbc.msn.com/id/15831863/page/2/print/1/displaymode/1098/;

capture of visual information by an artificial retina.[31]

But one thing remains, or at least I believe and hope that readers will agree: no matter how sophisticated, AI cannot, and should not, replace human aesthetic and moral expressions and choices, or human decisions that require emotions, passion, imagination, the judgmental process of weighing consequences, or the human wisdom of predicting the future with nuances. For example, can or should AI compete with Homer or Shakespeare, or replace the White House in a decision on whether, or where, to drop a bomb? [32]

III.
ONE PAST AND PRESENT FDI PATTERN – FROM RICH TO POOR

Outbound flow of FDI from Rich to Poor. For several decades, the developing nations have become manufacturing sites for the transnational commodity producers who desire cheaper labor and raw natural resources. This has accounted for the volume of outbound FDI from the developed nations to the "Third World," well-demonstrated by the mere fact that China has been described as the "workshop of the world."[33]

Recent data released by the United Nations Conference on Trade and Development (UNCTAD) reinforce the pattern: U.S.-based transnational corporations dominate the flow of outbound FDI globally, both in financial services and in manufacturing.[34] For example, General Electric leads the list of the top 50 financial and non-financial transnational corporations based on the value of its foreign assets, as well as the number of its foreign affiliates and employees.[35] The data confirm the obvious: big American businesses

31. Pamela McCorduck, Machine Who Think, 279-301 (A K Peters, Ltd. 2004); VisRecog Visual Recognition Module, *found at* http://mind.sourceforge.net/visrecog.html (last visited Jun. 26, 2007).

32. Alan Turing, one of the greatest AI pioneers of the 20th century, raised nine objections to AI possibilities, including, among others, theological objection and mathematical objection. *See* The Essential Turing: Seminal Writings in Computing, Logic, Philosophy, Artificial Intelligence, and Artificial Life plus the Secrets of Enigma. (B. Jack Copeland, ed., 2004); *accord* Lee Loevinger, Reflections on Computer Technology & The Law: The Invention and Future of the Computer, 15 J. Marshall J. Computer & Info. L. 21 (Fall 1996).

33. John H. Matheson, Convergence, Culture And Contract Law In China, 15 Minn. J. Int'l L. 329, 332. (2006). *Accord* CNNmoney.com, "Beyond the Sweatshop: Can China Innovate?" (March 19, 2007); *compare* Business Week, International Readers Report, "China: Cheap Labor and Foreign Investment Aren't Enough" (November 18, 2002).

34. World Investment Report 2006 (UNCTAD Division of Investment, Technology and Enterprise Development).

35. United Nations Conference on Trade and Development, World Investment Report 2006, Presence in the Top 50 Financial TNCs Ranked by Spread Index, 2004, annex table A.I.14, UNCTAD/WIR/2006, available

bring their capital and technology abroad, especially to poorer countries in order to make money. These entities are also most financially capable and technologically equipped to research and develop industrial applications of AI.

The Information-Based Society, Added Value, and the New Economy. In the broader analysis, the development of AI is just one aspect of an information-based civilization,[36] where the computer becomes an essential tool of life. We are living in an era where, as the cliché goes, information or knowledge is power,[37] and the computer becomes a necessary tool to acquire information.[38] In the New Economy, economic theory has formally incorporated technology as one engine of economic growth, and knowledge is regarded as a factor of production just like capital and labor.[39] Take an example, the computer chip. This chip can be made of *Silicium,* the scientific name for a piece of 'sand' -- a material that is common and worthless. What gives the chip its value is the information and technology that the chip contains (mainly printed circuits and integrated circuits). With the information imbedded in it, the piece of Silicium is no longer worthless. The piece of Silicium now has "added value."[40]

In the New Economy, businesses compete to come out ahead, not in lowering production costs, but in innovation. The real market competition

at http://www.unctad.org/en/docs/wir2006annexes_en.pdf (last visited Jul. 9, 2007) [hereinafter World Investment Report 2006].

36. *See* Bill Gates, The Road Ahead (Viking Penguin, New York 1995).

37. *See* Note 12, *supra* (definition of "Knowledge" in context of the "Knowledge Economy").

38. **The digital computer is the main tool used in AI research. Whitby,** *supra*, at 7. Researchers and experts have questioned whether knowledge is the key to intelligence, and whether research efforts should go into finding ways in which the computer can learn for itself. *Id.* at 33-35

39. **Carlos Correa, Prospects and New Dimensions of International Transfer of Technology: An Issue Paper,** in the Law and Business of Licensing, at 2633, ed. Jay Simon & Larry Evans (vol. three 1999 revision) (West).

40. **The notion of "Added Value" was stated by Adam Smith as the valuation of goods that runs upward,** "beginning with the raw factors of land and labor, and continuing to the manufacturing of the final product that is sold to consumers." The value is "added" whenever the factors undergo change. The final good has a value that represents the total sum of all values made at each stage of production. "The prices of goods are derived from the summation of previous prices of production." William Anderson, *The Economics of Outsourcing* (last modified Apr. 21, 2004), *found at* http://www.mises.org/story/1488.

Thus, Added Value, originated as a national accounting concept, is the measuring of an additional contribution of a resource, an activity or a process in the realization of a product or a service. In its original meaning, Added Value is the difference between the value of production and the value of intermediate consumptions. Intermediate consumptions is the value of all the goods and services transformed or consumed during the production process. For example, in the furniture manufacturing business used as the hypothetical in this Article (see Part IV.A, *infra)*, intermediate consumptions include wood (the raw material incorporated in the final product) and the electricity consumed in the production process. Value added is different from profit in that to arrive at profit, other indirect costs (employee salaries, rent, etc.) must be further deducted from the value of the production. *Id.*

For an example of value added in a computer, see Hal R. Varian, *An iPod Has Global Value. Ask the (Many) Countries That Make It*, N.Y. Times, June 28, 2007, at C3) (tracing the production process and supply chain of an iPod to many countries and international companies to derive added value at different stages in the production process).

in today's information-based society is no longer the industrialization model of the 19th century, which motivated and brought about colonialism, i.e., the search for new sources of supplies and raw materials that ended in territorial conquest.[41] In the past century, colonialism caused the political division between the developed world (the ruler) and the colonized Third World (the ruled), followed by the spread of Marxism and the Cold War, all happening after decolonization of the Third World.[42] This political division has also created the divergence of value and voices between the North and the South (referring to the Northern or Southern Hemisphere[43]), which has persisted in the public international law discourse despite present day's globalization.

But, note that in the 20th century and continuously until now, long after decolonization, consumer commodity producers have taken their manufacturing to the developing economies for cheaper labor, the benefit of exploiting raw materials geographically at the source, and, perhaps to some investors, the doubled-edged advantages of doing business in a transitional, developing, and therefore flexible system of national law (or lack thereof).[44] All of this is evidenced by the significant outbound flow of FDI from the developed nations to the Third World, followed by the import of the Third World's cheaply produced commodities back to the developed nations for lower-cost consumption. This cycle of FDI has given rise to the kind of global economic development patterns condemned by certain activists as the

41. Today, it is unlawful to use of force to invade a nation for economic gains or to control its political process, although writers argue that conquest can still be made culturally and economically. The coming into force of the United Nations Charter ended the legality of acquisition of territorial title by military conquest. *See, e.g.,* U.S. Department of State, Documents on International Affairs 2662 (John W. Wheeler-Bennett ed. 1932) (Statement by Secretary of State Henry Stimson (the Stimson Doctrine), announcing that the U.S. would no longer recognize title to territory seized by armed force); League of Nations' Assembly Resolution (March 11, 1932), codified in the Chaco Declaration (August 3, 1932), the Saaverda Lamas Pact (October 10, 1933), the Montevideo Convention on the Rights and Duties of States (December 26, 1933); Inter-American Conference on the Maintenance of Peace (1936); Declaration on the Non-Recognition of the Acquisition of Territory by Force (Eighth Pan-American Conference 1938). *See also* Gerhard Von Glahn, Law Among Nations: An Introduction to Public International Law 367-76 (6th ed. 1992) (discussing illegality of involuntary cession of territory by conquest); Allan Gerson, "War, Conquered Territory, and Military Occupation in the Contemporary International Legal System," 18 Harv. Int'l L. J. 525 (1977).

42. *See* Tom Lansford, "Imperialism, Cultural" *in* 2 Encyclopedia of Western Colonialism Since 1450 572 (Thomas Benjamin ed. 2007).

43. David Schneiderman, Investment Rules And The New Constitutionalism, 25 Law & Soc. Inquiry 757, 767. (2000); Robert Goldscheider, Expanding Role of Licensing in World, in the Law and Business of Licensing, Licensing in the 1990s, at 1648, ed. Jay Simon and Larry W. Evans (vol. II 1999 revision) (West).

44. In general, reputable businesses will look for a national law system that is predictable, evenly and neutrally enforced, in order to eliminate political risks. However, some investors and entrepreneurs view the frontier nature of the developing economies – an operational environment of lesser regulation -- as a business advantage. For example, the chopping of trees, clearing forests, digging into the earth for raw materials will be scrutinized more closely by both government and the public in a more developed jurisdiction.

"colonists' return," or "neo-colonialism" relabeled as "free enterprise."[45] As illustrated below, industrial development and use of AI can potentially reverse such FDI pattern, but not necessarily for the betterment of the Third World.

IV.
A POSSIBLE REVERSAL OF PATTERN IN GLOBAL FDI

In the absence of regulation, large-scaled industrial and commercial use of AI may lead to a new global division of labor that pushes Third World workers further down the ladder of development. This potential negative effect will render the noble goals and aspirations of globalization a euphemism at best.

A● HYPOTHETICAL ILLUSTRATION [46]

Let's take a hypothetical case involving a Western European business that manufactures a product quite suitable for industrial application of AI: do-it-yourself, to-be-assembled furniture that comes in a carton box, made out of cheap wood but of functional design, manufactured cheaply in developing markets such as China, Vietnam, India, Romania, Sri Lanka, Mexico, etc. These carton boxes of do-it-yourself, to-be-assembled furniture can typically be sold inexpensively in low-priced department stores such as Ikea, Home Depot, or Lowe's in America. The combination of low cost and trendy, yet functional appearance, especial the adaptability of design as space fillers -- the optimal utilization of space in the average home in any culture: from bathroom corners to kitchen and hallway -- will make the product appealing and popular among middle- and lower-income consumers or even the upper class. For example, the success of IKEA products has proved this point.

I have chosen the furniture industry for this hypothetical because:

1. The raw supply of wood may heavily be regulated in the developed nations due to environmental concerns, making the extraction of this raw

45. *See e.g,* Tom Lansford, "Imperialism, Free Trade," *in* 2 Encyclopedia of Western Colonialism Since 1450, supra note 39, at 576. For a discussion of neoliberalism in context, see Maria Eugenia Padua, *Mexico's Part in the Neoliberal Project*, 8 U.C. Davis J. Int'l L. & Pol'y 1, 30 (2002).

46. The hypothetical used in this Article is based on real-life data and interviews of corporate executives and financiers who have successfully incorporated AI into their businesses or projects, together with entrepreneurs and founders of closely held hi-tech startup companies. However, due to proprietary concerns, the interviewees have requested that all identities be omitted and the real-life experience made into a generic hypothetical.

supply more attractive and cost-effective in the developing nations.

2. The furniture industry has relatively been slow to mechanization, traditionally suitable for the cheaper artisan skills of the developing nations, rendering the end products more competitive and cost-effective, compared to manufacturing in the developed economies.

3. This industry typically consists of enterprises that have grown from formerly family-held businesses, originally operating as "arts and crafts." With the business' maturity and growth, employees begin to develop professional skills and expertise, and acquire industry know-hows that can empirically be demonstrated.

Let's assume that for several years, this Western European manufacturer has steadily experienced a healthy annual increase in turnover of roughly 15%. This growth indicates the financial maturity of the business as well as the solidity of its market share, making the business "ripe" for AI application.

To the business decision-maker, steady turnover growth should call for expansion in manufacturing. However, because of the high costs of expanding manufacturing capabilities in the developed home country, the business would consider taking manufacturing and production to, for example, Asia,[47] for the geographical advantages of ready raw supplies (i.e., wood), cheaper labor, and the consumer market potential of a number of growing Asian economies such as India, China, Vietnam, etc.

Without AI. To manufacture in Asia, the business would need the

47. I use Asia for this hypothetical because of the continent's uniqueness on issues of economic development. While still possessing all characteristics of the transitional economies, the continent also offers examples of milestoned economic success in the case of Japan, Taiwan, South Korea, and more controversially China. In the cultural, metaphoric language of the Asian economist or business analyst, on the ladder of economic development, an Asian country first becomes a "Tiger," and then proceeds on to achieve the omnipotent economic status of a holy "Dragon." Peter A. Coclanis and Tilak Doshi, Globalization in Southeast Asia, 570 Annals 49, 53-55 (2000). While Japan has certainly evolved "out of the economic development ladder" all together to join the rank of superpower, commentators have labeled the remaining countries in Asia as either "Dragon" or "Tiger" in their perceived progress of economic development. *Id*. *Accord* Robert Goldscheider, Expanding Role of Licensing in World, in the Law and Business of Licensing, Licensing in the 1990s, at 1648, ed. Jay Simon and Larry W. Evans (vol. II 1999 revision) (West) (identifying South Korea, Taiwan, Singapore and HongKong as the "little tigers" of the early 1990s, and recounting the economic progress of Japan); Clay Chandler, Chasing the ***Dragon***, (March 19, 2007), http://chasingthedragon.blogs.fortune.com/2007/03/19/beyond-the-sweatshop-can-china-innovate/#comments (hard copy on file with author) (discussing China's economy by Fortune Asia editor) (*emphasis added*).
I have also selected Vietnam, France, and China as country examples because:
(i). France serves as a European contrast to America from the Western Hemisphere;
(ii) . Vietnam serves as an example of a transient economy that still struggles with political reform.
(iii). China is unique because of its "Dr. Jerkyll and Mr. Hide" unique status. China is an ambitious superpower and a developing economy at the same time, and its people are still struggling with standards of living and political freedom, contrasting interestingly with a proud national heritage and a collective propensity to respect hierarchy.

following:

A. A qualified management/professional/technical team at the headquarters level (for example, a dozen or so of financial professionals and engineers). Important functions covered by these employees include product concepts, research, and designs; raw material purchasing; technical management of factories; and logistics (warehousing and delivery).

B. An operational system at the factory level based on a "product line" concept, which consists of the following *nine* functions: The research and development that goes into system design can be kept at headquarters.

1) Receiving and stocking raw supplies (i.e., panels of wood)
2) Cutting the wood into various sizes of components
3) Decorative tasks for aesthetic designs
4) Preparing for assembly format (such as making holes in wood panels)
5) Preparation for, and actual, assembly
6) Quality control and checking
7) Packaging
8) Warehousing
9) Final delivery to retailers

In this system, to produce and deliver, for example, approximately 20,000 carton boxes of furniture per day, the traditional product-line factory will need to employ approximately 800 employees, including mid-level technicians trained primarily in machine operation.

Although the number of factory employees may grow, the nine functions identified above remain the same as the company changes from a family held business to a major corporation meeting large-scaled consumer needs, equipped with automation and hiring thousands of employees. In these automated, large-scaled factories, the role of the foreman (below the engineer) is extremely important. Human labor under the forman's supervision is needed for the operation and adjustment of machineries.

Now, AI comes into play.

With AI: For this furniture business, AI application will occasion the following principal changes:

A. At Headquarters Level: Work functions that must be covered by the key management/professional team of the pre-AI environment will remain the same, but the nature and substantive contents of each position or job description may change, requiring new criteria for hiring and new training for

each position. This is because AI will create a new "digital" work environment. Those managers and technical personnel who cannot adapt to the new training and expectations will be retired.

Further, via mathematical methods, AI will also formalize three principal functions:

(i) Product concepts and designs: Computerized, these functions will optimally meet specification requirements, optimize the ergonomics for the job of each operator at his/her workstation, and maximally save raw materials (using the same software that designs jet).

(ii) Factory technical management: Similarly, these functions will also be optimized, memorized and executed by computers.

(iii) Logistics: These functions will be operated by a "supply chain" software that can design and direct the transportation of the final products to warehousing facilities to achieve maximum time and space savings.

B. At Factory Level: AI will transform the traditional "product line" factory into a "digital factory," whereupon the operational system will now require a workforce of approximately 150 employees, instead of 800 employees as in the pre-AI environment. As a result of AI application in the three management functions identified above, the majority of operational or control tasks at the factory and warehouse, as well as related administrative management, are deleted. The nine functions at the factory level are still accomplished, but the needs for personnel have substantially been reduced. Support functions such as accounting, finance, sales, purchasing, etc. still remain, but each job description must change to accommodate the new digital environment. AI acts as the nucleus of technical and factory management, interconnecting all functions while streamlining and optimizing the operation.

As seen with the changes explained above, with optimum AI as an option, the shift of manufacturing to Asia for cost-savings is no longer a must for this furniture business. Now, the business can have the same factory production capacity with the same management/professional team, retrained to fit the "digital factory" concept in order to manage and operate the application of AI. The traditional factory of some 800 employees is no longer needed. If the cost of developing and applying AI is less than the cost of operating a traditional factory abroad, the business will be better off investing in AI domestically than opening an operation in Asia.

In fact, most likely this business will not have to shoulder the development

costs of AI technology directly. It is possible for AI to be commercially available just like Microsoft Window (although the operation of AI will require trained, skilled technicians, in contrast to the common usage of Microsoft Window by the general public). In other words, the cost of AI research and development can be a one-time cost, passed on to end-users for commercial use at an affordable fee. This unique feature distinguishes the Knowledge Economy from the old economy of the 20th century. In the old economy, wealth was built on ownership of commodities and raw material. Consumers' use of commodities and material depleted resources, thereby causing the fierce competition for ownership. In contrast, in the Knowledge Economy, AI (or Microsoft Window, for that matter) is an intellectual property (IP) not depleted when used. Market availability and mass consumption may lead to perfection of the IP product and more generation of Added Value, thereby stimulating innovation, invention, and more product development.

The economic decision to operate AI in a developed jurisdiction, rather than starting a traditional factory operation in Asia is further justified because it will remove the cloud of uncertain human rights and/or international tort liabilities faced by FDI investors.[48] The pioneering lawsuits filed in America, asserting violations of international law by U.S.-based multinational corporations with respect to their FDI activities in the Third World, have not been successful.[49] However, despite this lack of success, the U.S. statutes under which these claims were brought -- the Alien Tort Claims Act and the Torture Victims Protection Act[50] -- have opened the "door ajar" for the right "international tort" case of the future.[51] In interpreting these statutes, the U.S. Supreme Court has never completely closed such door.

Accordingly, safe risk-management corporate planning will counsel against the multinational corporation's future FDI if there is a better alternative. AI may offer that better alternative. By creating a new streamlined "digital" work environment, AI can change FDI choices and decisions: It *can* stop the current FDI flow to the Third World.

48. **Sosa v. Alvarez-Machain, 542 U.S. 692 (2004); Filartiga v. Pena-Irala, 630 F.2d 876 (1980); Alien Tort** Claim Act, 28 U.S.C. § 1350 (2000); Torture Victims Protection Act, 28 U.S.C. § 1350, as revised (2006). *See also* Edwin Gorham, The Alien Torts Statute and the Search for Energy in Difficult Political Environments (Houston J. Int. L Winter 2007) ("*The Alien Torts Statute, despite its venerable history, is alive and well to serve as a vehicle for aliens to seek redress in the federal courts of the United States for wrongs occurring overseas*"); Presbyterian Church of Sudan v. Talisman Energy, Inc., 453 F. Supp. 2d 633, 638 (S.D.N.Y. 2006).

49. *Id.*

50. **Alien Tort Claim Act,** 28 U.S.C. § 1350 (2000); Torture Victims Protection Act, 28 U.S.C. § 1350, as revised (2006).

51. *See, e.g.,* Sosa v. Alvarez-Machain, 542 U.S. 692, 729 (2004).

By now, readers may think that I have set out to prove the obvious – when machines replace humans, surely the need for Third World cheap human labor is eliminated. The analysis goes on to present a more complex picture of FDI decisions, as illustrated below.

B● EFFECT OF AI ON INVESTORS' FDI DECISIONS AND ON THE HOST COUNTRY:

1. The Investor's Perspective: Better FDI Choices to Achieve the Highest Profit

Although activists have criticized the "neo-colonialist" nature of investors' behavior, the Third World host country does benefit from FDI, technology transfer, training and employment opportunities for the local workforce, and the flow of hard currencies into the country (i.e., the dollar, the Euro, the pound, etc.). Further, FDI also stimulates a flow of services needed to support FDI into the country, adding to the transfer of the information to the local economy and workforce: the minute a manufacturer sets foot in the host country, an entourage of professional support services – law, accounting, financing, banking, etc. -- will accompany the investor. For that reason, the impact of FDI must be evaluated, not only based on the value of the investment, but also on the aggregate value of the service sector generated by the investment. AI may have put to stop to the flow of all of these benefits to the Third World economy if the manufacturer decides to stay home rather than going broad.

This means that in order to continue attracting FDI and receive the benefits thereof, the developing country must offer the investor some other competitive advantages such as (i) cost savings in distribution, transportation, and delivery of materials and products; and (ii) a huge and eager Third World consumer market. To the extent that technology producers may desire to use the "gray matter" offered by the Third World for their AI operation and support services, such local "gray matter" will be cheaper, and can even be of higher potential, constituting one more advantage offered by the Third World. For example, while China is called "the workshop of the world," India has been labeled "the laboratory of the world," the favorite outsourcing destination for technology producers and information businesses.[52]

52. Mark B. Baker, Awakening the Sleeping Giant: India and Foreign Direct Investment in the 21ST Century, 15 Ind. Int'l & Comp. L. Rev. 389, 394-98 (2005). *Cf* Robert Goldscheider, Expanding Role of Licensing in World, in the Law and Business of Licensing, Licensing in the 1990s, at 1651, ed. Jay Simon and Larry W. Evans (vol. II 1999 revision) (West) (describing the continuing 'brain drain' of India's creative scientific minds seeking technical and industrial careers in North America and the United Kingdom).

Most likely, it will be more advantageous for our furniture company to taking AI to Asia and open a "digital plant" there. If the company applies AI to its existing factory in the Western Hemisphere, the company will reduce the workforce from 800 to 150 employees, thereby facing the liability and public image issues associated with such substantial layoff. If the business is in Western Europe, layoff can be particularly problematic, with much union sensitivity, because of the "Welfare State" and pro-worker culture there. By taking AI to Asia for a brand-new 'digital plant," all those risks associated with workforce reduction[53] in the home country will be eliminated. If this is an American business, the transfer of AI technology can be limited to the dozen of American expatriate employees, thereby eliminating all concerns regarding U.S. export control laws prohibiting the transfer of "dual-use" technology to foreign users in a "suspect" country ("suspect" in the sense of the national security interest of the U.S.).[54]

Accordingly, our hypothetical furniture manufacturer may still want to take its AI operation to Asia, where the raw resources (i.e. wood) may be located. The furniture can be manufactured cheaply yet efficiently in Asia via the use of AI, with minimal capital outlay. Labor costs, liabilities, and management headaches associated with the operation of local facilities and the massive employment of local labor will have been minimized or eliminated. The manufacturer achieves the immediate savings in the transportation and delivery of raw supplies, because manufacturing is done right at the source, where wood is found. The furniture manufactured in Asia can then be sold immediately into the huge consumer markets of Asia (i.e., heavily populated countries like China, India, and Vietnam). This represents another layer of cost savings in the distribution, transportation, and delivery of the final products to end-users.

In summary, without AI, manufacturing at home may be too high a cost, while manufacturing abroad – where the raw resources are located – can be a high-risk proposition. Yet, for cost-savings, a business may have no choice but to bring its manufacturing to the Third World, even if the host country or the region offers no lucrative consumer market for the products. Once abroad,

53. Those labor risks may be more discouraging in Europe than in the U.S., which is an "employment at will" country.

54. **Export Administration Act of 1979, 50 U.S.C. app.** §§ 2401-2420 *et seq*. (2000) and Export Administration Regulations, 15 C.F.R. 730-774 *et seq.* (2004). "Dual use" is defined as "EAR-controlled items that can be used both in military and other strategic uses…and commercial applications." 15 C.F.R. Section 730.3 (dual use exports).

the business may be left with no choice but to partner with the government of the host country to achieve support and stability for its investment. Economic considerations call for an interest alignment or "de facto cartel" consisting of governments and foreign investors.[55] The outbound FDI flow may then "turn around" in-bound, with the products being re-exported back to the home country for low-cost consumption there. This has been the economic model and FDI pattern of the past and the present.

Now, with AI, the investor no longer has to go abroad for cost savings just because it cannot afford to manufacture back home. AI maximizes the investor's freedom of choices to take FDI wherever it can envision the highest profit depending on the unique needs of the business. Now, the investor can *choose* to go abroad only if other cost benefits and business incentives are present. In other words, AI can eliminate the comparative advantage of the Third World. With AI, the establishment and operation of the "digital factory" abroad will be much easier, more streamlined, more efficient, and perhaps with lower liability exposure because the human factor has been minimized. The investor may also be able to contain trade secrets and proprietary technology to expatriate employees or core management.

Further, without AI, in the past, the investor might have to accede to various national law requirements or contractual demands of the host country or the local partner, including technology licensing, labor, or terms and conditions that do not serve its business objectives, simply to have its operation in the country. With AI, the investor can virtually eliminate such *involuntary* investment decision. Now, the FDI decision, plus any decision to transfer the AI technology to the local partner, will depend entirely on investor's business goals. Thus, from the investor's perspective, the use of AI promotes efficiency and maximizes profit, fitting squarely into Stuart Mill's utilitarianism paradigm.[56]

2. *The Host Country's Perspective*: Loss of Comparative Advantage and the Potential Danger of "Ghetto'ing" the Third World's Workforce

55. I explored the danger of this "de facto cartel" – the government-investor partnership – in the energy sector in my twin articles. *See* Wendy Duong, Partnerships with Monarchs – Two Case Studies: Case One: Partnerships with Monarchs in the Search for Oil: Unveiling and Re-Examining the patterns of "Third World" Economic Development in the Petroleum Sector," 25 U.Penn.J.Int.Econ.L. No. 4 1171, n. 12 (Winter 2004); Wendy Duong, Case Two: Partnerships with Monarchs in the Development of Energy Resources: Dissecting an Independent Power Project and Re-Evaluating the Role of Multilateral and Project Financing in the International Energy Sector, 26 U.Penn.J.Int.Econ.L. No. 1 69 (Spring 2005).

56. John Stuart Mill, *Utilitarianism*, in Utilitariansim, Liberty, And Representative Government (1951) (1st ed. London 1863).

A New Division of Global Labor. Note that in an optimal AI environment, the company no longer needs to hire or train a significant local workforce. The education or sophistication of native personnel no longer matters. Potentially, at optimum operation, AI can produce a magical result without much human labor: the simple pushing of a button can quickly produce the perfectly packed carton box of do-it-yourself furniture, ready to be shipped (the same process as in the industrialized, automated making of…sausages!).

So what happens, then, to the potential workforce of Asia? The production workforce will substantially be replaced by computers, although not entirely eliminated. In the new system design, human labor can be reduced to the bottom level of the "skill sophistication ladder" – only a limited number of workers are now needed, either in top management or only for those trivial tasks that require no to little training or technology transfer (for example, certain human jobs involved in the warehousing of those carton boxes cannot or do not need to be replaced by a computer or robot). Naturally, the manufacturer's payroll will also be significantly reduced.

Phrased differently, optimal AI can literally eliminate the "middle level" of native labor where training and technology transfer once typically occurred. In the old system, these mid-level foremen or skilled workers were needed to run the manufacturing line or production system – they made and implemented those human decisions needed in a traditional factory environment. Generally speaking, this middle level of workers used to be the recipients of technology transfer and training among the native population. They became the candidates for upward mobility – those natives who would eventually have a chance at running the operation to replace the expatriate manager sent by the corporate employer. Like the middle class in society, these mid-level workers represented the hope of the host country in terms of skill upgrade and management potential, such that they could eventually become future leaders of the native workforce and the essential link or cultural interface between the host country and the foreign investor. Put bluntly, the mid-level native workers can now be discarded and replaced by sophisticated computers that can efficiently simulate the human mind. The embryonic new middle class for the developing economy has literally been wiped out in the age of high-tech invention.

As mentioned earlier, in the new "digital" environment, the transnational investor can limit knowledge of the AI system design and operation to the few

expatriate managers, and/or at most a handful of "the privileged few" in the native population – those who have been chosen by the business to receive the knowledge base crucial for the operation of AI. Only these privileged few will be given the opportunity to join the technology-oriented, information-based society, via the privileged sharing of knowledge. In a less-than-democratic Third World nation plagued with poverty and corruption, with a dictatorship in place and no healthy middle class, these privileged few most likely have come from, or are situated to become, the ruling elites of the country, having collaborated and shared profit with the foreign investor.[57] Thus, optimum AI has helped re-create and perpetuate the "privileged few," "neo-colonialist," "ruling elite" socio-political structure in the Third World. This effect might not have been envisioned at all by those pure-minded scientists or mathematicians when they invented AI in their lab!

Now the danger has fully emerged. AI, in optimum form, not only reduces the Third World workforce or the payroll of the foreign investor, but it can also "ghetto" Third World workers down to that bottom level of skills and tasks, thus eliminating their upward mobility to middle levels and beyond. AI can push the lesser-educated native workforce to the lowest echelon, while paradoxically creating a very small native ruling class having access to information by virtue of their collaboration and sharing of the powerbase with the boss. This gloomy picture does reiterate the fear and criticism voiced by activists – that indeed globalization may witness the creeping return of

57. U.S. courts have frowned upon those transnational corporations who joint ventured, participated or served as partners of dictatorship governments who commit violations of human rights. *See, e.g.*, John Doe I v. Unocal Corp., 395 F.3d 932 (9th Cir. 2002). During civil unrest in Myanmar, Unocal took part ownership in a venture with the government to extract natural gas Unocal used Myanmar's military to provide security for this venture. Villagers of Myanmar claimed that Unocal aided and abetted the military in subjecting villagers to forced labor, murder, rape, and torture during the construction of the natural gas pipeline in Myanmar. The lower court granted Unocal's summary judgment on these claims. The Ninth Circuit Court found that sufficient fact issues existed to preclude summary judgment in respect of all charges except torture. Because the case was settled, Unocal's ultimate liability was not judicially determined. However, the Ninth Circuit did impose a stringent test for determining Unocal's liability, requiring elements such as "knowing practical assistance or encouragement," "aiding and abetting" or "control" of governmental action.For a more complete picture of ATCA actions filed as a result of transnational corporations' "entanglement" with repressive regimes for profit-making in infrastructure development, security arrangements, labor utilization, or environmental-impact projects, see, *e.g.,* Wiwa v. Royal Dutch Petroleum Co., 226 F.3d 88, 92 (2d Cir. 2000); Doe v. UNOCAL Corp, 248 F.2d 915, 920 (9th Cir. 2001); Doe I v. UNOCAL Corp., 963 F. Supp. 880 (C.D. Cal 1997); Doe I v. UNOCAL Corp., 110 F. Supp. 2d 1294, 1296 (C.D. Cal. 2000); Bowato v. Chevron, Docket No. C99-2506 (N.D. Cal. 1999); Jota v. Texaco, Inc. 157 F.3d 153, 163 (2d Cir. 1998); Aguinda v. Texaco, Inc., 1994 WL 142006 (S.D.N.Y. April 11, 1994); Aguinda v. Texaco, Inc., 945 F. Supp. 625, 627 (S.D.N.Y. 1996, *vacated*, Jota v. Texaco, Inc., 157 F.3d 153 (2d Cir. 1998); Aguinda v. Texaco, 2000 WL 122143 (S.D. N.Y. Jan. 31, 2000), *aff'd* 303 F.3d 470 (2d Cir. 2002). *See also* Bennett Freeman, Deputy Assistant Secretary of State for Democracy, Human Rights, and Labor, "Remarks to the Third Warwick Corporate Citizenship Conference (July 10, 2000), *found at* www.state.gov/wwww/policy_remarks/2000/00710_freeman_warwicku.html.

colonialism. The 'ghetto'ing" of the native population, i.e., the denial of training, upward mobility, and access to information, is a concern held by the former chief economist of the World Bank and a Nobel prize winner in economics.[58] In short, the economic model that produces ideas and knowledge can lead to more inequality than that which manufactures goods. The propensity to exclude people who do not have ideas and knowledge replaces the propensity to exclude those who did not own raw materials and commodities in the olden days.

The Illusion of Free Trade. In such a pessimistic vision, what good would it do for a Third World country to join the WTO? What good would it do for the "ghetto" to enjoy free trade? The "freedom to slave" across national borders is no freedom at all! WTO membership will simply allow the least developed Third World economy to export raw materials and agricultural products under the philosophy (and illusion) of "free trade." In other words, the "ghetto'ed" Third World uneducated worker will be doomed to shoulder the supply of raw materials and agricultural products for the rest of the world. Meanwhile, unable to produce technology products (such as AI), these agricultural and raw material producers will have to purchase and consume technology from the superpowers. The Third World will likely become the "dumping ground" for obsolete technology or less-than-state-of-the-art products. FDI trend and trade pattern will look something like this: the developing nations sell raw material cheaply; the industrialized nations sell high tech expensively. AI can create and perpetuate such imbalance.

So-Called "Neo-Colonialism" in the Information Age and the New Economy: The danger articulated above should not be anything new to economists, who undoubtedly are familiar with *the law of comparative advantages* advanced by David Ricardo.[59] In Ricardo's theory, a country that is best at making shoes should make and sell shoes, while a country that is best at making cakes should make and sell cakes. They will end up exchange shoes for cakes, and vice versa, to maximize their comparative advantages, rather than making both shoes and cakes in order to become self-sufficient.[60] In Ricardo's theory, after trading, both countries will end up with more supplies of cakes and shoes – an increase in wealth. Ricardo's theory remains part of the underlying principles, if not to say the backbone, of today's international

58. Joseph E. Stiglitz, Globalization and Its Discontents (W.W. Norton & Co. 2003).

59. The Principle of Political Economy and Taxation, David Ricardo (Dover Value edition 2004).

60. *Id.*

trade/WTO system.

In fact, the danger is *déjà vu*, judging from the England-India colonial relationship during the industrialization era of the 19th and 20th centuries. As predicted by Ricardo, industrialization caused England to abandon the growing of agricultural products, as the population of farmers in England dropped from 70% to 25% as of 1840 because of industrialization.[61] England then turned to its colony for the supply of agricultural products. For example, England caused India to grow and export cotton. The result was (i) India ended up having to import textile from England in order to satisfy India's domestic needs; and (ii) India could not grow rice in order to supply its own people with food, and the country suffered from starvation in hard economic time. England also discovered that India's "comparative advantage" was poppy flowers, so India ended up growing poppies. When China forbade the import of opium into its territory, the Opium War was brought about in China, forcing it to continue receiving this dangerous commodity. These were some historical highlights of the early form of "globalization" and "international trade" in previous centuries.[62]

Now, the same phenomenon can happen in the New Economy of the Information Age, although there is supposedly no more colonialism. In summary, if my hypothesis proves correct, large-scaled industrial application of AI may cause the traditional pattern of FDI flow from "rich" to "poor" to stop. The South will lose its comparative advantage of cheaper labor, yet is still forced to compete in the global market. For FDI flow to the South to continue, the South will have to offer investors some substitute advantages to resist the reversal of the existing FDI pattern, including the South's potential as a consumer market to absorb production of Western products. If or where FDI continues to flow to the South, this time with AI technology and a new set of investor considerations and advantages, a new division of labor will occur, making the poor poorer because of the "ghettoing-down" effect upon the South's workforce. Accordingly, the new division of labor will widen and deepen the divergence between North and South.

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61 *Id.* Daniel Cohen, Richesse du monde, pauvrete des nations [wealth for the world, poverty for nations], at 52 (Flammarion 1997).

62. *Accord* David Cannadine, Ornamentalism: How the British Saw Their Empire (NY: Oxford Univ. Press 2001); Raymond E. Dummet, ed. Gentlemanly Capitalism and British Imperialism: The New Debate on Empire (Harlow, UK: Longman 1999); Fieldhouse, David K, The West and the Third World: Trade, Colonialism, Dependence, and Development (Oxford, Oxford Univ. Press 1999); David Armitage, Ed. Theories of Empire: 1450-1800 (Aldershot, UK: Ashgate, 1998).

In other words, at the end of the day, the Northern Hemisphere will produce and export products resulting from the highest "added value" made possible by intellectual property -- the "gray matter." The Southern Hemisphere will produce products involving artisan skills or other manual labor and raw materials. In the high-tech global economy, the North will produce and export software, while the South will produce hardware computers. The North will produce the contents for television, while the South will manufacture the television itself. Take another industry that requires both manufacturing and service: France, in the North, will produce concepts, designs and marketing for fashion apparel and sophisticated sportswear, while African, Latin American, and Asian states will produce shoes, baskets, and cheaper, ready-made clothing based on designs and concepts developed and marketed in France and the West.

No longer a Third World problem. Broadly considered, the danger is not confined to the Third World. The "ghetto'ing-down" effect of AI upon the population is not just a Third World dilemma. This risk can also occur in the developed nations as well -- the lesser educated, lesser-equipped, and disadvantaged segments of society (including "undocumented aliens," disadvantaged women and ethnic minorities) can also be left out of the New Economy and pushed down to the bottom of society. Robert Reich has predicted and described this "ghetto'ing" effect right in the heart of the developed economies.[63]

According to Reich, American society is, and will be, fragmented into four divisions of labor: 1) the manipulators of symbols or producers of ideas, or intellectual products that most benefit from globalization in the Information Age;[64] 2) those working to benefit the Welfare State (e.g., professors, health care professionals, etc.); 3) service providers (e.g. restaurants, barbers, etc.); and 4) workers who handle repetitive service tasks that can easily be replaced, outsourced or delocalized (e.g., those who feed data into computers, phone operators, customer service operators, etc.).[65] With globalization, labor category #1 will be most desirable and privileged, and will come out ahead

63. *See* Robert Reich, The Work of Nations (NY Vintage 1991).

64. For another realistic, narrower view of labor division, see Lee Loevinger, Reflections on Computer Technology & The Law: The Invention and Future of the Computer, 15 J. Marshall J. Computer & Info. L. 21 (Fall 1996) (forewarning the coming of an Information Revolution: "[*S*]*ociety will be divided into a class of sophisticated technological technocrats, who are able to cope with and afford all the complexities of advanced networks and mechanisms, and a much larger class of plebeians who still have trouble programming their VCRs…*")

65. Loevinger, i*d.;* Reich, *supra.*

in market competition; category #4 will be most disadvantaged and fungible (especially with AI being applied to the service sector). Categories #2 and #3, comparable to what is commonly known as the Middle Class, will struggle to become part of Category #1, easily becoming torn apart by fierce internal competition and economic conflicts, and ultimately running the risk of being demoted and ghetto'ed down to fungible Category #4. Reich's gloomy vision helps explain the vehement objections to globalization raised by various workers' and special interest groups in America.[66]

V.
A REALITY CHECK: THE EMERGING SIGNS

Recent and current business and corporate behaviors already show signs that lend support to my hypothesis. A few examples are highlighted below.

- *First,* the transformation of modern society into the New Economy is evident. Statistics released by the Organization for Economic Cooperation and Development (OECD) in 2000 shows that as of 1999 (just before the current millennium), total private investment in equipment and software in the Information and Communications Technology sector (ICT) totaled approximately 900 billion dollars.[67] In the U.S., informational activities have continued to represent approximately one-third of the GDP, and employment of the sector has grown faster than the rest of the economy. As of 1997, approximately 35% of the value added to corporations came from the knowledge-based businesses. Since 1990, approximately one-fourth of corporate investments are devoted to the production or purchasing of knowledge.[68] Within the OECD, the share of "knowledge-based market" services has continued to rise, accounting for over 20% of aggregate added value as of 2005.

Yet, there has also been a recent drop in global FDI, signifying changes in FDI patterns that appropriately call for closer scrutiny of global production

66. *See, e.g., See, e.g., Smaller Shares, Bigger Slices*, The Economist, April 7, 2007, at 76; Adrian Wooldridge, *Globalization: On a TV Near You, Protest Without End*, L.A. Times, Aug. 20, 2000, at 1; Martha McCluskey, *Seattle Protests Brought Together Some Unlikely Allies*, Buffalo News, Dec. 12, 1999, at H5.

67. US Bureau of Economic Analysis (March 2000), from "A New Economy? The Changing Role of Innovation and Information Technology in Growth (OECD 2000).

68. US Bureau of Economic Analysis (March 2000), from "A New Economy? The Changing Role of Innovation and Information Technology in Growth (OECD 2000).

chains. According to the World Bank, global FDI was valued at U.S. $202 billion in 1990, peaked in 2000 at U.S. 41.5 trillion, but dropped to U.S. $631 billion in 2002.[69] Nonetheless, the foreign investor remains significant control over the management of entities invested, with cross-border mergers and acquisitions accounting for a good portion of global FDI, demonstrating the tendency for concentrated control at the top.[70] Experts note that the industries in which global production predominates include high technology and labor intensive consumer goods, in which Americans have an important piece of the pie.[71]

Meanwhile, a retrospective look at the 1990s shows that where possible, transnational corporations resisted technology transfer to the Third World, even if the transfer was in the form of intra-firm transactions. According to researchers, the transfer of research and development (R&D) activities from transnational corporations (i.e. the private sector's share of R&D costs and investments) to foreign subsidiaries in the developing nations in the 1990s was made on a very limited scale, basically relative to adaptive tasks. This meant that those corporations were attracted to build R&D facilities in the developing nations only in exceptional cases where adequate infrastructure and high quality local personnel existed.[72] In the 1990s, the bulk of R&D remained within the industrialized countries.[73] Overall, although world trade has soared, the expansion has remained unevenly distributed,[74] and expert reports point to uneven growth patterns in the developing world: in the last two decades, most of the "Least Developed Countries" (LDCs) sustained a proportional decline in their share of global markets.[75]

69. THE WORLD BANK GROUP, WORLD DEVELOPMENT INDICATORS 2004 at 303 (2004), *found at* http://www.worldbank.org/data/wdi2004/index.htm.

70. Blanpain, Bisom-Rapp, Corbett, Josephs, & Zimmer, The Global Workplace at 4-5 (Cambridge University Press 2007).

71. William Milberg, The Changing Structure of International Trade Linked to Global Production Systems: What are the Policy Implications? (ILO Working Paper No. 203, 2004), *found at* www.iol.org/public/english/bureau/integration/globaliz/pulicat.htm; Hilary K. Josephs, Upstairs: Trade Law; Downstairs: Labor Law, 33 GEO. WASH. INT. L.REV. 849, 860 (2001). Blanpain, Bisom-Rapp, Cobertt, Josephs & Zimmer, The Global Workplace at 4-5 (Cambridge University Press 2007). *See also* Rober Blapain &Michaele Colucci, THE GLOBALIZATION OF LABOUR STANDARDS: THE SOFT LAW TRACK 3 (2004) (noting that 25% of employment in the technological enterprises in Belgium is in the U.S.' hands).

72. Carlos Correa, Prospects and New Dimensions of International Transfer of Technology: An Issue Paper, in The Law and Business of Licensing, ed. Jay Simon & Larry Evans (vol. 3 1999 revision) (West).

73. *Id.*

74. Susan Hayter, The Social Dimension of Globalization: Striking the Balance, 55 BULL. COMP. LAB Rel. 1-10 (Kluwer Law Int'l 2004).

75. World Com'n on the Soc. Dimension of Globalization, A FAIR GLOBALIZATION CREATING OPPORTUNITIES FOR ALL 25 (2004), *found at* http://www.commissiononglobalization.org/homelinks/AfairGlobalization.pdf.

The conclusion seems to be that policy-wise, strong pressures exist to privatize scientific knowledge and technology, but only within the investors' borders or within the developed world. This creates tension among the various forces underlying global policymaking, and demonstrates the ongoing divergence between North and South: the encouragement of international scientific cooperation on one hand, and limit of access to the development of science and technology on the other hand.

- *Second,* there has been a dire need and willingness for U.S. corporations to absorb foreign Information Technology (IT) workers to serve America's demand for technology invention and production. For example, in order to achieve cost-savings, rather than hiring U.S. computer science graduates, U.S. giant corporations and technology producers have been extracting IT professionals from the developing nations (e.g., places like China and India).[76] At the same time, again, for cost savings, rather than hiring U.S. workers, U.S. businesses are also outsourcing routine technology-related work, or menial, repetitive service tasks supporting computerized operations to the developing nations -- nowadays, customer service representatives of American businesses may actually be sitting somewhere outside of America, armed with a standardized script on what to say or what to do if a customer calls in with a problem.

The following OECD statistics released as of 2000 confirmed that the US attracted skilled workers from abroad, and US firms went overseas to access required skills: In 1995, 50% of US doctoral degrees in mathematics and computer science were earned by foreign students; about half of the doctoral recipients from China and India decided to stay in the U.S.; of all science and engineering doctoral students who had firm plans to stay, about one-third were from Asia; nearly one-third of the Silicon Valley's workforce was composed of immigrants, with about two thirds of them from Asia. Between 1995 and 1998, Chinese and Indian engineers started approximately 29% of the Silicon Valleys' technological companies, and a quarter of Microsoft's employees was foreign-born. The largest net loss of engineers appeared to be in non-OECD countries, and both India and Israel were home to software development

76. Correspondingly, the U.S. Immigration Act of 1990, amending the Immigration and Nationality Act (INA), specifies employment-based preferences in immigration and establishes the following categories: persons with extraordinary ability, outstanding researchers and professors, multinational executives and managers, professionals holding advanced degrees or aliens of exceptional ability in sciences, arts or business, and other skilled and unskilled workers. Immigration and Nationality Act §203, 8 USCS § 1153 (2006); 8 C.F.R. §§ 204.5, 204.6 (2007).

centers for Hewlett-Packard, IBM, Intel, and Microsoft.[77]

- *Third,* as already explained, FDI flow from the developed nations may no longer just reflect the type of human labor considerations that render the Third World attractive. Overall, despite improvement in Third World legal environments to encourage FDI to parallel free trade, a substantial portion of FDI has taken place in the wealthy developed nations, where labor is much more expensive.[78]

In particular, nowadays, technology exporters also look at other advantages offered by the host country such as its potential consumer market. The example of Intel Corp.'s 2005 plan to invest in an assembly plant in Asia for its personal computer manufacturing demonstrates this thinking.[79] In 2005, according to an Associated Press report,[80] the semiconductor giant considered shifting manufacturing to South and Southeast Asia for cost savings. Intel's CEO was quoted as saying that Vietnam was considered because of its demonstrated consumer potential – Internet usage has soared in the communist country, which has emerged as the fastest growing personal computer market of all ASEAN nations, with computer ownership jumping to 1.3 million units in 2005, compared to just 288,000 at the beginning of the millennium.[81]

- *Fourth,* the case of FDI in Vietnam may also demonstrate the emerging changing pattern in FDI –that complex, multi-layered FDI considerations no longer depend solely on the cost of labor or initial overhead. For example, both Intel and Proctor-Gamble considered manufacturing in Vietnam. Yet, Intel went ahead with the plan, while Proctor-Gamble reportedly suffered from large losses and abandoned the project.[82] Apparently, the cheap labor and low cost of doing business in Vietnam do not provide sufficient incentives for Proctor Gamble to further its investment there. In contrast, Intel's decision to establish manufacturing in Vietnam could result from, *inter alia,* (i) Intel's assessment of Vietnam as the potential consumer market for personal computers; and (ii)

77. A New Economy? The Changing Role of Innovation and Information Technology in Growth, at 44-47 (OECD 2000).

78. WORLD COM'N ON THE SOCIAL DIMENSION OF GLOBALIZATION, FACTS AND FIGURES, at 1 (2002) (citing U.S. as leading global FDI).

79. Spencer Chin, "Intel adds Vietnam to list of sites for assembly plant, says reports," *found at* http://www.eetimes.com/news/latest/showArticle.jhtml?

80. Valerie Clemen, A Briefing for American Businesses Looking to Invest in Vietnam, 2 Hastings Bus. L.J. 507, 512-13 (2006); *Earnings Preview,* AFX NEWS LTD. (Asia), Jan. 12, 2007; Jason Folkmanis and Ian King, *Intel obtains license for Vietnam Plant*, The International Herald Tribune, Mar. 1, 2006.

81. *Id; see also* Chin, *supra* note XXX.

82. Mark Landler, Widening Gaps that Keep Vietnam Divided, New York Times, Apr. 21, 2000, *found at* http://www.mishalov.com/Vietnam_economy.html.

the success that Intel has had with the hiring of Vietnamese IT personnel in America – an indication of the "gray matter" potential of Vietnam, at cheaper costs. Obviously, the local "gray matter" potential is more essential to Intel's technology business, compared to Proctor-Gamble.

- *Fifth*, an examination of FDI statistics shows that today, perhaps big businesses may not be as motivated to take their FDI to the developing nations as they tended to do decades ago. For example, FDI into OECD countries in 2006 reached its highest level since 2000, led by the U.S. and followed by France. The OECD report on Trends and Recent Developments in Foreign Direct Investment forecasts inflow of FDI to its 30 member countries to increase by 20% in 2007.[83] This suggests that perhaps the reversal of FDI pattern may already have happened. Let's look at FDI in France as an example. Recent statistics shows that as of 2006, on France's stock market index CAC40 (the French equivalent of Dow Jones), aggregately 46.2% of French corporate ownership is non-resident.[84] Similarly, in order to service Europe, Toyota has recently set up manufacturing in France (rather than some Eastern European developing nation). These facts indicate that major investors are no longer deterred by (i) the high costs of living and doing business in France, or (ii) other complex workforce or labor issues unique to France (e.g., the history of France's organized yet turmoiled union system, plus the extraordinary high tax paid by workers to fund France's social benefits[85]).

It follows, therefore, that big businesses' decisions to invest in France must have been prompted by considerations other than costs of labor or costs of doing business in a foreign country. The considerations may include the attractiveness of doing business in France: excellent infrastructure, high productivity and skill levels of researchers, technocrats and management personnel (i.e, the kind of workers least likely to be pushed down into the ghetto in the AI revolution),[86] and, last but not least, excellent quality of life -- In France, workers enjoy a 35-

83. http://www.oecd.org/dataoecd/62/43/38818788.pdf.

84. "La detention par les non-residents des action des societes Francaises du CAC40 a fin 2006," Bulletin de la Banque de France No. 161. May 2007.

85. "France Taxation," http://www.nationsencyclopedia.com/Europe/France-TAXATION.html (last visited 7/4/2007). and Chiara Bronchi and Flip de Kam, "The Income Taxes People Really Pay," OECD Observer, Apr. 1999, *found at* http://www.oecdobserver.org/news/fullstory.php?aid=77.

86. 2006 OECD data show that France ranks in the top five of member countries so far as the total number of researchers is concerned, although France's gross domestic expenditure on R&D activities is relatively modest. The U.S. tops the list so far as the total number of researchers in its workforce and the highest amount of gross domestic expenditure on R&D activities. OECD, Main Science and Technology Indicators, Vol. 2007/1, Key Figures.

hour work week, five weeks' annual vacation, hefty government-secured social benefits, trendy, first-class cultural lifestyle, healthy sports such as bicycling and soccer, gourmet food, beautiful sceneries, and easy access to the cultural centers and world-class tourist attractions and resorts of Europe.[87]

Take another example: the apparel fashion industry in France. What happens there may also confirm the beginning of FDI trend reversal. This type of industry, for which France is world famous, is known to have applied AI effectively to the manufacturing side of the business, thereby freeing the human brain for more aesthetic design. A look at this industry suggests that French producers have not been too keen on shifting manufacturing to the Third World. One plausible explanation is the possibility that advanced technology (such as AI) has kept costs sufficiently down for French producers to retain production (and the accompanying know-how) within the home country.

· *Sixth,* expert discussions about China as a typical picture of the developing East Asia reflect the same concerns explored in this Article. Since 1992, China has become the largest recipient of FDI among all developing economies – in 2002, China's inbound FDI increased to US $52.74 billion, ranking second place worldwide, after Luxemburg.[88] As of 2004, according to China's Ministry of Commerce, about 690 research facilities had been set up by multinationals, total FDI stock reached $561.1 billion, and the government had long developed technology parks allowing foreign firms to form building blocks with Chinese high-tech industry.[89]

But experts also note that technology transfer from FDI to China is still limited.[90] Much of China's FDI technology inflows have come from low-tech HongKong, for example, and are concentrated in labor-intensive industries. Overall, China has attracted much less FDI from high-tech OECD countries than what should be expected based on China's GDP size and human capital quality. The "technology gap" between the investing countries and China has

87. *See, e.g.*, Todd Rakoff, Book Review: The Law of Social Time A Time for Every Purpose Law and the Balance of Life, 76 Temp. L. Rev. 357, 362 (2003).

88. Justin Yifu Lin, The China Miracle: How OECD Country Policies Contributed? (May 2004) (preliminary draft), prepared for the Conference "The Impact and Coherence of OECD Country Policies on Asian Developing Economies" (Paris June 10-11, 2004).

89. Douglas Zhihua Zeng & Shuilin Wang, China and the Knowledge Economy: Challenges and Opportunities, World Bank Policy and Research Working Paper 4223 (May 2007), *found at* http://www.wds.worldbank.org/external/default/main?page.

90. Douglas Zhihua Zeng & Shuilin Wang, China and the Knowledge Economy: Challenges and Opportunities, World Bank Policy and Research Working Paper 4223 (May 2007), *found at* http://www.wds.worldbank.org/external/default/main?page.

commonly been perceived to be approximately 20 years.[91] In general, Chinese firms do not have sufficient resources to carry out R&D activities; better college graduates go abroad or work for multinational corporations; and the nation's R&D's expenditure remains relatively low by international standards.[92]

What's more, Business Week reported on researcher's concern that China's strategy of upgrading its technology market via FDI and price competition based on its comparative advantage of cheap labor might have worked in the past, but not necessarily constituting the answer to China's economic woes. Overall, Chinese enterprises tend to import to upgrade production technology, and these equipment purchases prevail over software, patents, and know-hows, resulting in the vicious cycle of "importing, lagging behind, importing again, and lagging behind again."[93]

Experts describe technology trades to and from China as "triangular" – parts for electrical devices produced by Japan and other newly industrialized Asian nations are exported to China (as well as other ASEAN countries) for assembly, and then the finished products are then exported to Europe and North America,[94] among which are intra-firm re-exports.[95] Thus, China (as well as other ASEAN countries with cheap labor as their comparative advantage) has been a huge assembly hub and production site for low-tech goods.[96] This triangle has been an important channel for technology transfer, and has accounted for China's claim of rapid improvement of the high-tech content of its foreign trade. In his 35-page "Reinventing China," Andy Rothman, a Shanghai-based economist, pointed out that notwithstanding China's seeming burgeoning growth, about 90% of its high-tech exports were produced by subsidiaries and joint ventures of foreign multinationals; Chinese workers contribute only a small share to the value added to high-tech products shipped from China; in 2004, Chinese patent applications accounted for only 1.4% of

91. Yasheng Huang, The Benefits of FDI in a Transitional Economy: the Case of China, OECD Global Forum on International Investment – New Horizons and Policy Challenges for Foreign Direct Investment in the 21st Century (Mexico City Nov. 26-27, 2001). Mr. Huang is Associate Professor of the Harvard Business School.

92. *Id. Accord* OECD 2007, Main Science and Technology Indicators, Vol2007/1, Key Figures (showing comparatively China's R&D gross expenditure).

93. Business Week, International – Readers' Report: Cong Cao, China: Cheap Labor and Foreign Investment Aren't Enough" (Nov. 16, 2002), *found at* http://www.businessweek.com/magazine/content/02_06/c3808148.htm.

94. Mona Hanad EASPR, Trade Integration in East Asia: The Role of China and Production Networks, Word Bank Policy Research Working Paper 4160 (March 2007), *found at* http://www-wds.worldbank.org/external/default/main>page.

95. Schaaper, at 60.

96. Hanad, *supra;* Martin Schaaper, An Emerging Knowledge-Based Economy in China? Indicators from CD Databases, STI Working Paper 2004/4, Statistical Analysis of Science, Technology and Industry (OECD 2004).

total global patent applications, and mainland applicants received only .05% of all U.S. patents granted to foreigners. In other words, the technology upgrades of China (and other ASEAN countries) remain circumscribed to the production and export network of foreign firms and therefore dependent on the multinationals' foreign affiliates.[97] This presents an impediment to the widespread dissemination of technological know-hows. Yet, these high-tech imports have been used by China as substitute for local R&D commitments.

In summary, these signs show that the developed nations' technology producers will continue to look at the developing world for cost-savings, and for skilled or unskilled labor supply either via (i) outsourcing or shifting menial production, low-tech production, hardware assembly, or service tasks to the developing nations, and/or (ii) importing migrant technology workers or foreign "gray matter" at lower costs. At the same time, technology producers will also look at the developing world as potential consumer market. These activities help create the "triangular" FDI pattern described above in the example of China. The futuristic optimum application of AI will widen and lend more meaningful nuances to investors' FDI choices, but those same AI-driven choices may hurt the native workforce and jeopardize the national interest of the developing host countries.

VI.
IN SEARCH OF SOLUTIONS

Having examined reality as well as the futuristic vision, I identify below *three general* areas for possible solutions: Law, Education, and Politics.

A. IN THE DOMAIN OF LAW

For purposes of this Article, the lowest level of the global workforce without access to "value-added" information in the New Economy is described herein as "*Those At Risk.*" To protect Those At Risk, the information society must be regulated with the goal to even out the imbalance of access to information, while at all times maintaining protection of individual rights and inventors' intellectual property. The term "regulation" is used herein generically to refer to the prescriptive nature of the rule of law. (The term does not mean 'regulation'

97. Hanad, *supra* at 16-17.

by government agencies in the administrative or public law system of the United States.)

This part of the Article will first outline a general policy framework for regulating the Knowledge Economy. It will then identify some of the obstacles and challenges in the existing legal system that may block the prospect of successful uniform global regulation. The limited scope of this Article precludes (ii) the over-ambitious task of proposing a specific new regime of global legislation, as such is a long-term 21st century project; or (ii) an exhaustive and detailed summary or critique of current national, supranational, or multilateral regimes. This Article will only identify the needed regulatory aspiration, as well as some of the underlying policies, tension, and conflicts in the current legal system that must be overcome for any kind of meaningful global regulation to take place. Hopefully, this will set the stage for further scholarly discussions, saved for another day.

General Policy Framework for Regulating the Knowledge Economy. "Knowledge" is the driving factor of the New Economy, of which AI is one of the most advanced aspects. To economists, "Knowledge" is an endogenous production factor.[98] The widened gap in "Knowledge" among segments of the global workforce is described as the "cognitive divide,"[99] which can occur not only between North and South but also within any country.

In the domain of law, this problem calls for regulatory solutions. To accomplish this objective, it is important to understand the nature of "Knowledge" as a strategic resource, and how this resource is managed by corporations.

The Knowledge that is useful for the New Economy does not just consist of scientific knowledge, nor the inert knowledge that one can find on the Internet. This endogenous "production factor" or strategic resource should combine *four* types of knowledge **: (I)** pure scientific and/or technical knowledge and related methodologies, including elements such as software and hardware knowledge; **(II)** know-hows, referring to knowledge arising from culture, context, utilization, employment, or tasks, which enables the application of type I knowledge;[100] **(III)**

98. Knowledge has always been recognized by earlier economic philosophers such as Adam Smith, John Stuart Mill, or Karl Marx. But, in earlier days, Knowledge was characterized as human ingenuity, and technical progress that resulted from Knowledge was considered an exogenous factor (similar to natural resources given by nature). It was only in recent decades that Knowledge was acknowledged as an endogenous factor – the result of a production process, rather than that which is given by nature.

99. On the role of cognitive factors in the process of economic change, see Douglas North: Understanding the Process of Economic Change (Princeton University Press 2005). *See also* Bernard Paulre, Introduction au Capitalisme Cognitif (Matisse ISYS University de Paris 2005).

100. S*ee N*ote 191, *infra (*definition of Know-How).

factual data and information relating to any topic of discussion or inquiry -- that which may be contained in a database or an encyclopedia (the handling of which constitutes the activities called "TIC" (Technology of Information and Communication); and **(IV)** relational knowledge -- that which enables the source of expertise, information, know-hows, and data.

These four types of Knowledge form the competence of an individual or an organization – the result of education, training, working, family and cultural environments. They are intimately mixed in the complex process of learning by doing, usage, and interaction (i.e., working with others or being part of society). Economists call Knowledge a "non-rivaled public good.[101] "Public" refers to the fact that the goods can be used simultaneously by several people, and can be transferred to others without denying its owner the right to enjoy its benefit (i.e., the foundation of intellectual property rights). "Non-rivaled" means that public use of the goods will not create what economists call a "congestion" or bulk" condition. For example, the Golden Gate Bridge qualifies as a public good shared by many users, but at certain time of the day, usage by too many people will cause a traffic jam. In contrast, massive use of Microsoft Window, an intellectual property, will not cause such a "congestion" or 'bulk" condition. A "non-rivaled public good" will not be depleted by usage or consumption; to the contrary, it can only be improved upon via mass usage and a network effect. AI or Microsoft Windows software is such a "non-rivaled public good" used by billions of people simultaneously without damage, destruction, depletion, or congestion. In fact, massive usage of Knowledge-based products will improve the goods via user experience and remarks.)

Hence, as an economic production factor, Knowledge can be lasting, self-produced, and unlimited because it comes from the human mind. Regulation of the Knowledge Economy, therefore, must focus on the production factor of Knowledge, and must aim at restoring or consolidating its nature as a "non-rivaled public good," including making the necessary adjustment to the way this strategic resource is appropriated and exploited. Such a condition should be based on the total concept of "development," which should be global, sustainable and equitable. In other words, regulatory policies must focus on

101. Edmond Malinvaud, Leçons de théorie microéconomique at 223-224 (Dunod 1986); Jean-Jacques Laffont, Fondements de l'économie publique at 39 (Economica 1988) ((English version : Edmond Malinvaud, Lectures On Microeconomic Theory (North Holland 1985); Jean-Jacques Laffont, John and Helene Bonin, Fundamentals of Public Economics, MIT Press, 1988)). *See also* Daniel Cohen, Richesse du monde et pauvretés des nations at 61 (Flammarion 1997).

the total development of humans.[102] The whole movement of Sustainable Development has evolved out of its environmental law boundaries to enter the domains of international law and global economic development. Development must allow future generations of humans to be able to sustain themselves.

But the reality is quite different. Although corporate behaviors do confirm that "Knowledge" is such fundamental production factor, these behaviors are at odds with concepts of "Development" and "Sustainability." The way corporations manage to appropriate and exploit Knowledge as a strategic resource can cumulatively induce a "cognitive divide." It is this "cognitive divide" that causes the division of labor identified herein. Hence, effective and equitable global regulation must therefore address the following *three* trends of corporate behaviors:

(1) Since Knowledge cannot be stocked on shelves like commodities, but must be integrated into individuals, corporations will design sophisticated recruitment policies to capture the most capable and knowledgeable individuals. The multinationals are financially equipped to do this. These recruitment policies do not necessarily focus on total development, but instead, are profit-specific, and hence can be one-dimensional. This is also the source of the "brain migration" problem leading to the accumulation of cognitive resources where they are already abundant, worsening an already imbalanced division of labor.

(2) Corporations will also build up cooperative network between industrialists, research laboratories, universities, and inventors in order to produce the specific type of Knowledge corporations would need for their profit-making activities. This is the source of the "selection and competition" problem. The best network attracts the best individuals and rejects those incapable of producing the right cognitive resources. I call this phenomenon "informational or knowledge-based Darwinism."

(3) The only way corporations will share this strategic resource is via the "licensing" mechanism, a legal process, which may confer a monopoly upon the marketplace of intellectual property. This may lead to a concentration of cognitive and financial power that can control the entire "key-enabling" sector of the economy.

Global regulatory solutions, therefore, should aim to act on the nature, and at the source of, the production and accumulation of this new strategic resource called Knowledge.

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102. *See* Note 234, *infra* (definition of Sustainable Development).

Overall Deficiency of the Present Regulatory System. Currently, there is no coordinated system of global regulation to address specifically the potential new labor division or the imbalanced accumulation of Knowledge identified in this Article. While current regional law systems contain some general protection for the workforce and other measures to enable international distribution of technology, such general protection was not created with this new division of labor or concentration of cognitive capitalism as the prime regulatory objective. In other words, in the absence of a contractual agreement, no one has a "human right, "civil right," or "labor right" not to have his/her job replaced or displaced by a computer, nor is there a global standard telling employers not to do so in making their business decisions. Yet, not everybody has the privilege of acquiring information or Knowledge in order to control, develop, understand, or manipulate such a computer or the network to which it belongs.

Considering the interest of Those At Risk, the current international legal system suffers from *three* main drawbacks.

- *First*, the need for, and success of, uniform global regulation must rest on worldwide consensus in international policy-making. Yet, the political differences between North and South have never completely dissolved, despite the rapid rate of economic globalization, which occurs simply as a result of market forces. There exists continuing tension between (i) market theory as the foundation for lawmaking (the "Economics" school), and (ii) the law-morality nexus as the impetus for lawmaking (the "Morality" school). The need for global regulation of the information society to protect Those at Risk has its philosophical roots in both Economics and Morality – the law has a moral dimension to promote human dignity, and not just a function of economic competition.[103] At the same time, regulating the information society may contradict the "neo-liberalist" pro-market theory that promises deregulation and champions free trade as the means to provide worldwide growth and development.[104] This is part of the reason why the reaching of consensus in global lawmaking has been relatively slow and difficult to achieve.

- *Second*, despite globalization, the current legal system still points to the dominance of national sovereignty over the need for uniformity and universality. The continuing use of national borders to determine rights and privileges for humans will create and perpetuate the imbalance and inequity in

103. BOB HEPPLE, LABOUR LAWS AND GLOBAL TRADE 13 (2005).
104. JOSEPH E. STIGLITZ, GLOBALIZATION AND ITS DISCONTENTS 59 (2003).

access to information. Global efforts must continue to harmonize and equalize *all* variations among national laws, which so far has been an impossibility due to divergent (and conflicting) national interests.

- *Third,* where some form of global regulation is already in force, it seeks to protect technology inventors and producers and not necessarily Those At Risk. Or, it lacks enforcement teeth, and is not specifically equipped to address the potential "ghetto'ing of the workforce" discussed in this Article. Ideally, international law-drafting institutions need to review existing international legal regimes, with the goal to incorporate specific protection for Those At Risk.

In other words, the current system, which assumes that free trade serves the interest of the underprivileged, should undergo scrutiny from a different perspective, one that takes into consideration the new division of labor and digital work environments explored in this Article. Such review and formation of new global regulations should encompass, at a minimum, the following areas of law: intellectual property (IP), labor, antitrust/anti-competition, technology transfer, and multinational corporate behaviors, in addition to the harmonization of national laws.

The following demonstrates the drawbacks of the current legal system identified above.

Formation of International Economic Law. Assessment of the current situation will require an understanding of the formation of modern international economic law. Our current international law system allows *two* ways by which global economic regulation can be formed.

(i) The "treaty or convention" format -- regulation by consensual international agreements among nations as signatories, either bilaterally or multilaterally; and/or

(ii) The "private deal/*lex mercatoria*" format -- regulation by voluntary code of conducts, and by private agreements negotiated among private parties, or between governments and the private sector in private deals, as a way of "codifying" or setting norms of practice.

Both methods require consensus building and compromise of interests, at "country" level as well as "firm" level, and can involve unequal bargaining power, thereby making the process, and any equitable result deriving therefrom, quite difficult to attain.

- **First Method of Forming International Economic Law: International Agreements.**

Below is a summary discussion of current international agreements addressing the areas of law that must be reviewed and revised to include specific protection of Those At Risk. This summary discussion demonstrates that save and except the success of regional economic groupings, national sovereignty and national interests dominate regulatory policies. This leads to the failure of global uniformity or universality, causing tension between the internationalized distribution of technology and the need to stimulate inventions by protecting inventors and capital owners.

(a) Existing global protection of intellectual property rights (IPR). Global protection of IPR – patent, trademark, and copyright – is addressed in a number of international agreements, including principally:

--the 1970 Patent Cooperation Treaty (PTC);

--the European Patent Convention and the European Union Patent Convention (the only treaty that grants something like a single international patent valid throughout the EU);

--the Trademark Law Treaty (TLT);

--the 1973 Vienna Trademark Registration Treaty;

--the 1957 Arrangement of Nice Concerning the International Classification of Goods and Services (addressing international trademark);

--the 1883 Convention of the Union of Paris ("Paris Convention," administered by the International Bureau of the World Intellectual Property Organization (WIPO)) (addressing both patent and trademark);

--the 1891Madrid Agreement for International Registration of Marks (as amended), and the related 1989 Madrid Protocol;

--the 1886 Berne Convention (addressing copyright);

--the 1952 Universal Copyright Convention (UCC);

--the 1902 Mexico City Convention and the 1911 Buenos Aires Convention for Latin America (addressing copyright);

--the 1996 WIPO Copyright Treaty;

--The North American Free Trade Agreement (NAFTA) (addressing all three areas of IP); and

--the Trade-Related Aspects of Intellectual Property Rights (TRIPS) as part of the WTO-GATT framework (addressing all aspects of IP).

In general, rather than imposing one set of substantive standards to be enforced transnationally, the IP international agreements either incorporate "*national treatment*" (i.e., the first country will grant to the second country's

citizens what the first country grants to its own citizens) or "*reciprocity*" (i.e., the first country will grant to the second country's citizens what the second grants to the first). In other words, these agreements preserve and apply the national standards based on sovereign consent. For example, although TRIPS and NAFTA both set some minimal standards that represent transnational norms on all three areas of IPR, these agreements also incorporate and honor national treatment.[105]

Further, not all of these treaties and conventions are self-executing, and, as a common feature of the consensual treaty schemes, signatories can opt out of specific provisions by making declarations and/or filing reservations.[106] In general, IPR protection remains by and large a matter of national laws and enforcement systems, which also vary according to cultural and other sociological issues unique to a particular society. For example, in certain Eastern cultures, there is no "guilt" attached to the public's use and duplication of IP, partly due to the cultural view that IP is considered a public utility and treasure for the enjoyment of mankind.[107]

But more importantly, these agreements primarily put emphasis on IPR protection, taking into consideration the interest of the creator, inventor, or

105. See Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, art. 1, Legal Instruments - Results of the Uruguay Round vol. 31, 33 I.L.M. 81 (1994) [hereinafter TRIPS]; North American Free Trade Agreement, 32 I.L.M. 612, signed Dec. 17, 1992 [hereinafter NAFTA].

106. The "Summary of Practice of the Secretary-General as Depositary of Multilateral Treaties," United Nations Treaty Collection ("Summary"), *found at* http://0-untreaty.un.org.pacman.law.du.edu/English/Summary.asp, contains the following definition of "Declaration":

"*Declarations, however they may be known (communications, interpretative declarations, understandings, etc.), either made at the time of signature or at the time of deposit of a binding instrument, are to be distinguished from reservations in that they do not purport to exclude or modify the legal effects of the treaty. -The purpose of declarations is rather, in principle, to make more explicit the meaning of a particular provision. However, declarations are made in a political context - for example, to express satisfaction at the adoption of the treaty, or to express regret that a provision has not been included in the treaty and the hope that through an amendment it will be in the future, or to express dismay that a provision has been included which the State concerned finds offensive. While declarations are usually made at the time of the deposit of the corresponding instrument or at the time of signature, they are sometimes made in contemplation of the impending signature of the treaty, after its adoption, and the text of such declarations is then frequently reproduced in the Final Act of the Conference that adopted the treaty*."

Chapter VIII of the Summary incorporates verbatim the definition of "reservation" from Paragraph 1 (d) of article 2 of the Vienna Convention on the Law of Treaties, which restates established customary international treaty law on the matter. The Vienna Convention defines the term "reservation" as follows:

'Reservation' means a unilateral statement, however phrased or named, made by a State, when signing, ratifying, accepting, approving or acceding to a treaty, whereby it purports to exclude or to modify the legal effect of certain provisions of the treaty in their application to that State."

107. For an example of national protectionism and cultural impediments to the internationalization of patents, s*ee, e.g.,* Liwei Wang, The Current Economic and Legal Problems Behind China's Patent Law, 12 Temp. Int'l & Comp. L.J. 1, 34-40 (1998). *See also* William P. Alford, TO STEAL A BOOK IS AN ELEGANT DEFENSE: INTELLECTUAL PROPERTY LAW IN CHINESE CILIVIZATION (1995) (exploring, *inter alia*, the relationship between law and cultural attitude in china in the context of IP law),

technology producer, rather than the recipient host country in a technology transaction. One such typical transaction is the "licensing agreement," whereupon the international technology producer will license the invention to the host country or local partner at a cost. An examination of TRIPS will exemplify this producer-protection tendency and characteristic. NAFTA overlaps substantially with TRIPS with respect to IPR. [108]

TRIPS, perhaps the closest form to global IPR regulation, focuses on the interface between free trade and IPR protection, which previously was the domain of the World Intellectual Property Organization (WIPO). In general, TRIPS is viewed as an international commitment that champions the views of the developed nations for the international protection of IPR, led by the United States.[109] By way of the Uruguay Round Agreement Acts of 1994, the U.S. was deemed as having ratified and implemented TRIPS, which took effect in 1995 although negotiation began in 1987 with the GATT Uruguay Round. TRIPS was generally considered the externalization of the U.S.' IPR standards and, accordingly, required little change in U.S. law.

Major concessions made by TRIPS for the developing economies consisted of the following: TRIPS acknowledge a "public order" or "public policy" exception from patentability (*ordre public),* arming the developing countries with an "escape clause" out of their patent commitments. The other concession for the developing and least developed economies came in the form of exemptions or giving them grade periods before they became obligated to the terms of TRIPS.[110]

Part III of TRIPS specifically sets out obligations of member states to provide criminal, civil, and administrative procedures and remedies under their domestic laws to ensure that the IPRs of foreign holders and nationals are effectively enforced.[111] However, part of TRIPS' objective is also to reduce impediments to international trade caused by national IP protection.[112] Because

108. **TRIPS, developed as the next "IPR protection" generation of NAFTA, imposes mandatory patent coverage** in all areas of technology, protects computer programs and databases, and prohibits the discrimination by national laws in compulsory licenses on the basis of whether the patented product is locally produced or imported. TRIPS, PART II, Sections 5, 8. *Accord* Correa at 2657; *compare* R. Folsom and W.D. Folsom, Understanding NAFTA and Its International Business Implications, Chapter 8 (1996).

109. *See* President Clinton's Submission to Congress of Documents Concerning Uruguay Round Agreements (Dec. 15, 1993), 58 Fed. Reg. 67289 (1993); Pechman, Seeking Multilateral Protection for Intellectual Property: the United States "TRIPS" Over Special 301, 7 Minn. J. Global Trade 179 (1998).

110. **TRIPS, Arts. 27(2), 65 and 66.**

111. **TRIPS, PART III, Sections 1-5.**

112. **Preamble to the Agreement on TRIPS;** *accord* Abdul Ghafur Hamid, The Law of the World Trade Organization: An Analysis from International Law Perspective, 1 Asian J.Int.L. Vol.1 Issue 1, at 8 (June 2006).

the philosophical behind TRIPS is to encourage and facilitate a free flow of technology transfer by way of free trade, TRIPS' goal may legitimately be construed as aiding all segments of the global workforce to receive and benefit from technological know-how's, while protecting IPR holders. For example, Section 8.2 of TRIPS controls anti-competitive practices in voluntary licensing that "*may have adverse effect on trade and may impede the transfer and dissemination of technology*."[113]

Specifically, under Section 40.2 of TRIPS, the following types of licensing provisions are considered prohibited anti-competitive, restrictive practices:

(i) Provision that obliges the licensee to transfer locally produced improvements of the invention back to licensor;

(ii) Provision that prohibits the licensee from challenging the validity of the licensed right; or

(iii) Provision that obliges the licensee to acquire from the licensor technologies or input that the licensee does not desire (a practice called "coercive packaging").[114]

Note that in general, Section 40.2 only enables national laws; it does not create an internationally agreed rule of what an anti-competitive practice is. Deference is still given to national standards.

In summary, although stronger and wider protection of IPR, nationally, regionally, or globally, will eventually stimulate local innovation, such innovation will occur only if a certain level of technological development has been achieved in the local economy. It is believed that protecting and strengthening IPR will encourage technology producers to license technology to the local market in order to help build such bottom-level technological development for the local population. Yet, even though IPR safeguards are in place, laws governing the technology transactions still depend on national sovereignty (except in the EU, where there is supranational power and consensus).[115] If the recipient country does not have effective technology

113. TRIPS, PART II, Section 8, Art, 40.1.

114. TRIPS, PART II, Section 8, Art. 40.2.

115. The focus of EU technology transfer regulation comes principally in anti-competitive laws, including (i) Articles 81, 85 and 86 of the Treaty of Rome (*see* Treaty Establishing the European Economic Community, Mar. 25, 1957, art. 85-87, 298 U.N.T.S. 11 [hereinafter Treaty of Rome]), and (ii) the Common Market rules of competition such as the Exclusive Distribution Regulation, the Exclusive Purchasing Regulation, the Block Exemption Regulation relating to Patent Licensing Agreements, the Joint Research and Development Regulation, and the Block Exemption Regulation relating to Know-How Agreements. *See, generally,* Mark Joelson, An International Antitrust Primer 2d Edition at 1-7 (Kluwer 2001) (guide to U.S., EU and other key competition laws in the global economy). *See also* Commission Regulation 2790/1999 On The Application of Article 81(3), O.J.L. 336/21 (Dec. 29, 1999) (Vertical Restraint Regulation); Commission Regulation (EC)

transfer law, the technological development of the host country is still a function of market forces and the bargaining power of contractual parties to negotiated technology transactions, which vary from case to case. As demonstrated below, efforts made at achieving a global technology transfer code to provide uniformity as well as a "Third World" perspective, has failed.

(b) The unfinished global projects: Unsuccessful efforts at uniform regulation via global codes. In the 1970s, industrialized and developing countries got together to negotiate an International Code of Conduct for the Transfer of Technology (TOT). Other negotiations also took place to revise the Paris Convention regarding IPR protection,[116] and to formulate a Restrictive Business Practice (RBP) code for antitrust.[117]

TOT was prepared within the framework of UNCTAD, as part of the New International Economic Order (NIEO).[118] Since NIEO was based on the "universal heritage argument," as stated in TOT's preamble, the draft code put forth the concept of "distributive technology" as a treasure and collective knowledge that should be shared toward the goal of true "economic equality in the world."[119] This rather "romantic" notion of technology transfer dated back to the myth of Prometheus, who stole fire from Olympus and brought it down to man. In modern time, IPR protection has developed as a matter of economic efficiency and necessity, whereas technology transfer can be regarded as a notion of distributive justice.[120]

No. 772/2004 of 27 April 2004 on the Application of Article 81(3) of the Treaty to Categories of Technology Transfer Agreements, 2004 O.J. (L 123) 11. These agreements help delineate the interplay between intellectual property rights and antitrust laws.

116. **Some eleven technology supplier countries signed the Paris Convention for the Protection of Industrial** Property in 1883. It serves two functions: (i) protection of inventors; and (ii) establishing guidelines for national patent laws to facilitate the international diffusion of new technology. If a country seeks technology, it must play by suppliers' rules and provide adequate protection of patents under national laws. Proponents for the revision of the Paris Convention argued that the patent system accounted for monopolies that held captive the developing markets. SUSAN K. SELL, POWER AND IDEAS, NORTH-SOUTH POLITICS OF INTELLECTUAL PROPERTY AND ANTITRUST at 106-110 (Suny Press 1998).

117. **Other related projects at the U.N. level included (i) the U.N. Conference on Science and Technology** for Development (NCSTD); and (ii) UNIDO's "Guidelines for the Acquisition of Foreign Technology in Developing Countries with Special Reference to Technology License Agreements." Wolfgang Fikenscher, IIC Studies in Industrial Property and Copyright Law, Vol.4, The Draft International Code of Conduct on the Transfer of Technology at 11 (1980); United Nations Publications, Sales No. E. 73. II. B. 1 (April 1973).

118. **Discussions that led to the draft TOT took place even prior to the NIEO movement. Golfgang** Fikenscher, IIC Studies in Industrial Property and Copyright Law, Vol.4, The Draft International Code of Conduct on the Transfer of Technology at 11 (1980).

119. **Wolfgang Fikenscher,** *Id.* at 22 (1980).

120. **The U.S. approach to IP – conditioning the granting of GSP status to foreign nations upon their national** law's adequate protection of IPRs for U.S. businesses (see relevant discussion in Part VI.A (d) *infra)* – reflects the sentiments of its corporate constituents. "T*he notion that IP should be treated as heritage of mankind assaults the basic morality of good business*." Larry Evans, "Licensing Disincentives in Brazil," Les Nouvelles Vol. XXI, No. 4, p. 183 (December 1986) (quoting Standard Oil Chairman).

The impetus for TOT actually came from the "Group of 77" representing the South, who expressed the need to exert great national control over technology transfer in order to reduce their dependence on foreign suppliers' overpriced technology.[121] The developing nations' voices paralleled certain studies done by governmental organizations of the Americas, which revealed "abuses" of Latin countries, whose technological development was made completely dependent upon external decision-making and control as part of what they had to give in technology transfer arrangements. These studies led to a wave of restrictive technology transfer laws by the Latin American states, as part of their interventionist mechanisms to regulate their severe balance-of-payment economic crises.[122] But even with these protectionist laws, bargaining powers remained unequal due to the inexperience of the new government technocrats charged with the review and approval of licensing and related agreements: technology producers ended up knowing far more about their capabilities as well as the nation's industrial needs. Even with the force of national laws, governments might still have to waive, relax, or abolish those legal requirements depending on how badly the nation needed technology.[123]

TOT thus recognized national sovereignty and its power to regulate technology transfer contracts and transactions.[124] This feature of TOT has been criticized as ambiguous: does the provision intend to enable just recipient countries, or supplying countries, or both?[125] Not only did recipient countries have an interest in enacting technology transfer laws, but the technology supplying countries also wanted to exercise their sovereign power extraterritorially to control the export of technology from their territory, based on national defense, national security, and foreign policy concerns. The draft also addressed restrictive business practices in technology transactions – the interplay between antitrust and technology transfer framework -- by giving special treatment to the developing countries under antitrust rules to help them strengthen their bargaining power in technology transactions.

Against such backdrop, the TOT became the battleground for North-South international politics: the South wanted technological development at

121. SUSAN K. SELL, POWER AND IDEAS, NORTH-SOUTH POLITICS OF INTELLECTUAL PROPERTY AND ANTITRUST at 66-70 (Suny Press 1998).
122. *See, e.g.*, Radway, Antitrust, Technology Transfers and Joint Ventures in Latin American Development, 15 LAWYER AM. 47 (1983).
123. **Sell,** *supra,* note 120.
124. *Id.* at 159 (Annex I [Draft TOT Code].
125. *Id.* at 63-64.

a price it could afford to pay, viewing technology was part of the patrimony of mankind. The North treated the value of technology as private property, and traditionally have been reluctant to part with "core" or "critical asset" technology.

The TOT project failed eventually, with the breakup of Group 77, the initiator of the NIEO movement.[126] In the end, only TRIPS serves the function of an international code. Each developing nation is left to design its own FDI, antitrust, and technology transfer law and policy under the current multilateral system. Since the failure of TOT, the watchdog of technology transactions has remained a matter of national border differentiation and stages of development (other than EU's regionalism), with all of the drawbacks inherent in national interventionist mechanisms. In technology transfer, the dialogue remains divergent: the North advocates a minimal role for governments while the South prefers an interventionist role. If economic liberalism prevails, technology transfer in today's globalization will continue to be market-led – the natural law of the market will provide the result, and this is where the danger occasioned by AI remains unchecked.[127]

The poor record of negotiation between North and South also led to failures of other related global projects, made worse by the South's macroeconomic crises that lessened their unity and bargaining power throughout the past decades. For example, technology issues can also indirectly be regulated via the enforcement of multinationals' codes of conduct. So far, this ongoing global project of equally complexity and difficulty has not been successful.

Global efforts to regulate multinationals' conduct paralleled the TOT project, starting in 1974 with the formation of the Intergovernmental Commission on Transnational Corporations, an advisory body to the U.N. Economic and Social Council (ECOSOC). This Commission was assisted by the Center of Transnational Corporations (CTC) in New York. The U.N. Code of Conduct governing multinational corporations came as the second stage of ECOSOC efforts, separate from efforts made by the International Labor Oorganization (ILO) in Geneva, the OECD, the European Parliament, or other intergovernmental groupings in the Americas.[128] More recent global

126. *Id.* at 105-06.

127. *Id.* at 76-77.

128. *See* U.N. Comm'n on Transnat'l Corp., Draft United Nations Code of Conduct on Transnational Corporations, 23 I.L.M. 626 (1984); OECD Guidelines for Multinational Enterprises (Revision 2000), http://www.oecd.org/dataoecd/56/36/1922428.pdf.; Draft Code of Principles on Multinational Enterprises and Governments, 20 O.J. Eur. Comm. (No. C 118) 16 (1977); Fitkentscher, *supra,* notes 60 & 61 (citing to efforts

projects addressing conduct of multinationals have included the United Nations' Global Compact, and more recently, the 2003 adoption by the UN Sub-Commission on the Promotion and Protection of Human Rights of the "Norms on the Responsibilities of Transnational Corporations and Other Business Enterprises with Regard to Human Rights"[129]

All of these global projects were all closely related to, or arose under the largest context of, the NIEO movement of the past century, which unfortunately has become a cliche. Another unfinished global project where the regulation of technology issues can be shaped and formed is the OECD's proposed Multilateral Agreement on Investment (MAI). Representing the voice of the industrialized nations within the OECD, the MAI may be the project least influenced by the wake of the NIEO movement and its aftermath. The future of all of these projects, specifically the prospect of revitalizing the failed TOT, remains uncertain.

(c) Lack of universal antitrust and anti-competition laws, other than under regional framework. In philosophical principles, the notion of technology transfer undermines IPR protection, which in effect grants inventors a monopoly right over their inventions. The relationship between technology transfer and anti-competition policies, therefore, is evident. The possession of technology creates considerable market power,[130] calling for effective measures to avoid abuses. In a regulatory framework, IPRs must be tempered against antitrust and restrictive business practices, whereas competition policies must respect IPRs, stimulate innovation and ensure fair dealings in technology transactions.

As with other parts of the law, rules against monopoly and anti-competition activities are generally still a matter of national sovereignty to protect the local market. Actions must be taken by national sovereignties to protect their respective markets.[131] Their initiative and the sophistication of their laws will depend on their stage of development. In sum, there is no

made by the Andean Subregional Organization and the Organization of the American States in the 1970s to address multinationals' behavior).

129. THE UNITED NATIONS GLOBAL COMPACT: ADVANCING CORPORATE CITIZENSHIP (prepared by the Global Compact Office June 2005); Michael Trebilcock & Robert Howse, Trade Policy and Labor Standards 14 MINN.J. GLOBAL TRADE 2 61, 275-76 (2005).

130. Large cross-border mergers and acquisitions (M&A) in the industrialized economies evidence the trend for concentration of technology ownership. FDI statistics released by the OECD show that in 2006, the level of FDI in OECD countries included a number of large cross border M&A's. *See* http://www.OECD.org/dataoecd/62/43/38818788.pdf.

131. *See, .e.g,* Mark Joelson, An International Antitrust Primer 2d Edition at 1-7 (Kluwer 2001) (guide to U.S., EU and other key competition laws in the global economy).

single universal antitrust model, although efforts have been made, first by the WTO predecessor, the International Trade Organization (ITO),[132] then by the OECD,[133] and finally by UNCTAD, which adopted a non-biding code to control restrictive anti-competitive practices.[134] The only exception has been the extent to which regionalism has successfully taken place, as in the case of NAFTA or EU regimes. In the case of the EU, regional merger control guards against restraining or anti-competitive practices to assure common market protection.[135] NAFTA, on the other hand, commits each nation to national enforcement of antitrust law, but, as a free trade zone and not a common market, NAFTA does not create regional law on anticompetitive practices as in the case of the EU).[136]

Intense debates have taken place between those who advocate for an international regime and those who wish to maintain national regimes. For example, the EU has traditionally favored a global regime, whereas the U.S. has opposed such an approach.[137] More recently, scholars have tabled a Munich Draft Code,[138] and the WTO has issued mandates for the study of antitrust and its interaction with trade policies.[139] Both the OECD and the WTO have dropped their respective initiatives. The current ongoing "harmonization" project is that of the International Competition Network (ICN), a coalition of nongovernmental advisors and antitrust agencies from the founding sovereignties.[140]

The developed jurisdictions, on the other hand, have set out to give extraterritorial effect to their domestic antitrust laws, a self-help approach to internationalization, with each superpower turning itself into the anti-trust

132. D. Daniel Sokol, Monopolists Without Borders: The Institutional Challenge of International Antitrust in a Global Gilded Age, 4.1 Berkley Bus. L.J.38, 47-48 (2007), Univ. Wisconsin Law School Legal Studies Research Paper Series, Paper No. 1034 (Feb. 2007), *found at* http://ssrn.com/abstract=961380 (Social Science Research Network Electronic Paper Collection).

133. *Id.*

134. UNCTAD, Set of Multilaterally Agreed Equitable Principles and Rules for the Control of Restrictive Anticompetitive Practices, TD/RBP/CONF/10/REV.1 (Geneva: UNCTAD, 1980) (the "RPP Code").

135. 1989 EU Mergers Regulation, Council of Ministers Regulation 4064/89 on the Control of Concentration Between Undertakings (September 21, 1989). *See also* Ralph Folsom, European Union Law in A Nutshell, Chapter 7 (2004); Reynolds, the Future of Merger Control in Europe, 26 Int. Bus. Lawyer 100 (1998); Gilchrist, Procedures in Merger Cases, 26 INT. BUS. LAWYER 113 (1998). For EU streamlining of corporate law, see, e.g., Council Regulation on the Statute for a European Company [European Union Societas Europeae] (SE) No **2157/2001** of 8 October 2001, art. 2, O. J. (L 294).

136. North American Free Trade Agreement, U.S.-Can.-Mex., ch. 15, Dec. 17, 1992, 32 I.L.M. 605, 663 (1993). *See also* Mark R. Joelson, *Antitrust Aspects of NAFTA*, 40 Fed. Bar News & J. 573 (1993).

137. Mark Joelson, An International Antitrust Primer 2d Edition at 1202-03 (Kluwer 2001) (guide to U.S., EU and other key competition laws in the global economy).

138. 64 Antitrust & Trade Reg. Rep. (BNA) (August 19, 1993).

139. *See e.g.,* Working Group on the Interaction between Trade and Competition Policy, Draft Report (1997) to the General Council, WT/WGTCP/W/49 (Nove. 25, 1997).

140. Sokol, *supra*, at 15-123. The founding members are: Australia, Canada, the EU, France, Germany, Israel, Italy, Japan, Korea, Mexico, South Africa, the U.K., the U.S., and Zambia.

enforcer of the world.[141] For example, the U.S. exerted its extraterritorial antitrust law in order to break up an international uranium cartel, causing, European countries and Canada to enact "blocking statutes" to limit the U.S.' long arm in litigation.[142] Similarly, the EU also gives extraterritorial effect to its antitrust system by applying, *inter alia*, a jurisdictional threshold "turn-over test" (in Euro) that signifies the impact of mergers upon the common market, even if those mergers do not take place in the EU or initiated by EU citizens.[143] Both the EU and the U.S. unilaterally claim an "effect" test for exercising prescriptive antitrust jurisdiction extraterritorially. Once more, these extraterritorial exertions of national laws and the "blocking statutes" they generated prove that national sovereignty continues to prevail over the globalization of law.

It follows, therefore, that a major monopolistic actor in the global scene is the sovereign state itself, acting allegedly in the national interest, notwithstanding WTO members' obligation to administer measures affecting trade in "a reasonable, objective, and impartial manner."[144] Sovereign power existing in customary international law and exercised via domestic law generally protects governments who engage in anticompetitive acts. For example, under both U.S. and EU laws, foreign governments enjoy immunity from antitrust liability and benefit from the Act of State doctrine that precludes judicial inquiries into the validity of governmental actions.[145] Most antitrust conflict-of-law issues have been resolved by ad hoc bilateral agreements, or by informal cooperation between governmental agencies.[146]

141. D. Daniel Sokol, Monopolists Without Borders: The Institutional Challenge of International Antitrust in a Global Gilded Age, 4.1 Berkley Bus. L.J.38 (2007), Univ. Wisconsin Law School Legal Studies Research Paper Series, Paper No. 1034 (Feb. 2007), *found at* http://ssrn.com/abstract=961380 (Social Science Research Network Electronic Paper Collection).

142. *Id.*

143. *See* Note 135, *supra (*discussing EU merger control law). Sokol, *supra.* at note 20 and 21. *See also* Edward T. Swaine, the Local Law of Global Antitrust, 43 WM. & MARY L.REV. 627, 641-46 (2001).

144. *See, e.g.,*General Agreement on Trade in Services (GATS) Art. VI ("*In sectors where specific commitments are undertaken, each Member shall ensure that all measures of general application affecting trade in services are administered in a reasonable, objective and impartial manner*").

145. See these doctrines summarized in U.S. DOJ-FTC, Antitrust Enforcement Guidelines for International Operations (April 1996); Opinion of Advocate General Fennelly Delivered on 29 October 1998, Joined Cases C-395/96 P and C-396/96 P Compagnie Maritime Melge NV and Dafra-Lines v. Commission of the European Communities. *Accord* Foreign Sovereign Immunity Act, 28 U.S.C. § 1604; Restatement (Third) of the Foreign Relations Law of the United States § 443 (1987) (act of state doctrine).

146. For example, in 1982, the U.S. and Australia executed the Agreement on Cooperation on Antitrust Matters. See Note, The United States-Australian Antitrust Cooperation Agreement: A Step in the Right Direction, 24 VIR. J. INT. L. 127 (1983). *See also* Griffin, EC and U.S. Extraterritoriality: Activism and Cooperation, 17 FORDHAM INT.L.J. 353 (1994); *accord* Griffin, EC and U.S. extraterritoriality: Activism and Cooperation, 17 Fordham Int.L.J. 353 (1994). For US-UK conflict on antitrust enforcement, see Kahn, The Protection of Trading Interest Act of 1980: Britain's Response to U.S. Extraterritorial Antitrust Enforcement, 2 NORTHWESTERN J. INT. L. & BUS. 476 (1980). *Accord F*olsom, Gordon and Spanogle, International Business Transactions 2d (West Hornbook series 2001). *See also* OECD, Revised

(d) <u>The fallacy of international labor protection</u>. Likewise, the current international labor law regime is not equipped to protect worker welfare in the AI revolution with "digital" work environments that streamline the production lines. Labor and employment law, or workplace regulation, has traditionally been domestic. An "employment at will" model such as the U.S. system preserves unfettered employer power and prerogative, and provides no protection against downsizing and layoffs or other job displacement in the workplace (except for what is provided in private contracts, union collective bargaining, and/or employers' internal rules).[147]

At the same time, globalization may have created a "race to the bottom" among nations to relax national labor standards in order to maximize their comparative advantages -- one recent study found that U.S. multinationals prefer to locate in countries with decentralized bargaining and few restrictions on layoff. [148] As illustrated below, there is no enforceable international labor code that can be universally applied, although inspirational international labor legal standards are embodied in both private and public international law (the "Private Code" versus the "Public Code").

The Private Code is the product of private actors (or governments as parties to commercial deals), since private international labor law can be formed via negotiated private agreements and voluntary codes of conducts (to be described later in this Article). The Public Code, or public international labor law, consists of (i) U.N. human rights declaration and covenants, (ii) labor provisions in trade-related international and regional agreements, and (iii) declaration, conventions

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Recommendation c(95)130/Final Concerning Cooperation Between Member Countries on Anticompetitive Practices Affecting International Trade, 35 I.L.M. 1313, 1315 (1996) ("Member countries should cooperate in the implementation of their respective national legislation in order to combat the harmful effects of anticompetitive practices . . . .").

147. Article 67 of TRIPS, on the other hand, imposes generally upon WTO member states a duty to provide "technical and financial cooperation in favor of developing and least-developed country Members… including the training of personnel." It is not clear what "training" or "technical cooperation" refers to. The language of Article 67 is not specific enough to be extended to issues of workforce training, use or transfer of technology, or digital work environments. It is possible that "training" refers to the Member State's obligation to enact and enforce national laws regarding IPR protection, if read in context. Article 67 states, in part, that *"[s]uch [technical] cooperation **shall include** assistance in the preparation of laws and regulations on the protection and enforcement of intellectual property rights as well as on the prevention of their abuse, and shall include support regarding the establishment or reinforcement of domestic offices and agencies relevant to these matters, **including the training of personnel**." (emphasis added).*

148. Mario F. Bognanno, Michael P. Keane & Donghoon Yang, The Influence of Wages and Industrial Relations Environments on the Production Location Decisions of U.S. Multinational Corporations, 58 INDUS. & LAB. REL. REV. 171 (2005). On the other hand, it can also be argued that globalization will stimulate a race to the top, whereupon non-state actors of the developed nations will seek to raise national labor standards in the developing countries in order to avoid erosion of the higher standards back home. *See, e.g.,* Jagdish Bhagwati, IN DEFENSE OF GLOBALIZATION 128 (2004).

and recommendations of the International Labor Organization (ILO), an organ of the U.N. Not all of these instruments have universal enforcement teeth or otherwise affirmatively secure the economic welfare for workers globally, independent of the national law system.

The U.N. Human Rights Documents. All of the three U.N. human rights documents secure freedom of association essential to workplace welfare. However, only the International Covenant on Economic, Social and Cultural Rights (ICESCR) specifies workers' protection, imposing upon the state a "positive" obligation to take action for the economic welfare of its citizens, and providing for workers' basic economic entitlements as "human rights." Yet, it is the ICESCR that lacks universal adoption and support. For example, the U.S. has never ratified the ICESCR and, hence, economic and cultural rights have never been part of U.S. human rights protection.

Scholars have long argued, nonetheless, that civil and political rights cannot meaningfully be exercised in the absence of some bottom-line level of economic security – a "potential" or "capabilities" approach to human welfare. One simple example of this correlation is the scenario of an abused woman unable to leave her assaulting husband due to lack of economic self-sufficiency.[149] Hence, despite these intense debates, it is not too exaggerated to say that realistically, under the current international legal system, no one has a universal "human right" to full-time employment, upward mobility, training, skill upgrading, and overall economic well-being for the purposes of retaining their place in global market competition.

ILO Documents. The ILO (established by the Treaty of Versailles as an autonomous body within the League of Nations)[150] is notoriously known for its weak enforcement, although it has been instrumental in specifying which workers' rights constitute basic human rights (i.e., freedom of association, elimination of forced labor and child labor, and freedom from discrimination).[151] As a result, the ILO "international labor code" remains as aspirational "soft law" only. Interestingly, a superpower like the U.S. has been party to very

149. *See, e.g.,* Amartya Sen, Capability and Well-Being, in THE QUALITY OF LIFE 30 (Martha C. Nussbaum & Amartya Sen, eds., 1993); Martha C. Nussbaum, Capabilities and Human Rights, 66 FORDHAM L.REV. 273 (1997).

150. DECLARATION CONCERNING THE AIMS AND PURPOSES OF THE INTERNATIONAL LABOUR ORGNIZATION (DECLARATION OF PHILADELPHIA), ILO Constitution, as amended, Oct. 9, 1946, Annex, 62 Stat. 3485, 15 U.N.T.S. 35.

151. ILO Declaration on Fundamental Principles and Rights at Work (June 18, 1998), 37 I.L.M. 1233 (1998); Lee Swepston, Closing the Gap Between International Law and U.S. Labor Law, in WORKERS' RIGHTS AS HUMAN RIGHTS 53, 59 (James A. Gross, ed., 2003).

few ILO conventions, compared to France, for example, who has been party to many.

As of October 2006, the ILO (with 179 member states) had produced 187 conventions (which, after ratification, have the force of treaties binding upon member states), and 198 recommendations (which are advisory in nature).[152] Most ILO conventions are not self-executing, and the standards are enforced principally via two mechanisms: examination of reports, and consideration of complaints. The ILO also makes known non-compliance of conventions by member states via the issuance of "observations," whose effect seems to center upon negative publicity. Although Professor Bhagwati powerfully exclaimed, "*God gave us not just teeth but also a tongue*…,"[153] overall, the ILO cannot realistically assure state compliance, and many states end up ignoring their obligations, not to mention the fact that core labor standards under ILO framework are quite minimal and do not specifically address or apply to the New Economy (with the arguable exception of, perhaps, the ILO Convention on Termination of Employment, which offers the opposite philosophy from the U.S. "employment at will" standard).[154]

Labor protection, and especially that which pertains to the any new division of labor, will thus remain the domain of national laws. In the past, a number of countries have tried protectionist measures such as a requirement to train local personnel as a condition for investment or admission of expatriates. However, the country's need for FDI may lower its leverage, causing relaxation, waiver, or ultimately abolition of such laws in favor of liberal investment policies and promotion of free trade. For example, Mexico used to restrict percentage of ownership in FDI projects. More specifically, the country once had a Technology Transfer law that gave the government veto power over international licensing and franchising agreements.[155] Now

152. Blanpain, *et al*, *supra* note 13.

153. Jagdish Bhagwati & Jose E. Alvarez, Afterword: The Question of Linkage, 96 AM.J.INT.L. 126, 131 (2002).

154. Convention Concerning Termination of Employment at the Initiative of the Employer, June 22, 1982, International Labour Organization Convention No. 158, http://www.ilo.org/ilolex/cgi-lex/convde.pl?C158 (Only 34 countries have ratified this Convention. The United States is not among them. http://www.ilo.org/ilolex/cgi-lex/ratifce.pl?C158.)

155. *See* Mexico's 1982 "Law on the Control and Registration of the Transfer of Technology and the Use and Exploitation of Patents and Trademarks" Mexico also enacted the Law for the Promotion and Protection of Industrial Property in 1991, which was construed as the country's effort to remove barriers to foreign investment and technology transfer by broadening protection of patents and according protection to trade secrets. (In the same year, Mexico abandoned its technology transfer control mechanism.) However, under this Industrial Property Law, patentable invention may still be subject to compulsory licensing due to the public interest, although in general, the Law reflected an expressed policy of deregulation. J. McKnight and C. Muggenburg, Mexico's Industrial Property and Copyright Laws: Another Step Toward Linage with a

contractual parties are free to bargain within NAFTA framework.

WTO and Labor Standards under Regionalism. Efforts to push for a social clause linking free trade to the maintenance of global labor standards under the GATT-WTO framework have likewise failed, with the WTO deferring to the ILO's jurisdiction. As a result, the ILO's role has somewhat been revitalized and boosted, leading to ongoing ILO's technical consultations with other multilaterals' working groups.[156] The debate – for or against such trade-labor linkage -- goes on, nonetheless,[157] with the WTO advocating its own collaboration with the ILO.[158]

In the absence of a WTO labor standard, the Third World is left to devise its own labor protection or to anticipate the effect of a digital work environment. However, under the Agreement on Trade-Related Investment Measures (TRIMS), Third World WTO members are prohibited from taking measures under domestic laws that are inconsistent with their "national treatment" obligations under GATT. They are also obligated to eliminate all "quantitative restrictions" that may give rise to favored treatment of local products over imports.[159] A transitional period up to a number of years is granted to help ease them into compliance with TRIMS. Accordingly, at least in theory, Third World member countries cannot impose any technology transfer or labor requirements that can be interpreted as violative of these TRIMS prohibitions.

It is worthwhile to note, nonetheless, that notwithstanding the lack of trade-labor linkage at the WTO level, under U.S. trade laws, the President can determine the existence of "internationally recognized workers' rights" before granting tariff or trade benefits to other countries. For example, the U.S. has unilaterally linked improvement of labor conditions in various countries to the granting of its Generalized System of Preferences (GSP) to these countries, which enabled their exports to have duty-free access to the U.S. market.[160] At a minimum, this GSP system has allowed U.S. advocates to scrutinize allegedly labor abuses in foreign countries, thereby exposing international

Global Economy, M. Gordon (ed.), Doing Business in Mexico (1993) (comparing, *inter alia*, Mexico's new industrial property law to former technology transfer law).

156. *See, e.g.*, WORKING PARTY ON THE SOCIAL DIMENSION OF GLOBALIZATION, A STRONGER SOCIAL DIMENSION OF GLOBALIZATION: FOLLOW UP TO THE NOVEMBER MEETING OF THE WORKING PARTY (ILO Report 2005).

157. **WTO, Trade and Labor Standards: Subject of Intense Debate,** *found at* http://www.wto.org/english/thewto_e/min99_3/english/about_e/18lab_e.htm.

158. *Id.*

159. **AGREEMENT ON TRADE-RELATED INVESTMENT MEASURES (TRIMS), Art 2, and Annex,** Sections 1 & 2.

160. **19 USCA 2462(b)(2)(G).**

labor practices and multinationals' behaviors to the public. Whether this GSP system will be used to address international labor issues of the Information Age remains to be seen.

The EU has also promoted observations of labor rights via trade accords and related agreements, although currently there is no EU supranational employment law or industrial relations. In Europe, labor market regulation remains a national affair, although the EU maintains the supranational jurisdiction to adjudicate and legislate over some workplace matters, and it has done so, largely in the form of non-self-executing Directives.[161] On the other hand, the guaranteed free movement of labor, capital, and services in the common market remains a key component of EU citizenship, despite transitional periods granted to certain member states.[162]

For example, to implement EU-wide free movement of workers across members' borders, EU Council of Ministers regulations provide for certain safeguards of workers' rights, but solely based on "national treatment" standard – cross-border workers have the same access to vocational schools, training centers, housing, and unionization as citizens of the host member state.[163] Other Council Directives deal with unemployment and safeguard the rights of workers when businesses are transferred (i.e., discharged workers are entitled to some protection), but again EU Directives are not self-executing.[164] Accordingly, scholars have expressed concerns over the EU's ability to manage worker dislocation challenges caused by globalization, due to members' conflicting national self-interests – most supranational involvement in labor matters in the common market has been in the form of Directives, which require national implementation, rather than legally binding Regulations.[165]

As to NAFTA, the agreement itself does not cover labor. The Clinton Administration negotiated a side agreement on labor to help secure NAFTA's passage through the U.S. Congress. The side agreement, called "North

161. *See, e.g.,* Council Directive 2002/14, 2002 O.J. (L 80) 29 (EC) (Employee Information and Consultation Directive); Council Directive 2001/23, 2002 O.J. (L 82) 16 (EC) (Transfer of Undertakings Directive); Council Directive 98/59, 1998 O.J. (L 225) 16 (EC) (Collective Redundancies Directive); Council Directive 94/45, 1994 O.J. (L254) 64 (EC) (Works Councils Directive).

162. Roger Blanplain, The European Union and Employment Law, In COMPARATIVE LABOUR LAW AND INDUSTRIAL RELATIONS IN INDUSTRIALIZED MARKET ECONOMIES 165 (8TH ed. Roger Blanpain, ed. 2004).

163. *See, e.g.,* Council Regulation 1612/68, art. 1, 1968-II O.J. Spec. Ed. 475 (right of free movement belongs to "any national of a Member state . . . irrespective of his place of residence . . . to take up an activity as an employed person . . . ."); Council Directive 68/360, 1968-II O.J. Spec. Ed. 485

164. *See., e.g.,* Council Directive 2001/23, 2002 O.J. (L82) 16 (EC) (Transfer of Undertakings Directive).

165. *Id.* at 188.

American Agreement on Labor Cooperation" (NALC) -- does not provide transnational regulation and only establishes a law-enforcement mechanism. By comparison to EU, NAFTA labor protection is minimal and starkly streamlined. Notably, NAFTA contains no freedom of movement rights for regional workers. NALC simply commits each country to the creation of labor bodies, the National Administrative Offices (NAOs), which monitor compliance with domestic law and receive complaints via established dispute resolution mechanisms (persistent violation of minimum wage, child labor, and occupational health and safety laws can lead to monetary penalties in arbitration awards).[166] Much of the NALC's state cooperation obligations center around education – commitment to conferences and seminars covering from child labor and gender to occupational safety. As expected, it is difficult to measure the impact of these educational programs concretely.

The labor global project that can adequately address the new division of labor envisioned here, therefore, has not really started.

(e) Challenges in the harmonization of national laws -- free trade versus protectionism based on national security and foreign policy concerns

Although the essence of the GATT-WTO free trade philosophy is the eradication of national protectionism, in many aspects, protectionism still remains inviolate because of age-old sovereignty principles. The following discussion uses the U.S. as an example of this unilateral protectionism.

One important feature of U.S. export laws is the protection of U.S. national defense, national security and foreign policies, which in principle can be unilaterally enforced independent of global considerations, in the absence of diplomatic cooperation and other security-induced joint efforts between the U.S. and other nations.

More specifically, the U.S. Export Administration Act (EEA) and implementing Export Administration Regulations (EAR) impose strict liability and stringent licensing requirements upon U.S. technology exporters. These licensing requirements center around the types of products shipped, the identity of end-users, and ultimate destinations of shipments. By virtue of EAA/EAR legal definitions of "re-exports" and "deemed exports," the licensing requirements extend to (i) release of U.S. technological data to foreigners anywhere in the world, and (ii) exports of U.S. technology from

166. **North American Agreement on Labor Cooperation,** U.S.-Can.-Mex., sec. C, Sept. 8-14, 1993, 32 I.L.M. 1499, 1507 (1993).

third countries that are beyond the territorial jurisdiction of the U.S.[167] These licensing requirements aim to implement not only national defense or security concerns but also American foreign policies, in addition to other U.S.-imposed trade embargoes and foreign boycotts of other nations (including those criticized as a pure product of historical development, with no relationship to economic reality, such as the American boycott of Cuba).[168]

The EAA-EAR regime also imposes foreign anti-boycott measures, clearly aimed to implement U.S. foreign policies. Specifically, the EAA-EAR regime prohibits U.S. persons from taking part in foreign boycotts against friends of the U.S., a law intended to counter against the Arab boycott of Israel.[169]

Finally, despite the U.S.'s liberal policy toward inbound FDI under "free enterprise" rubric, the U.S. also controls the inflow of FDI based on national security concerns, as do many other nations. The U.S.' "Exon-Florio" law gives the President the authority, free from judicial review, to gather and review "credible evidence" in order to block mergers and acquisitions by foreigners of U.S. companies.[170] This Presidential power is delegated to the Committee for Foreign Investment In the U.S. (CFIUS), an ad-hoc body without "independent agency" status, who determines what constitutes "national security" in exercising this inbound FDI screening authority. Exon-Florio law was the legal apparatus used recently to block China's acquisition of Unocal.[171]

167. EAA, 50 App. U.S.C. Sec. 2415 (definitions), Subsection (5) (export); EAR, Sections 730.5 (re-exports and scope of exports), 734.2 (b) (export and re-export).

168. CUBAN LIBERTY AND DEMOCRATIC SOLIDARITY (LIBERTAD) ACT OF 1996 (HELMS-BURTON ACT), 22 U.S.C. Sections 6021-6091; CUBAN DEMOCRACY ACT OF 1992, [USC CITE]; CUBAN ASSETS CONTROL REGULATIONS, 31 CFR Part 515. *Compare, e.g.,* Jason S. Bell, Violation of International Law and Doomed U.S. Policy: An Analysis of the Cuban Democracy Act, 25 U. MIAMI INTER-AM.L.REV. 77, 127 (1993). The U.S. boycott of Cuba has prompted "blocking" laws from other developed jurisdictions, namely Canada and the United Kingdom. *See* Order Requiring Persons in Canada to Give Notice of Communications Relating to, and Prohibiting Such Persons From Complying With, An Extraterritorial Measure of The United States That Adversely Affects trade or Commerce Between Canada and Cuba (Foreign Extraterritorial Measure (United States) Order, 1992, JUS-92-777-01 (SOR/DORS); United Kingdom Protection of Trading Interests Order 1992 (Oct. 14, 1992).

169. EXPORT ADMINISTRATION ACT, 50. U.S.C. App. § 2407 (Foreign Boycotts); EXPORT CONTROL REGULATIONS, 15 CFR Part 760.2 (2007) (Foreign Boycotts).

170. DEFENSE PRODUCTION ACT OF 1950, as amended by OMNIBUS TRADE & COMPETITIVENESS ACT OF 1988, xx USC 721, TITLE V, PART II, Section 5021 (Review of Certain Mergers, Acquisitions, and Takeovers) [Exon-Florio Provision].

171. *See* www.orator.com, Senate Bill 1412, 109th Congress, 15 July 2005; *House of Representatives Bill 344*, 109th Congress, 1st Session, 29 June 2005; News from Congressman Thomas Reynolds, New York's 26th District, "Reynolds Chellenges China's Bid for UNOCAL – Congressman Says Proposed Bid Brings Up National Security, Energy Concerns (for immediate release June 30 2005); .Statement of Hon. C. Richard D'Amato, Chairman, U.S.-China Economic and Security Review Commission – National Security Dimensions of the Possible Acquisition of UNOCAL by CNOOC and the Role of CFIUS, Before the House Committee on Armed Services (July 13, 2005); Kerry Dumbaugh, CRS Report for Congress, July 8, 2005, at 4-8 at www.fas.org/sgp/crs/rev/1B98014.pdf. (Dumbaugh is specialist in Asian affairs, Foreign Affairs, Defense and Trade Division); U.S-China Economic and Security Review Commission, Hearing on "China's Capital Markets

In reality, Exon-Florio has been criticized as a front for anti-hostile takeover tactics by U.S. corporations resisting international acquisitions, thereby causing scholars to challenge whether the "national security" rubric of Exon-Florio is meant to cover (i) economic impact upon U.S. firms, which may be determined by individual corporate actors; or (ii) U.S. foreign policies, which may change from administration to administration.[172]

Although Exon-Florio is the main gatekeeper of inbound FDI, other federal laws also restrict FDI and foreign control of certain types of U.S. industry and businesses.[173] Similarly, other nations seeking FDI have also used their foreign investment laws either to attract FDI or to serve the same gatekeeper functions as the U.S.'s Exon Florio law. The "national defense" or "national security" rubric remains perhaps the most powerful manifestation of sovereignty and a tool of unilateral protectionism (although what constitutes "national security" of course can be scholastically challenged, either legally or factually).

Because the "national defense" rubric as symbol of sovereignty is soundly grounded in customary international law, it is no surprise that both the multilateral regime of GATT and the regional regime of NAFTA specifically recognize and carve out "national security" exceptions from principles of free trade.[174] TRIPS itself contains an exemption from its "patent" protection based on a member state's need to protect "*ordre public*."[175] Similarly, under NAFTA, a nation can deny patents when their commercial exploitation might endanger

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Strategies," opening statement of Michael R. Wessel, Commissioner and Hearing Chair (August 11, 2005). *See generally* Susan W. Liebeler and William H. Lash III, Exon-Florio: Harbinger of Economic Nationalism?, Reg.: The Cato Rev. of Bus. & Gov't, *available at* http://www.cato.org/pubs/regulation/reg16n1d.html. *See also* Official website of *The Economist*, www.Economist.com, China's Economy, 2 Aug 2005; Official website of *UNOCAL*, www.unocal.com, Official News Archive, 22 June 2005; .Official website of *CNOOC Ltd.*, www.cnoocltd.com, CNOOC Limited Proposed Merger with UNOCAL Offering US$67 per UNOCAL Share in Cash, 23 June 2005, at 3; Official website of *CNOOC Ltd.*, www.cnoocltd.con; CNOOC Limited Files CFIUS Notice, 2 August 2005; Official website of *UNOCAL*, www.unocal.com, UNOCAL sets date of Special Meeting for Vote on Chevron Merger, 29 June 2005; Official website of *Reuters*, www.reuters.com, U.S. Senator Vows to Try to Stop China-UNOCAL Deal, 15 July 2005.

172. *See, e.g.*, Knee, Limiting Abuse of Exon-Florio By Takeover Targets, 23 GEO. WASH. J. INT. L. & ECON. 475 (1989); Alvarez, Political Protectionism and United States International Investment Obligations in Conflict: The Hazards of Exon-Florio, 30 VA. J. INT. L. 1 (1989).

173. For example, the Federal Communication Act prohibits issuance of a federal communication license to non-citizens. 47 U.S.C. § 310(b). Unless authorized by the Comptroller of Currency, foreigners cannot serve as bank directors, and cannot acquire control of domestic banks or open new banks without governmental approval. 12 U.S.C. § 72. Foreigners cannot obtain international insurance or financial guarantees from the U.S. Overseas Private Investment Corporation. Overseas Private Investment Corporation, OPIC Handbook 22 (2006), www.opic.gov/pdf/OPIC_Handbook.pdf. Nor can they own more than 25% of an air carrier or vessel engaged in coastal shipping. 49 U.S.C. §§ 40102(a)(15)(c), 41102. Other restrictions and control of imports also exist under U.S. laws and administrative procedures governing various types of international trade.

174. NAFTA, Art. 2102; GATT 1947, Art. XXI (national security exceptions).

175. TRIPS, Art. 27.2.

public order or morality.[176] The vast unilateral power of the nation-state under "national security" or similar rubric is even intensified in this day and age, when sovereignties' concerns justifiably focus on international terrorism, most notably the U.S. after the atrocities of September 11.

A look at the U.S.'s international trade law controlling imports will demonstrate the tremendous leverage held by a superpower and how a domestic law system will protect its own producers and the national interest. Under Special Section 301 of the U.S. Trade Act of 1974, the U.S. scan impose trade sanctions upon another country if that country is deemed to have "*unfairly restricted the U.S. foreign trade*."[177] Even when the foreign state is in full compliance with an international agreement such as TRIPS, under Special Section 301, the U.S. reserves its right to impose penalties upon the foreign country if, in the U.S.'s view, the foreign country does not provide "*adequate and effective*" intellectual property protection.[178] The U.S. Trade Representative can create a "watch list" naming countries who are particularly lax in their protection of IPR or who have imposed barriers to market access.[179] Potentially, this can mean that if a developing nation imposes measures to protect its own workforce by mandating certain level of technology transfer as a condition for FDI, theoretically the U.S. government can retaliate with trade sanctions against foreign products entering U.S. territory in protection of U.S. corporate citizens.

Special Section 301 as an example of the omnipotent exercise of national sovereignty by a superpower has raised questions whether the U.S. itself has violated the equal protection spirit of the only multilateral IPR-free trade regime available, TRIPS.[180] Unlike the U.S., who has enough economic and political muscle to engage in this type of unilateralism, Third World countries cannot afford to do the same, for fear that they may lose FDI as well as invoking the U.S.' trade retaliation.

(f) Other cutting-edge areas of law that must be developed, reviewed, and/or harmonized globally. Uniform global regulation must also target the

176. R. Folsom and W.D. Folsom, Understanding NAFTA and Its International Business Implications, Chapter 8 (1985).

177. Trade Act of 1974, 19 USCS § 2411 (a)(1)(B)(ii) (1996). *See also* Omnibus Trade and Competitive Act of 1988 (the 1988 Trade Act) and Bello and Holmer, "Special 301": Its Requirements, Implementation and Significance, 13 FORDHAM INT.L.J. 259 (1989-90) (discussing "Special 301" jurisprudence).

178. Trade Act of 1974, *id.* § 2411 (d)(3)(B)(i)(II) (1996).

179. Bello and Holmer, *supra.*

180. Lina M. Monten, The Inconsistency Between Section 301 and TRIPS. 9 Marq. Intell. Prop. L. Rev 387, 397-415 (2005).

present jungle of Internet usage, *E*-commerce, and trans-border data flows.[181] Because of the newness and evolving nature of these areas of the law and the limit of this Article, discussion on these issues deserves separate treatment and hence will be saved for another day.

The following *three* premises, however, must be noted. *First*, the Internet has also necessitated legal protection of digital work as a form of intellectual property. The Internet offers an ever-changing medium, thereby creating new legal challenges, including: (i) jurisdiction to police the Internet, (ii) the scope of legal protection, and (iii) the use of "anti-circumvention measures" dealing with "digital rights management tools" such as encryption, virtual containers, and watermarks (these are tools created by technology to protect digital works against online infringements). For example, the U.S. Digital Millennium Copyright Act of 1998, which implemented the 1996 WIPO Copyright Treaty, established a legal framework for Internet copyright issues, after a controversial battle between Hollywood and Silicon Valley in the U.S. Congress about anti-circumvention provisions.[182] Specifically, Hollywood sought to protect IPR holders, while Silicon Valley sought the ability to engage in reverse engineering, computer security testing and encryption research. These anti-circumvention measures were described as the "third legal regime," because they offer "legal protection of technological protection of copyright protection."[183]

Second, from a policy-making perspective, global data flow and information exchange will help improve international distribution of knowledge, a positive result of economic globalization that must be encouraged as freedom of speech. However, tension exists between protected freedom of speech and (i) national security concerns (from the state's perspective); or (ii) privacy concerns (from the individual's perspective).[184] This tension should be of concern to policy-

181. For example, in 1980, the OECD approved 14 Guidelines on the Protection of Privacy and TransBorder Flow of Personal Data., OECD Guideline on the Protection of Privacy and Transborder Flow of Personal Data, (Sept. 23, 1980), http://www.oecd.org/LongAbstract/0,3425,en_2649_201185_1815186_1_1_1_1,00.html. In 1995, Europe finalized a data privacy directive, Council Directive 95/46 1995 O.J. (L 281) 31 (EC), in response to which an EU-US "safe harbor" agreement has been executed for the benefit of those U.S. firms who are willing to abide by EU standards. Commission Decision 2000/520 pursuant to Directive 95/46, 2000 O.J. (L 215) 7. This agreement in effect gives the EU directive the *de facto* status of a global guideline. *See also* Council Directive 2000/31, 2000 O.J. (L178) 1 (regulating electronic commerce in the common market and recognizing e-contracts).

182. Digital Millennium Copyright Act, Pub. L. No. 105-304, 112 Stat. 2860 (1998) (codified in scattered sections of 17 U.S.C. and 28 U.S.C.). *See also* Cohen, Anti-Circumvention: Has Technology's Child Turned Against Its Mother? 36 Vanderbilt J. Transnational L. 961 (2003).

183. Cohen, *id.*

184. For example, this tension is seen in the conflict between on-line availability of encryption technology versus the U.S. Department of Commerce's specialized regulation requiring licensing and government

and lawmakers of democratic societies that guarantee freedom of speech. Single-party dictatorial regimes, on the other hand, will be motivated to curtail the flow of internet information and access to international communication or news media via various forms of government control.

Third, from a pure legal perspective, the legal issues raised by electronic or digital communication are not really new issues, but, rather, existing legal issues arising under a new context, or a new method of engaging in communication. For example, a contract signed by email is still a contract, with all legal elements and implications of the governing contract law, except for the legal twist created by the new method of contract execution: whether signatures of the contracting parties can properly be authenticated to avoid mistaken of identity, fraud, or lack of meeting of the mind. When global regulation of e-commerce comes into play, the law of contract does not have to be rewritten. Rather, the legal challenge is to fit the new method of contract execution into the existing law of contract. Take another example from tort law: when internet defamation is committed, the law of defamation and the law of privacy do not have to be rewritten. Rather, it is the question of how to deal legally with the tort of defamation under existing law when the tort is committed via the hitting of a computer keyboard.

Again, none of the Internet legal protections mentioned above specifically addresses Those At Risk, the new division of labor, or the lack of equal access to information brought about by AI. Not yet!

Finally, the idiosyncrasies of nationalism, the native languages used and nuances of legal text translations, and differences in cultures all add to the impossibility of total global equalization of legal standards and principles. While shared principles do exist (a legal phenomenon called "convergence"), overall law-making has been a creature of national sovereignty. The least-

scrutiny of encryption technology exports. *See* the Early Roots of PGP [Pretty Good Privacy], Philip Zimmermann, available at http://www.philzimmermann.com/EN/background/index-peace.html. (first modern online encryption software by Phil Zimmermann, posted on USENET, resulting in a three-year criminal investigation by the U.S. Attorney's Office for the Northern District of California). *Compare* 69 Fed. Reg. 71356 (Dec. 9, 2004) (current encryption regulations by Department of Commerce).

Cases have been filed by scientists challenging Commerce regulations applicable to encryption technology based on First Amendment grounds. Bernstein v. U.S. Dept. of State, 922 F. Supp. 1426 (N.D. Cal. 1996); Bernstein v. U.S. Dept. of Justice, 176 F.3d 1132, 1136 (9th Cir. 1999), vacated, 192 F.3d. 1308 (9th Cir. 1999) (en banc hearing never took place); Bernstein v. U.S. Dept. of State, 945 F. Supp. 1279 (N.D. Cal. 1996); Junger v. Daley, 8 F. Supp.2d 708, 714 (N.D. Ohio 1998), reversed, 209 F.2d 481, 484 (6th Cir. 2000); Karn v. U.S. Dept. of State, 924 F. Supp. 1 (1996); Karn v. U.S. Dept. of State, 107 F.3d 923 (D.C. Cir. 1997). Encryption technology can be used to secure or decode the confidentiality of electronically or digitally transmitted data. *See* 15 C.F.R. § 742.15 (2007) ("[e]ncryption items can be used to maintain the secrecy of information, and thereby may be used by persons abroad to harm U.S. national security, foreign policy, and law enforcement interests.")

developed economies are still left out of the "national regulation" race-to-the-top. They either have no law, or law with little enforcement, or are still struggling to develop or test their embryonic law against a myriad of models from the developed jurisdictions, which are based on totally different economic concerns or national interests. Writers have criticized this as "legal imperialism," another dimension of the North-South debate."[185]

- **Second Method of Forming International Economic Law: Private Deals and Voluntary Codes of Conduct**

a) Formation of lex mercatoria via privately negotiated agreements. International economic law can also be formed as norms of practice via negotiated agreements in private deals among private actors, or between private actors and governments (the "Private Code"). In this Private Code, the pattern of technology transfer can occur at two levels: "country" level (whereupon the host country is a contractual party) and "firm" level (where a foreign investor may transfer technology to local partners, personnel, subsidiaries, and/or affiliates).[186]

Thus, the formation of practice norms that help produce *lex mercatoria* in the technology market is the work of governments, inventors, businesses, and lawyers. Lawyers, who provide the legal human capital, play an essential part in this second method of forming international economic law, especially in complex contractual relationships that involve negotiated risk-management mechanisms.[187] Products of the rule of law in the form of practice norms, therefore, depend on the training, accumulation and distribution of this legal human capital,[188] which further depends on (i) the system of national law governing lawyers' conduct, and (ii) transactional costs – i.e., complex regulatory systems increase the costs of legal human capital to society. Accordingly, while lawyers help shape the Private Code, the quality and availability of that participation also depends on who has more money to pay for the services of lawyers, and who has the more developed system of legal training. The integral role of legal human capital in the formation of the Private Code, therefore, can intensify the discordance between North and

185. *See, e.g.,* James A. Gardner, Legal Imperialism: American Lawyers and Foreign Aid in Latin America (1980). *See also* F. Hoffman-LaRoche, Ltd. v. Empagran S.A., 542 U.S. 155, 169 (2004)
186. Carlos Correa, *Prospects and New Dimensions of International Transfer of Technology: An Issue Paper*, in The Law and Business of Licensing, ed. Jay Simon & Larry Evans (vol. three 1999 revision) (West).
187. Gillian K. Hadfield, *Don't Forget the Lawyers: The Role of Lawyers in Promoting the Rule of Law in Emerging Market Democracies*, 56 DePaul L. Rev. 401 (symposium Winter 2007) (analyzing capacity of lawyers to influence and enforce contractual bargains).
188. *Id.*

South, directly affecting bargaining power and leverage.

b) Some observations on the patterns of technology transfer based on private agreements. Both FDI contracts[189] and technology licensing agreements (and to a less direct extent, franchise agreements[190]) serve as means for the import-export of patent rights across borders. Due to the limit of this Article, this discussion omits franchises and focuses on licensing agreements as the more popular, direct, and specific method of technology transfer. It is noted, however, that a combination of international technology licensing and "business format" franchising can effectively "lift" an AI-operated production and relocate it abroad.

Overall, technology can be transferred in the importation and licensing of patents, know-hows, [191] and turnkey projects via arms-length transactions and not just ownership arrangements.[192] Not all relevant or critical knowledge or know-how can be transferable via licensing, making the training and data- sharing component of an investment crucial to the skill and knowledge development of local partners and personnel. A data-sharing arrangement is typically accompanied by a confidentiality undertaking, which practically is difficult to enforce although it brings a sense of comfort to the business executive in charge. Licensing is a less expensive or intrusive means to take a technology-based business abroad than FDI or equity ventures, or licensing can also occur in conjunction with, or as a part of, FDI, equity ventures, or a strategic alliance or data exchange arrangement. Relying on licensing alone to obtain technologies may limit access to state-of-the art inventions, "critical assets," or core knowledge, although lack of capital investment or leverage may leave the developing nations with no other alternatives.

It should be noted that in the 1990s, "strategic alliances" was the legal and business cooperative form that enabled technology or research and

189. Carlos Correa, *supra* at 2645. In the 1990s, for example, FDI was the dominant transfer channel to "second tier" Asian countries such as Malaysia, Thailand, and the Philippines. *See, e.g.,* Lall, S, The Interrelationship Between Investment Flows and Technology Transfer: An Overview of the Main Issues (UNCTAD, ITD/TEC/1, Geneva (1992)).

190. Franchise is a method of doing business that permits rapid and flexible penetration of a market, in which the franchisor typically does not manufacture the products sold. Franchise has been popular with fast-food establishments, and may implicate antitrust issues. *See, e.g.,* P. Zeidman, Memorandum to Foreign Counsel: An Introduction to International Franchising (1970); G. Glickman, Typical Franchise Agreements (Fast Food Franchise), Vol. 15A, Section 11.08 (1983).

191. Aspects of technology not encompassed in a patent may be contained in the legal definition of "Know-How" in a technology licensing agreement. Ethan Horwitz, Patent and High Technology Licensing, PLI June 2005. "Know-how" refers to specific commercially valuable knowledge that may or may not constitute trade secrets, and may or may not be patentable. *Id.* The protection of know-how's is mostly a function of tort, contract and trade secret laws.

192. *Id.*

development (R&D) partnerships, yet this form of cooperation was largely limited to partners from the industrialized nations.[193] This model limited the plurality of sources in the technology market and could easily lead to "technology cartels" among the multinationals of the developed world, although it could also serve as a good example of fair play, arms-length bargaining in negotiation, and/or skilled contract drafting by technology producers. Strategic alliances in technology can also greatly stimulate and perfect inventions. Yet, the benefit of R&D strategic alliances in the private sector has rarely been made available to the developing nations.

To avoid competitive threats, where possible, large firms going abroad have typically avoided transnational transfers and licensing agreements to the developing nations and, instead, have relied exclusively on wholly owned subsidiaries to receive knowledge from their parents, or otherwise on inter-affiliate transactions.[194] Similarly, large software producers prefer distribution agreements that do not entail the transfer of source programs or trade secrets.[195] These "internalized" forms of technology transfer (i.e., those taking place intra-firm) typify private technology protectionism against the internationalization of technology. Furthermore, transfer of technology to the developing nations usually occurs in the "maturity" stage of the products, whereupon the licensor receives royalty as a source of income and provide some form of support,[196] but actual training or passing of knowledge to the licensee is rather limited. These restrictive methods actually impede the formation of *lex mercatoria* that can contribute to the international distribution of knowledge.

The licensee, on the other hand, must be sophisticated enough to safeguard itself against the following, among others:

--Whether royalty charged is excessive, thereby draining the licensee's resources and hard currency reserve;

--Whether the technology licensed may be obsolete, or of second-class status, which is quite difficult to evaluate or decipher if the licensee is less technologically competent);

--Whether rights to the technology licensed may be subject to challenges, and whether the licensor is financially prepared or willing to warrant against

193. Carlos Correa, *supra, citing* Mylteka, L, Technology Transfer Trends: An Overview of Strategic Partnering (paper prepared for the Technology Development and Promotion Division, UNIDO (1992).
194. Susan K. Sell, POWER AND IDEAS: NORTH-SOUTH POLITICS OF INTELLECTUAL PROPERTY AND ANTITRUST 56 (Suny Press 1998).
195. Carlos Correa, *supra* at 2641.
196. *Id.*

any such risk;

--Whether the transfer contract contains restrictive features that may unduly and oppressively burden the licensee and hence hamper its road to technological independence; and

--Whether the transfer of the technology meaningfully encompasses adequate transfer of know-hows to enable the licensee to maximize its economic benefit of the licensing arrangement.

c) Relationship between national regulation and the formation of lex mercatoria in private deals. The matters enumerated above can become subjects of regulation by the licensee's nation, which can take the form of an FDI law, a technology transfer law, a government-approved FDI or licensing model contract, or even parliament approval of an FDI or licensing project. Influential multinationals as contracting parties have been known to seek specific sovereign guarantees, and/or parliament or presidential approval of their contracts as a form of "ad hoc" legislation. While liberal FDI national laws will reduce the costs of internationalization for businesses and hence encourage FDI as an instrument for technology transfer, wise policy choices calls for an FDI regime that must take into consideration the interest of Those At Risk.

More specifically, from the licensee's perspective, meaningful technology transfer must encompass a complete transfer of all three elements: material, design, and capacity, although these three elements can overlap or are difficult to segregate. In a "material transfer," the artifact itself is transferred. "Design transfer" encompasses items such as blueprints, formulas, books and other information relating to the process of design. For nations seeking technological independence, "capacity transfer" is most desirable, involving the transfer of scientific knowledge and technical expertise. Only with capacity transfer can a recipient nation inherit the active knowledge to produce locally adapted technology from foreign prototypes to become self-sustained.

According to at least one historical researcher, the past experiences of America, Japan, and Russia demonstrate the importance of design and capacity transfer. [197] The U.S. acquired technological capacity first by buying British technology and then adapting it to local needs, with innovation boosted by the skills of émigrés from Europe. In contrast, in the case of Japan and Russia, the state played an active role in developing the country's technology capacity.

197. SUSAN K. SELL, POWER AND IDEAS: NORTH-SOUTH POLITICS OF INTELLECTUAL PROPERTY AND ANTITRUST at 46-50 (Suny Press 1998).

The Japanese emphasized "people exchange" by sending students abroad and by importing foreign technicians, enabling Japan to adapt and then invent its own technology. The Japanese experience reflected conscious governmental policies to prevent undue dependence on foreign technology. Taiwan and South Korea followed this example and put forth support to local firms to produce technology exports.[198] According to experts, for a period of time, South Korea and Japan both deliberately restricted FDI during their early stage of industrialization in order to enhance and encourage the development of local technological capabilities.[199] Experts noted that the growth of East Asia has been due to Japan's and South Korea's ability to master existing foreign technology and translating it into efficient production and more innovation. Their conscious governmental policies helped bring about these results.

With Russia, right after the Bolshevik revolution, while the Russians politically condemned the imperial West, economically they welcomed Western technology and actively sought acquisitions.[200] In contrast, other late-coming developing nations have practiced import-substitute industrialization, with foreign corporations remaining virtually the source of capital, technology, and managerial expertise.[201] As of the 1970s, UNCTAD revealed that nearly 80 percent of licensing agreements in the Andean Pact "forbade local companies the use of technology of the foreign parent to produce higher value-added exports."[202] The prevailing method of technology transfer in Latin America was material transfer (i.e., imports of finished goods or product-embodied technology) and FDI in wholly owned subsidiaries or foreign acquisition of local firms. True design or capacity transfer was nearly absent. The only relative exception was the extractive industry, where the host country was able to wrestle for some bargaining power due to its control over land and natural resources.[203]

The developing nation's policy, therefore, should focus on the creation of conditions to improve the bargaining power of local technology recipients toward technological independence. More specifically, in technology

198. *Id.* at 65.
199. Carlos Correa, *supra* at 2646, 2678 footnote 21. .
200. Sell, *supra.*
201. *Id. at* 54-55.
202. *Id.* at 56, citing Bergsten, Horst, and Moran, American Multinationals and American Interests (Brookings Institution 1978). *See also* UNCTAD, "Report of the Second U.N. Conference to Review All Aspects of the Multilaterally Agreed Equitable Principles and Rules for the Control of Restrictive Business Practices," TD/RBP/CONF.3/9 (Feb. 11, 1991) 1, ¶ 3.
203. Sell, *supra* at 60-63.

transactions, the policy combination should be to increase local bargaining power while reducing and stabilizing technology licensing's royalty rates.

The strengthening of bargaining power will also depend on the knowledge of the recipient party with respect to international business transactions law and norms. Here, again, there may be the impact of "legal imperialism:"[204] the American legal model has always occupied an elitist place on the world map – armies of American economic and legal experts have long globe-trotted to provide assistance to multinationals entering the emerging markets.[205] The domination of the American legal system in the global scene, in which transactional lawyers are viewed as dealmakers who zealously represent their clients' interest at full force, rather as officers of the rule-of-law or justice system, tends to increase and perpetuate the unequal distribution of bargaining power.

It follows, therefore, that private deals' contract provisions can and should be shaped by sovereign policy- and rule-making. As already mentioned, impediments to international technology transfer also exist due to national FDI and export control laws grounded in the national security and foreign policy interests of the technology producers' home nations. These national sovereignty restrictions find their way into private deals, not only via governmental licensing requirements controlling exports, but also by way of special provisions in private contracts. For example, if the relevant technology was developed in whole or in part with U.S. federal funds, the United States may be granted (i) a "march-in" right allowing the government to select another vendor to produce the products; (ii) a covenant by the licensor to manufacture only in the U.S., or (iii) a right for the government to force the licensor to grant further licenses only to selected third parties upon government-specified conditions.[206]

Foreign technology licensing may trigger other legal issues. Two examples are discussed here for illustration. *First*, contracts may be executed in multiple languages of equal validity, leading to problems in interpretation. This is even more nightmarish for drafters and negotiators when the host country is technologically primitive, so there is no word in the local language to describe a concept. This problem can be solved with a clause specifying the governing

204. *See* Note 138, *supra* (legal imperialism).

205. Gillian K. Hadfield, *Don't Forget the Lawyers: The Role of Lawyers in Promoting the Rule of Law in Emerging Market Democracies*, 56 DePaul L. Rev. 401 (symposium Winter 2007).

206. Ethan Horwitz, Patent and High Technology Licensing, PLI June 2005.

language (for example, English) to be used in international dispute resolution proceedings, but this type of "language" clause in itself may be indicia of legal imperialism – the use of English in interpretation for dispute resolution will bring with it the cultural bias associated with the "English" method of thinking –i.e., the Western thought process and cultural context. *Second*, the licensor may have to pay patent registration costs in the host country, occasioning the following common lament by bewildering technology executives: although their companies are licensing technology to the local partner as a good deed, they end up having to pay a fee for such licensing just to protect their proprietary interest.[207] The cost of such patentability will naturally be passed on to the royalty rate charged to the licensee, and ultimately borne by Third World inhabitants.

Last but not least, norms of practice can also be formed as de facto private rulemaking in individual employment or collective bargaining contracts, or equity venture agreements, whose terms may impose or incorporate labor standards, trade secret or non-compete covenants, training commitments, or workforce downsizing protection. These privately negotiated contracts may also be made to conform to specific national law requirements on FDI, technology transfer, labor, employment, or business structure.[208] In this regard, another reality check of the Third World is in order: favorable laws on the books are not necessarily a precondition for meaningful collective action on the part of workers, nor a means to promote transnational labor solidarity. Indeed, the gap between legal doctrines and actual enforcement can be a dilemma in all parts of the world, including the United States.[209]

d) Formation of lex mercatoria via corporate self-compliance. Legal pluralism advocates that law be formed by non-state sources. Accordingly, among the sources of *lex mercatoria* are the multinational corporations (MNC)'s internal rules and their voluntary codes of conduct. These voluntary codes are MNC's effort at self-compliance to improve public relations, or, in some

207. *Id.*

208. *See, e.g.,* Donald C. Dowling, Jr., The Practice of International Labor and Employment Law: Escort Your Labor/Employment Clients into the Global Millennium, 17 LAB.LAW 1, 17 (2001); Katherine V. W. Stone, The New Psychological Contract: Implications of the Changing Workplace for Labor and Employment Law, 48 UCLA L.REV. 419, 576-92 (2001).

209. *Compare* Carlos de Buen Unna, Mexican Trade Unionism in a Time of Transition, in LABOUR LAW IN AN ERA OF GLOALIZATION 401, 409 (Joanne Conoghan, Richard Michael Fischl &Karl Klare, eds. 2002) *and* LANCE COMPA, BLOOD, SWEAT AND FEAR: WORKERS' RIGHTS IN U.S. MEAT AND POULTRY PLANTS (Human Rights Watch, 2005) (examining sectoral labor conditions in the U.S.); *accord* James Atleson, The Voyage of the Neptune Jade, The Perils and Promises of Transnational Labor Solidarity, 52 BUFFALO L.REV. 85, 87 (2004).

cases, to monitor their own contractors and suppliers.[210] These codes may set norms of best practices for industry, or may even be found legal binding as an incorporated part of enforceable contracts.[211]

Scholars have classified these voluntary codes into four groups: (i) first-generation codes are developed without input from NGOs, unions, or industry – a closed-loop compliance system monitored by the MNC's own staff or independent contractors against the MNC's internal standards; (ii) second-generation codes are designed by industry groups or trade associations (such as the American Apparel Manufacturing Association); (iii) third-generation codes are designed by external parties such as NGOs in consultation with trade unions, stakeholders, and others; and (iv) fourth-generation codes are the products of government representatives such as the OECD or organs of the United Nations.[212]

Problems with all four kinds of code lie in the degree of independence, impartiality, transparency, and effectiveness of the monitoring process; the voluntary or coercive nature of the guidelines (some voluntary codes are more coercive than others); and the motivation of MNCs – whether to use the voluntary guidelines as defense strategy or public relations campaigns in response to public pressure, rather than bona fide efforts at self-compliance. The debates about the value and effect of these voluntary codes are ongoing.[213] It should be noted, however, that even if MNCs show their good faith by adopting self-imposed codes of conduct, their efforts can still severely be curtailed or rendered moot by national law systems that exercise government control over citizens' freedom of association such as China and Vietnam. In

210. *See, e.g., See, e.g.,* Wal-Mart Stores, Inc. Standards for Suppliers, 2005 Report on Ethical Sourcing 28-29 (2005) *available at* http://walmartstores.com/Files/05_ethical_source.pdf (version dated January 10, 2005 was topic of litigation in Doe v. Wal-Mart Stores, Inc., C.A. (CA D.Ct. September 13, 2005), filed on behalf of Wal-Mart workers in China and Bangladesh).

211. *Cf.* Doe v. Wal-Mart Stores, Inc., *Id. See also* Harry Arthurs, Private Ordering and Workers' Rights in the Global Economy: Corporate Code of Conduct as a Regime of Labour Market Regulation, in LABOUR LAW IN AN ERA OF GLOBALIZATION 471, 484 (Joanne Conaghan, Richard Michael Fischl & Karl Klare, eds. 2002).

212. Michael Posner & Justine Nolan, Can Codes of Conduct Play a Role in Promoting Workers' Rights? In INTERNATIONAL LABOR STANDARDS: GLOBALIZATION, TRADE AND PUBLIC POLICY 207, 208-215 (Robert J. Flanagan & William B. Gould IV, eds. 2003).

213. *See, e.g.,* Harry Arthurs, Private Ordering and Workers' Right in the Global Economy: Corporate Codes of Conduct as a Regime of Labour Market Regulation, *supra* at 487; Adele Blackett, Global Governance, Legal Pluralism and the Decentered State: A Labor Law Critique of Codes of Corporate Conduct, 8 IND. J. GLOBAL LEGAL STUD. 401, 418-20 (2001); Michael R. Triplett, SOX Compliance, Corporate Codes of Conduct Create Challenges for Advising Firms Abroad, DAILY LABOR REPORT, March 20, 2006); Cynthia Estlund, Rebuilding the Law of the Workplace in an Era of Self-Regulation, 105 COLUM.L.REV. 319, 324-5 (2005); Clare Moore Dickerson, Transnational Codes of Conduct through Dialogue: Leveling the Playing Field for Developing Country Workers, 43 FLA.L.REV. 611 (2002).

these countries, workers' unionization does not always mean freedom of association or the betterment of the membership's economic welfare. In other words, an employer's code may respect unions, but the government will shut down workers' voice. Workers' government can be the ultimate norm-setter for the local workforce. All factors considered, the transformation of these voluntary codes into norms of practice having the force and recognition of customary private international law or *lex mercatoria* is indeed a long-term, difficult process.

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In summary, the above bird's eye view of the current international legal regime and its deficiencies points to *five* conclusions:

1) Prospect of a coordinated system of global regulation that can adequately address the New Economy and Those At Risk looks rather leak;

2) Despite the popularity of the buzzword "globalization,"[214] national sovereignty and local governments remain the dominant force of law, making the success of global law-making even less likely. This was the eality of the 20th century, and will continue, especially considering the international terrorism crisis that elevates unilateral national security measures to the highest priority for any nation;

3) Economic globalization[215] and technological advancement have always been developed much faster than the protective rule of law, such that the rule of law often lags behind reality;

4) Third World firms and host countries must therefore resort to self-help within the current multilateral system, rather than waiting for future global regulation to protect them; and

5) As discussed below," long-term investment in workforce education is one such self-help to close the "cognitive divide" and achieve technology independence. Consequently, Third World countries must design their national laws with this educational perspective.

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214. International labor textbook authors Roger Blanpain, Susan Bison-Rapp, William R. Corbett. Hilary K. Josephs, and Michael J. Zimmer categorize the buzzword "globalization" into four definitional concepts: geographical globalization (global ease of communization and travels), economic globalization (cross-border economic integration), business management globalization (multinational management of economic activities), and sociological globalization (global cultural exchange, global consumption patterns, and multiculturalism). Blanpain, *et al,* and authorities cited therein, *supra*, at 3-7.

215. *Id.*

B. IN THE DOMAIN OF EDUCATION: Training and Development of the "Gray Matter" in the Native Workforce

The Role of the Host Country: Government and the Private Sector. The focus on education as a long-term investment will bring about the preventive solution. Third World countries must develop technological competence for their workforce, especially in software development, and invest human capital for local invention. The natives – both governements and private actors -- must become more sophisticated and proficient at selecting and negotiating with foreign technology partners, and must focus on local training components in the FDI or technology licensing process. These objectives necessitate government subsidy programs and grass-root partnerships between the public and private sectors.

At the beginning of this millennium, OECD data confirmed that (i) in the new economy, human capital is a key enabler in innovation; (ii) skilled technology workers and researchers have become more mobile globally, as seen in immigration trends and corporate behaviors; and (iii) skill needs are currently met by national educational systems as well as by businesses.[216] Notably, in the developing nations, various forms of privately funded higher education have emerged in competition with public education (which, in single-party Third World states, is still being used as a tool of propaganda and political indoctrination). Undoubtedly, a well-educated workforce is a key enabler in the Knowledge Economy, and private higher education can become an essential part of that key enabler. But the following questions should be noted: (i) how far can the private educational sector push its agenda of free access to information against the government apparatus in places where freedom of information and association is restricted as a matter of national or party policy?; and (ii) is private education itself a privilege reserved for those natives affiliated with Third World ruling elites?

Let's return to China as an example. The case of China -- a hybrid between a "superpower" and a developing nation – again deserves more elaborate comments. Although Shanghai-based economist Andy Rothman[217] noted that Chinese leadership has shown an appetite for making radical changes to the nation's economic and social structure, the authoritarian single-party regime does not foster genuine innovation; instead, it embarks on changes so long as

216. A New Economy? The Changing Role of Innovation and Information Technology in Growth, at 44-46 (OECD 2000).

217. *See* Notes 94-97, *supra (*referencing the works of economist Andrew Rothman).

those changes do not thwart the party's control.[218] World Bank experts have agreed with Rothman: despite her impressive economic growth, China's path to full development is hindered by her low overall educational attainment, meager indigenous innovation capacity, poor linkages between R&D and domestic industries, and weak legal institutions.[219]

Likewise, recent scholarly research portrays education in China as paradoxical: despite China's increasing expansionist dominance in the global scene, only a very small portion of China's population has a tertiary education. Yet, because of the enormous labor base, this small percentage of the population amounts to a substantial number. Compared to the OCED countries, the number of Chinese Ph.D.'s is still considerably low.[220] Economists have identified education and law as the two main culprits that retard China's development: China's rigid (rather than free-wheeling) education system impedes ideas, creativity, and innovation, and her legal system is arbitrary.[221] Among the areas that need improvement are the quality of education, assessment, qualifications and accreditation.[222]

According to World Bank experts, China needs a major breakthrough in closing gaps such as the "knowledge divide," the "access divide," the "digital divide," "educational inequality," "income disparity," and "discrepancies in health and medical care" between urban and rural areas, unemployment, lack of mobility in the labor market, and underperformance of the state sector. In the Western view, China needs to establish and enforce her regulatory framework, strengthen her rule of law, monitor and enhance government accountability, and in general unleash the human potential in order to boost innovation.[223]

Even if China may object to these reports as a form of "imperialism," the conclusions of these reports do confirm my general hypothesis: National FDI and technology policies must incorporate the improvement of tertiary education and workforce knowledge base. In the end, only educational opportunities can prevent the gloomy picture of an "international ghetto of unskilled workers"

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218. Clay Chandler, Chasing the Dragon, CNNMoney.com (March 19, 2007).
219. Douglas Zhihua Zeng & Shuilin Wang, China and the Knowledge Economy: Challenges and Opportunities, World Bank Policy and Research Working Paper 4223 (May 2007), *found at* http://www.wds.worldbank.org/external/default/main?page.
220. Schaaper, at 61.
221. Rothman, *supra;* Clay Chandler, Chasing the Dragon (March 19, 2007), http://chasingthedragon.blogs.fortune.com/2007/03/19/beyond-the-sweatshop-can-china-innovate/#comments (hard copy on file with author).
222. Zeng & Wang, supra.
223. Zeng & Wang, *Id.*

and no middle class.

On the other hand, a couple of country examples that contrast against China deserve attention. South Korea and Singapore, which did experience, in the past, authoritarian political regimes[224], succeeded, however, to reverse somehow the accumulative process of brain migration described above. This success could be linked to (i) these countries' respective national educational systems, including an emphasis on specialization in computer science and technology; (ii) their rule-of-law system that respects fundamental civil rights; and (iii) their national policy that enables expatriates who are scientific and managerial elites to return home to handle new economic and technological challenges. To be motivated to return home, expatriates must see the attraction of a civil society with good infrastructure and high standards of living, where the rule of law secures both economic freedom and civil liberty.

The case of India is a little different. The country has suffered from a huge brain migration of its scientific elites to the U.S. and Great Britain. Nonetheless, India has also developed a very strong university system. Despite the brain migration problem, the country has managed to keep a benchmark for excellence and a good R&D system very well connected to international research networks filled with Indian scientific expatriates. These expatriate networks do facilitate the gradual reversal of the cumulative "brain migration" process.

From the experience of these Asian countries, one can see the importance of a thoughtful national policy that creates, trains, and retains new classes of scientists, engineers and management professionals, including generalists who can integrate and disseminate Knowledge. That same policy should also cultivate local innovative projects, enable the return of foreign-trained expatriates, and create a strong international culture for the local community – one with the widest global network in which talents and multi-dimensional

224. South Korea and Singapore have each experienced an authoritarian political system. However, neither has been a totalitarian state where the entire society is ruled according to an ideological model that is a pure mental construction disconnected from reality: fundamental civil rights are suppressed; the civil society can be abolished according to party philosophy; economic, cultural, and educational activities are handled according to one single set of ideological standard; mass repression is used as predilection and means of "regulation;" and all three branches of government are under the control of one single party.(on totalitarianism, see Jean-Francois Revel, The Totalitarian Temptation (Penguin 1978); and Hannah Arendt, The Origins of Totalitarianism (Schocken 2004). In both countries, the economy receives a certain level of autonomy. Both countries claim to be democracies where fundamental civil rights are respected and the market economy is not under party control. Their political structure contrasts vividly from Vietnam, where the Communist Party is constitutionally proclaimed to be the "leading force of society" in control of all branches of government and the economy, although as a matter of party policy, the people are allowed certain degree of economic "laissez faire" to generate wealth and increase production. *See* CONSTITUTION OF THE SOCIALIST REPUBLIC OF VIETNAM (adopted by the Eighth National Assembly, in the 11th Session on April 14, 1992).

exposure to ideas can blossom to the fullest potential.

The Role of the Multilateral Institutions -- The Era of Change: Articulating its motto as "*Working for a World Free of Poverty*,"[225] the World Bank has long funded educational projects, from recent "Second Higher Education Projects" in Vietnam, Nepal, and Mazambique, to the "Third Programmatic Educational Sector Development Support Credit" in Bangladesh and "Reformed Management and Universal Teacher Upgrading" in Indonesia.[226] However, education has never been made part of the definition of "infrastructure development," which is a prime function of the World Bank group.[227] Nonetheless, the Bank recognizes that infrastructure development as a means to reduce poverty can "*indirectly*" be accomplished by "*access to other key resources such as schools, hospitals, and markets*."[228] Under this concept, infrastructure should legitimately encompass non-physical elements such as education, health care, and capital market structuring.

In addition to conventional infrastructure projects in energy, transportation, water supply and sanitation, urban services, power generation, and even oil and gas and mining, World Bank funding has also specifically been extended to high-tech telecommunication,[229] and more expressly to information and computer technology projects.[230] Examples in recent years include e-projects in Rwanda and Ghana; a "Knowledge Economy" project in Romania; other information, communication/telecommunications infrastructure and technology development projects in Mongolia, Nicaragua, Somoa, Vietnam, Kenya, Ethiopia, Tunisia, and the Eastern Carribean states.[231]

225. *See* World Bank website at http://www.worldbank.org/. The mission of the World Bank is "to help developing countries and their people reach the [Millennium Development Goals] by working with our partners to alleviate poverty. To do that we concentrate on building the climate for investment, jobs and sustainable growth . . . ."
http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/0,,contentMDK:20040565~menuPK:1696892~pagePK:51123644~piPK:329829~theSitePK:29708,00.html .

226. **For education projects funded with World Bank loans or credits, see** http://tinyurl.com/2dq8ds. *See also* http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,menuPK:34470~pagePK:117705~piPK:64255752~theSitePK:4607~topic:473881~topicMDK:473881,00.html.

227. **World Bank's lending for infrastructure projects amounted to $**8.1 billion dollars during 2006.
See http://tinyurl.com/yptucp; s*ee also*
http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:20127296~menuPK:34480~pagePK:34370~theSitePK:4607,00.html.

228. *Id.* http://tinyurl.com/yptucp. *See also*
http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:20127296~menuPK:34480~pagePK:34370~theSitePK:4607,00.html

229. **For World Bank infrastructure projects, see** http://tinyurl.com/yptucp.

230. **For World Bank loans for information computing projects, see** http://tinyurl.com/yvwmr9 and http://tinyurl.com/298tax .

231. *See* http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/0,,contentMDK:20687836~menuPK:282840~pagePK:210058~piPK:210

The Bank has also established the Global Information and Communication Technologies Department (GICT), which is a joint effort of the Bank and its commercial arm, the International Finance Corporation (IFC). Bringing together IFC's experience in private sector investment and the Bank's expertise in policy and regulatory matters, GICT considers as its mission the "*promot[ion of] access to information and communication technologies in developing countries*."[232] At face value, GICT provides governments, private companies, and civic organizations with the expertise and capital needed to reduce poverty and foster development. GICT also maintains close working relationships with other donors, NGOs, and a number of regional telecommunications associations and United Nations agencies such as the International Telecommunications Union. Activities of the GITC demonstrate the importance of technology on the Bank's agenda for the Third World. [233] The focus on human capital and the development of the labor workforce are also the impetus behind the "Sustainable Development" movement that has crossed its environmental law arena to enter the broader international law and economic development discourse. Now, Sustainable Development is also addressed specifically by the World Bank.[234]

According to World Bank websites,

(i) information, communication, and technology (ICT) is one of the best performing sectors in the World Bank group's portfolio, both in terms of returns and development impact;

(ii) to date, the Bank has supported reforms in over 80 governments and provided approximately US$750 million in loans for ICT projects, in addition to loans and credits extended to sectors such as health, education, trade, and

062~theSitePK:282823,00.html

232. *See information on World Bank's GICT at* http://tinyurl.com/29f39k.

233. *See* http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/0,,contentMDK:20687836~menuPK:282840~pagePK:210058~piPK:210062~theSitePK:282823,00.html.

234. *See* http://www.worldbank.org/sustainabledevelopment; *see also*http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/ORGANIZATION/EXTSDNETWORK/0,,menuPK:3167644~pagePK:64158571~piPK:64158630~theSitePK:3167628,00.html, and http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/0,,menuPK:282828~pagePK:149018~piPK:149093~theSitePK:282823,00.html.

"Sustainable Development" evolves from European forestry law and thus becomes part of international environmental law. However, international legal scholars have expanded the meaning of Sustainable Development to a broader dimension, focusing on human development by integrating social, environmental, cultural and economic development so that future generations of humans can meet their own needs (i.e., development is therefore sustained). Markus W. Ghering and Marie Claire Cordonier Segger, eds., Sustainable Development in World Trade Law 1-30 (Kluwer 2005). *Accord* Winfried Lang, ed., Sustainable Development and International Law (1994); Marie Claire Cordonier Segger and Ashfaq Khalfan, Sustainable Development Law: Principles, Practices and Prospects (Oxford University Press 2004).

finance, which have ICT components, bringing the total to approximately $1-1.5 billion;

(iii) trust funds administered by the International Bank for Reconstruction and Development (the "development bank" arm of the World Bank group) have contributed an additional US$50 million to the ICT sector in the past five years;

(iv) the IFC has provided approximately US$1.5 billion in financing to ICT companies in developing countries, in addition to another US$1 billion in IFC-supported private banks' loans made to this sector; and

(v) The Multilateral Investment Guarantee Agency (MIGA), the insurance arm of the World Bank group, has supplied an additional US$700 million to the ICT sector through private investment guarantees and political risk insurance to support FDI in the Third World.[235]

With the prospect of the new division of labor articulated in this Article, perhaps leaving GITC as a department and the ICT sector as one aspect of multi-lateral assistance may not be enough. Now is the time, perhaps long overdue, that the Word Bank (and its progeny -- the regional development banks and support organs) must *formally and officially* modify their role and mission to boost local R&D and tertiary education in the developing countries. The World Bank group's "post-World War reconstruction and infrastructure building" mission must be revisited the same way the international legal system must be revisited.[236] While the original "reconstruction" mission is still applicable for nation-building in places more recently devastated by wars (i.e., Afghanistan and Iraq), the new mission and role of the multilaterals should be recast to target concretely on education and informational infrastructure and the top priorities.

For example, in order to build a better partnership between the public and private sectors, in multilaterally financed projects, loan packages should include terms and conditions for fair and equitable technology transfers, local training, and research strategic alliances. These terms and conditions should be required of technology producers and service providers who earn their fees and profit from loan proceeds, the same way environmental impact studies have been made a condition for World Bank-financed infrastructure projects

235. *See* http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/0,,contentMDK:20687836~menuPK:282840~pagePK:210058~piPK:210062~theSitePK:282823,00.html.

236. *Id.*

for decades.

But most of all, correlation must be established between (i) the FDI-assisted programs by the World Bank group in the ICT sector described above, and (ii) reliable and verifiable poverty reduction data evidencing the current economic and human conditions of the Third Word. Such correlation will shed more light onto the changing role and impact of the multilateral institutions in the New Economy, and hopefully will point observers to the heart of the Third World development dilemma – that which lies within the Third World's borders. Below are some observations on the politics of the Third World as such possible root cause.

C. IN THE DOMAIN OF POLITICS – The Need for Reform

National integration of long-term educational policies into FDI and technology transfer policies. Support from the multilaterals such as the World Bank's activities described above will not be enough. Third World host countries must somehow turn both multilateral assistance[237] and FDI into educational opportunities for the native workforce. [238] More specifically, national FDI laws and investment policies must be coordinated and integrated with technology transfer, franchise and licensing regulations. The exchange of FDI situs for workforce education via training and technology transfer should intelligently be negotiated by Third World governments in their relationships with foreign investors, as complex commercial negotiations of the quid pro quo between the rich and the poor will lend themselves to unequal bargaining power.

Third World governmental policies should also foster and facilitate innovation from all angles. Input into the innovation process must include not only labor training, but also local R&D expenditures and activities.[239] The internationalization of R&D activities can happen in either profit-making

237. There is evidence that the international institutions and multilateral agencies realize the growing need and the problem – the World Bank has supported computer technology and educational projects to *See* World Bank Global Information and Communication Technologies Department, *found at* http://web.worldbank.org/wbsite/external/topics/extinformationandcommunicationandtechnologies/0,,menupk:282828~pagepk:149018~pipk:149093~thesitepk:282823,00.html. (last visited July 5, 2007); *Afshin Molavi,* "Supporting the Private Sector," Development Outreach, Fall 2001, *found at* http://www1.worldbank.org/devoutreach/fall01/article.asp? id=130. [CHECK]

238. Douglas Zhihua Zeng & Shuilin Wang, China and the Knowledge Economy: Challenges and Opportunities, World Bank Policy and Research Working Paper 4223 (May 2007), *found at* http://www.wds.worldbank.org/external/default/main?page (noting China's progress in upgrading her educational system, improving R&D expenditures, increasing patented ouputs and information infrastructure such as ICT access).

239. Schapper, at 61.

projects with foreign firms, or in non-profit research joint ventures or strategic alliances (leading to co-invention of patents).[240] As already mentioned, India has implemented this policy. Likewise, more recently, Cisco Systems of the U.S.'s Silicon Valley has opened a consulting office in Vietnam, in affiliation with Hanoi University, armed with the educational mission of assisting and investing in the Vietnamese "gray matter." The company sent a Vietnamese American engineering manager from its headquarters in San Jose, California, to head the consulting office, in hopes of training Vietnamese technocrats to meet Cisco's needs and to provide hands-on experience to Vietnamese students. The Cisco representative described Cisco's goal as training Vietnamese on a work culture that modeled after innovative America.

Between its inception in June 2006 and summer 2007, the consulting office trained about 100 computer science lecturers for Vietnam, and sent 10 outstanding students to study abroad so that "educational opportunities will not be limited to just the ruling elites" (quoting the Cisco representative). According to the representative, the company wants to make a long-term commitment to produce the "gray matter" for Vietnam, and to encourage local innovation. The ultimate corporate goal is to encourage local innovation while allowing the Vietnamese "gray matter" to develop institutional loyalty to Cisco.[241]

Cisco's decision should be examined in light of Cisco's experience with Vietnamese American IT personnel in the U.S. The end of the Vietnam War in 1975 occasioned the influx of Vietnamese into American society.[242] Many of these immigrants settled in the Silicon Valley, got the education, and went to work for high tech businesses there, including Cisco. These Vietnamese Americans serve as the "catalyst" that connects Cisco management to the workforce of Vietnam, thereby facilitating the corporate long-term vision of what Vietnam's "gray matter" can offer (so long as the country's goals and corporate goals can be chartered to coincide via the "catalyst"). In the case of Vietnam, the "catalyst" resulted uniquely from history, but the lesson learned is that somehow, Third World countries must design and implement national policies that give themselves the benefit of such "catalyst."

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240. Schaaper, at 58 (noting this trend in non-OECD economies).
241. Do Dzung, "Ph.D. Holder Christopher Pham Brings Gray Matter to Vietnam," Nguoi-Viet [Vietnamese People] Online Newsletter (www.nguoi-viet.com) (August 2, 2007).
242. Hirsch, Kett & Trefil, The Dictionary of Cultural Literacy, 2d ed. (Houghton Mifflin Co. 1993) at p. 302 (defining Vietnamese "boat people" as part of world politics).

Because methods of technology transfer and workforce educational opportunities, and development of the "catalyst" network are within the policy- and law-making power of the host country, the achievement of these goals will ultimately depend on the insight and foresight of Third World leaders. College exchange programs, careful screening of technology producers-licensors, and FDI requirements such as mandatory joint research and R&D strategic alliances will help build long-term partnerships and provide opportunities for ultimately strengthening the bargaining know-hows, skills, and innovation of local firms. The success of these alternative modalities in the New Economy will depend on Third World leadership.

The Role of Government and Prospect of A Rule-of-Law Society. The role played by Third World governments in the New Economy must also include the development of a rule-of-law system for their respective societies. Here lies another challenge, for a number of reasons. *First,* the political unrest and currency crises commonly observed in Third World countries renders the prospect of a stable rule-of-law system a utopia rather than a reality. *Second,* certain Third World cultures are simply not rule-based. *Third*, many Third World governments do not embrace a rule of law system that fosters freedom of ideas, as that is perceived as a threat to the ruling regime – it is understandable that dictators are not thrilled about opening the populace to freedom of access to information.

One specific problem with the present state of many Third World societies is the lack of transparency, governmental accountability, and a publicly available system of law reporting. A meaningful rule-of-law system must be consistently applied, uniformly documented, widely published, and logically interpreted. In this sense, WTO membership does help create transparency, at least with respect to trade matters – member countries are required to make trade rules as clear and public as possible, and many WTO agreements specifically require governments to disclose their policies and practices publicly.[243] But what good does it do to have these transparency requirements in trade rules if the general public does not have the sufficient knowledge to understand the rules and the

243. **Abdul Ghafur Hamid, The Law of the World Trade Organization: An Analysis from International Law** Perspective, 1 Asian J.Int.L 1, 6, Issue 1 (June 2006). At least one writer-specialist on Asian economies (e.g. China) has argued that the benefit of WTO membership lies in the government's self-imposed efforts to review its development strategy, to eliminate local protectionism to gain access to international markets, and to institute administrative reforms, including the reform of the State-owned sector. *See, e.g.*, Justin Yifu Lin, The China Miracle: How OECD Country Policies Contributed? (May 2004) (preliminary draft), prepared for the Conference "The Impact and Coherence of OECD Country Policies on Asian Developing Economies" (Paris June 10-11, 2004).

consequences thereof?.

Further, there is the obvious problem of a relationship-based culture where corruption is still prevalent.[244] The Third World is commonly known for its wide gap between the law on the book and the enforcement reality. More often than not, in the least-developed economies, relationships, connections, and the economic power of foreign investors govern the terms of business deals. Where national economic and commercial laws exist, they may be at odds with more universally observed legal concepts found in the developed jurisdictions, making Western legal imperialism a reality that cannot be avoided.[245] These legal gaps contribute to the further isolation of the disadvantaged.

Yet, crowded Third World cities may misleadingly bear the appearance of affluence created by (i) the flow FDI into these societies, and (ii) the superficial social infrastructure needed to support the spending and lifestyles of the exorbitantly wealthy "privileged few" in those urban centers. The appearance of affluence camouflages the living conditions of the lower echelon of the population, which ultimately reveal themselves in other social ills – from pervasive corruption in oil-producing Nigeria to the widespread trafficking of poor women and children from the countryside of Southeast Asia.[246]

The Root Cause: Change in the Political System of the Third World – Market Economy versus Political Democracy? In sum, many "Third World" economies may lack the efficiency based on a rule-of-law foundation necessary for the design and implementation of thoughtful educational and technology policies. I call this the "Law Gap." Questions must be asked whether this Law Gap bears direct relationship to the cultural, political, and power structure that shapes the way of life in those countries. Places such as China, Vietnam, Laos,

244. Transparency International, "Corruption Perception Index," http://www.transparency.org/ news_room/ in_focus/2006/cpi_2006__1/cpi_table (Last visited July 5, 2007).

245. Take the most fundamental example: the law of contract in Vietnam rests on principles that do not always parallel contract common law as we know it in the U.S. Nor is the contract law of Vietnam purely based on a civil-code system like many European countries. Vietnamese contract law is somewhat a hybrid creature – somewhere between a code of morality, social flexibility and remnants of a communist economic and political system. Dao Nguyen, "Vietnam: Update on Vietnamese Contract Law," http://www.jsm-law.com/live/Portal?xml=legal_update/article&content_id=2401 (Last visted July 5, 2007). *See also* Vietnam's Ordiance on Economic Contracts (Sept. 25, 1989) and Ordinance on Civil Contracts (April 29, 1991). Uniform commercial law and systems of commercial papers are still being formed but not all developed. The stock market and securities laws are at best embryonic. *See also* John McMillan & Christopher Woodruff, Courts and Relational Contracts, 18 J.L. Econ. & Org. 221 (2002); Dispute Prevention Without Courts in Vietnam, 15 J.L.Econ. & Org. 637 (1999); Interfirm Relationships and Informal Credit in Vietnam, 114 Q.J.Econ. 1285 (1999); Private Order under Dysfunctional Public Order, 98 Mich. L.Rev. 2421 (2000) (discussing and comparing contractual issues).

246. *See, e.g.,* Abigail Schwartz, Sex Trafficking in Cambodia, 17 Colum. J. Asian L. 371, 388-40 (2004).

and Myanmar are either single-party or police states.[247] More specifically, in Asia, history has proved that during the past century, Vietnam, the Philippines, Indonesia, and Myanmar all suffered enormous economic setbacks due to their respective political structure -- Vietnam was under Stalinist communism between 1975 and 1985, the Philippines under the Marcos regime, Indonesia under family-based political regimes that eventually led to political unrest,[248] and Myanmar becoming devastatingly poor under a military dictatorial regime. The Philippines and Indonesia, in particular, have become the situs for terrorist cells that feed on the poor's dissatisfaction with their society.

In the case of China and Vietnam, two heavily populated countries, the Law Gap has been a major impediment to the population's development path. In these two countries, lack of IPR enforcement, infringement of trade secrets, and a poor record of contract enforcement all hold back innovation or product and market development by both foreign firms and local talents. Another consequence of the Law Gap is the lack of private financing and venture capital to fund technology projects at the local level.[249] At the same time, a paradox exists in concepts of the rule of law in these two societies: the enforcement of criminal law to exert governmental power is iron-clad, with death sentences in place and enormous governmental powers for searches and arrests, all part of governmental efforts to silence oppositions, maintain public order and exert party control. Yet, law enforcement in civil relations and commercial matters in these two societies remains questionable, thereby undermining financiers' and investors' confidence. In contrast, Singapore and South Korea, which have an efficient rule of law system and long-term educational policies, have achieved social order, high standards of living for their people, and macro-economic success. Both countries claim to be democracies and not autocracies.

Questions, therefore, must be raised whether in many poverty-plagued Third World nations, leaving the rule of law to politics will just disintegrate a society already made worse by cultural and historical factors after years of civil liberty oppression. If people are "taimed" not to think in order to obey blindly because there is no rule of law to protect them, how can true innovation foster? Can the fruit trees of today's economic globalization be seeded on a ground that

247. Randall Peerenboom, Beyond Universalism and Relativism. The Evolving Debates About Values in Asia, 14 Ind. Int'l & Comp. L. Rev. 1, 49-72 (2003).

248. Robert Goldscheider, Expanding Role of Licensing in World, in the Law and Business of Licensing, Licensing in the 1990s, at 1650, ed. Jay Simon and Larry W. Evans (vol. II 1999 revision) (West). .

249. Zeng & Wang, *Id.*

lacks fundamental (yet universal) political and civil rights secured by the rule of law, among which freedom of speech and freedom of association?[250] If national sovereignty can justify the unequal endowment of political and personal freedom for the people, can there be equality in economic life?[251] The Third World must somehow join the global society by acceding to, and enforcing, a rule of law (rather than rule of man) system that represents "*general principles common to the major legal systems of the world*." [252]This is a reality that world leaders, international law- and policymakers, and "globalization"economic gurus cannot deny.

VII.
CONCLUSION

AI applications may be new, but their effect on labor division is not exactly a novelty. Any time society encounters technological changes that act upon productivity, an effect on the labor force, wealth distribution, and societal power structure will be felt, potentially leading to economic and political unrest. This was experienced during the 19th and 20th century industrialization. The development of the protective rule of law in response to these changes will always be after the fact. For example, the present labor law system, including aspects of collective bargaining law such as in the U.S., came into being long after the inception of the industrial revolution.

In sum, the power and wonder of AI has changed, and can further revolutionize our world. In the FDI domain, AI can stop the shifting of manufacturing to the developing economies by eliminating their "cheap labor" comparative advantage. Where such shifting of manufacturing still occurs due to other cost savings, investment strategies, and business goals, foreign investors' use of AI in the Third World may "ghetto" the native work force while fortifying the host country's "privileged few" – those who are chosen to

250. *See, generally,* Juan J. Liz & Alfred Stepan, Problems of Democratic Transition and Consolidation 7 (1996); The Global Resurgence of Democracy (Larry Diamond & Marc F. Plattner Eds. 1996).

251. *See* James L. Cavallaro & Emily J. Schaffer, *Less as More: Rethinking Supranational Litigation of Economic and Social Rights in the Americas*, 56 Hastings L.J. 217 (2004); Karen Engle, *Culture and Human Rights: The Asian Values Debate in Context*, 32 N.Y.U. J. Int'l L. & Pol. 291 (2000); Esperanza Hernandez-Truyol & Shelbi D. Day, *Property, Wealth, Inequality and Human Rights; A Formula for Reform*, 34 Ind. L. Rev. 1213, 1227-33 (2001); Daniel Warner, *An Ethics of Human Rights*, 24 Denv. J. Int'l L. & Pol'y 395 (1996).

252. Restatement (Third) of the Foreign Relations Law of the United States § 102 (1987) (Sources of International Law)

share in the knowledge base of foreign technology producers.

To avoid this gloomy picture, Third World leaders must take into account the reality of the New Economy and the aspirations of their people in devising and implementing significant structural changes. But that is to assume that Third World governments act in the best interest of the people. In many Third World environments, the power to change rests with the ruling elites. Yet, quite often, it is the Third World's ruling elites that create exclusivity of access, and perpetuate the "ghetto'ing" of their own people. Now, it is clear that the problem with the Third World is "Catch 22." *The chicken and the egg – which one comes first?* Perhaps this is the only idealistic justification for the superpowers' interventionist foreign policies, which at heart contradict and undermine principles of self-determination.[253] Can this mean that there will be no preventive solution unless political democracy is rooted in the Third World? After all, freedom of information, freedom of education, freedom of ideas and innovation, and a rule-of-law system are all products of democracy.

Perhaps it is not too cliché to say that in the dark places of the Third World where poverty, corruption, and dictatorship continue to define the lives of people, the seeds of the problem lie not with science, technology, AI, or FDI trends. The hopelessness lies with the political and cultural fabric of the developing nations, and with law- and policymakers who do not act in the interest of their people. Accordingly, political reform must first take place before hopes can be born.

In those dark places, hope means that somehow the pendulum of power must eventually revert back to the people. The people must be allowed to select their government, the kind of fiduciary government that can intelligently invest national resources in the education, liberty, creativity and productivity of its people. Otherwise, the people cannot earn their place in the Knowledge Economy. Changes must therefore take place from within. Without real internal political changes in the Third World, the future for a sophisticated AI-based civilization can just be more of a doomed fate for the poor and uneducated Third World inhabitants.

The problem is not limited only to the Third World.

The poet-philosopher Paul Valery has exclaimed that the human race now

253. *See generally* Ivan Eland, The Empire Has No Clothes: U.S. Foreign Policy Exposed (2004); Beyond Westphalia? State Sovereignty and International Intervention (Gene M. Lyons & Michael Mastanduno eds. 1995); Jennifer Insley-Pruitt, Book Annotation, 39 N.Y.U. J. Int'l L. & Pol. 729, 761-82 (2007); Kenneth D. Heath, *Could we have Armed the Kosovo Liberation Army? The New Norms Governing Intervention in Civil War*, 4 UCLA J. Int'l L. & For. Aff. 251, 282-305 (2000).

lives under a "*regime of surprise*."[254] To one of my former law students, such "*regime of surprise*" can mean the following: "*Tomorrow's society will consist solely of the extremely rich and robots…The rest of us will all have perished in the dark alleys of the global economy!*"

Her gloomy vision is exactly the reason why any regulatory solutions for the future must be based on the individual and humanism as the foundation of law, just as Paul Valery has stated:

"*The value of the person remains ultimately the essential foundation of every material creation and organization.*"[255] ### *WND copyright 2007*

Changes in FDI decisions

Good news for multinationals and investors!!!

WITHOUT ARTIFICIAL INTELLIGENCE	***NOW,*** WITH ARTIFICIAL INTELLIGENCE
All things being equal: ⇨ Manufacturing at home: too high a cost! ⇨ Business must go abroad to places where costs are low, in face of political risks or lack of regional consumer base. ⇨ Third World keeps its comparative advantage.	FDI decisions are easier: ⇨ Investor can stay home. ⇨ Or, investor will go only if foreign direct investment offers the highest profit: lowest costs and largest potential regional consumer base. ⇨ Third World loses its comparative advantage.

Chart 1: Changes in FDI decisions

254. "*Nous vivons sous le régime de la surprise….*" Paul Valery (1871–1945), was a French poet, essayist, and philosopher. His interests were sufficiently broad that he can be classified by contemporary researchers as a polymath. In addition to his fiction (poetry, drama and dialogues), he also wrote many essays and aphorisms on art, history, letters, music, and current events.

255. **Translation from Paul Valery's "A Look at our Present World" ("***Regards Sur Le Monde Actuel*"): "*…{L] a valeur de l'individu sera toujours en dernière analyse le support essentiel des valeurs de toutes créations ou organisations matérielles.*"

AI impact on the developing economies

Bad news for the Third World!

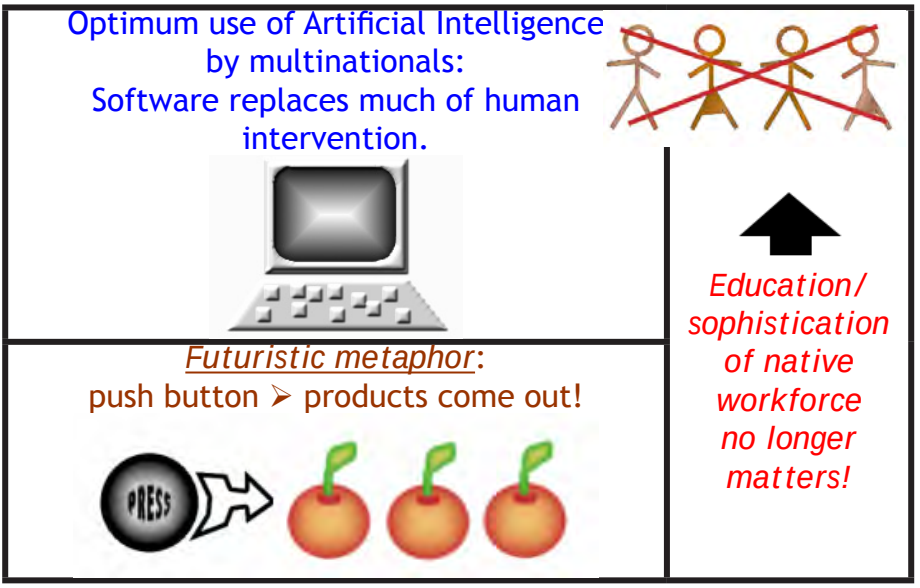

Chart 2: AI Impact on the developing economies

Artificial Intelligence -- changes to FDI choices and environments

✧AI eliminates much of human intervention by creating digital plants
✧AI replaces much of human production, manufacturing system design and implementation
✧ AI can alter outbound FDI trend, may stop capital outlay, technology transfer, and localization of training to the developing economies
✧ AI widens knowledge gap between ruling elites and bottom-level workforce

Chart 3: Artificial Intelligence -- changes to FDI choices and environments

AI impact on the native workforce

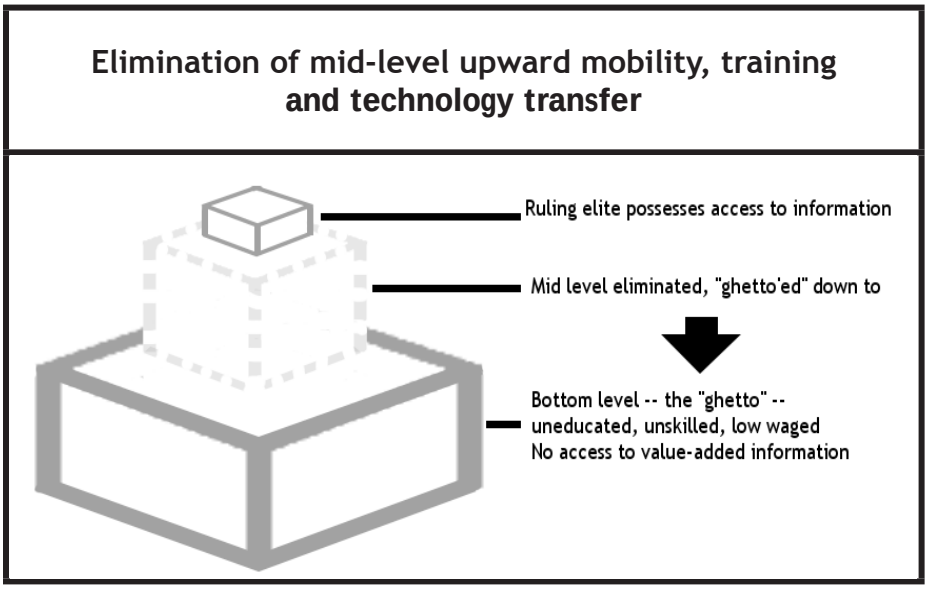

Chart 4: AI impact on the native workforce

Free trade and WTO membership for the Third World

✧*What good does it do for the "ghetto" to join the WTO?*

The perpetual imbalance:

Third World:	Developed World:
Providers of raw materials; consumers of hi-tech products	The superpowers: providers of hi-tech

Chart 5: Free trade and WTO membership for the Third World
