

# Three Taiwan-China Scenarios in the Age of Technological and Economic Integration: Economic Perspectives

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*This paper utilizes a scenario approach to study the alternative futures of supra-Taiwan-China structures in the age of international economic integration and atom-computer-gene technological integration. We anticipate that the preferable future of the supra-Taiwan-China economic structure is a transformed "world" in a time frame of the unbounded present. In this supra-structure of competition and cooperation, both Taiwan and China will benefit from the worldwide economic boom associated with the opportunity cost of moderately unequal degree of income redistribution.*

**Keywords:** integration, scenario, alternative futures, unbounded present.

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## *I. Introduction*

The economic relationship between Taiwan and China in the future is uncertain. Both Taiwan's new government (Democratic Progressive Party) and China's authoritarian communist government will face the challenges of this uncertain development. Both governments must sustain the rapid economic progress required to meet the rising expectations of their people in the coming new age. However, while the future is uncertain, the contours of the unknown can be articulated, that is, a range of alternatives can be explored, making the future, while unknown, not unknowable.

Current Taiwan-China cross-strait economic relations are full of contradictions and surprises; they are, in fact, full of paradoxes. In order to challenge the paradoxes, we must make at least a reasonable forecast about what the future holds, with and without our action. According to Hughes (1993), three general questions are crucial in understanding the future: (i) the future as where-where will current changes take us? (ii) the future as what-what kind of future do we prefer and what are the possible futures? (iii) the future as how much-how much leverage do we have to bring about the future we prefer?

The answer to the first question of the future presented in this paper is the irresistible trend of international economic integration and atom-computer-gene technological integration. To answer the second question, three alternatives are explored: market world, fortress world and transformed world. The possibility of transformation - the question of politics and the preferred image of the future - is generally based on the level of global competition-cooperation in the future.

The purpose of this paper - the core issue - is to help discern a preferable economic relationship between Taiwan and China. The remaining parts of this paper are organized as follows: Section II describes the trend of the international economic integration. Section III presents the wave of unprecedented change driven primarily by advances in quantum-computer-bio-molecular integrated technology. Section IV lays out the core concept of creating the future. Section V constructs three scenarios reflecting different conflicting worldviews. In the last section, the three global scenarios above are utilized to discuss three possible economic Taiwan-China futures.

## *II. International Economic Integration*

In his famous book, *The Economic Consequences of the Peace*, Keynes (1920) reminisced that the Englishmen of his time could order by telephone various commodities of the world, invest in far-off places, and arrange for international travels without even a passport. Yet in the 1920s Keynes was anticipating a period of economic turbulence and protectionism in the consequence of a devastating world war. Keynes' anticipation was correct and recognized as a lost era of great magnificence.

As pointed out by many economists, economic globalization has been an irresistible, indeed, irreversible, trend since the early 1980s. This vivid picture of economic globalization came into view again. The issue of how far this wave of economic globalization or international economic integration will go deserves closer scrutiny.<sup>1</sup>

The picture of international economic integration is to consider a world where markets for goods, services, and factors of production including knowledge and information are perfectly integrated. How far is the current status of the world economy from such a world? This question allows us to realize how deeply we are integrated into the world economy.

International economic integration is a process of eliminating restrictions on international trade, payments, and factor mobility. Economic integration hence results in the uniting of two or more national economies in a "preferential trade area." Krugman (1993) argues that if markets within a nation or between nations were perfect, then *laissez-faire* in general, and free trade in particular, would be Pareto optimal. However, it is clearly an untrue case in fact since markets are imperfect. Furthermore, the broad argument for free trade is essentially political: free trade is a pretty good if not perfect policy, while an effort to deviate from it in a sophisticated way would probably end up doing more harm than good.

In her paper, "Economic Integration: Conflict versus Cohesion," Collins (1995) observes a paradox: national authorities increasingly have control over policies that influence economic agents based in other countries when the global economy becomes more integrated. National authorities are often frustrated in their attempts to achieve national independence and self-reliance while striving to become more interdependent with the rest of the world; this observed mismatch may set the stage for increasingly contentious conflicts among nations.

Mishkin (1999) evidences that the global economy has experienced

severe bouts of financial instability that have had devastating impacts of crisis countries for the past five years. The global financial system does not perform well; accordingly, the international economy cannot operate efficiently and economic growth will be hampered. As a result, international investment portfolios in the advanced industrial countries exhibit large amounts of "home bias;" that is, people invest a higher proportion of assets in their countries than the principles of asset diversification would seem to suggest.

As mentioned above, it is a trend: economic activity has become increasingly international during the past two decades, as the world economy moves away from a set of national markets toward a global marketplace. How far are we presently from such a world? According to the previous arguments, we quote a statement from Rodrik (2000, p. 178), "The answer is that we are quite far. ... International economic integration remains remarkably limited." This quoted statement paves the way for forecasting the alternative futures and then the future of the international economic integration.<sup>2</sup>

### *III. Technological Integration*

Atom, computer, and gene are three great themes in science in the twentieth century. With our basic understanding of these three themes, the quantum revolution of unlocking the secrets of the atom is the first of these twentieth-century revolutions. The quantum revolution later helped to spawn the two other great scientific revolutions, the computer revolution of creating the electronic computer and the bio-molecular revolution of unraveling the genetic basis of life.

The quantum revolution has given us an almost complete description of matter, which allows us to describe the seemingly infinite multiplicity of matter we see arrayed around us in terms of a handful of particles. As pointed out by Kaku (1997), this revolution in the 21st century may open the door to the next step: the ability to manipulate and choreograph new forms of matter (nano-technology), almost at will.

The computer revolution has given us the ability to cram tens of millions of transistors into an area the size of a fingernail. This revolution in the 21st century may open the door to the next step: our life will be irrevocably changed when microchips become so plentiful that intelligent systems are dispersed by the millions into all parts of our environment. The bio-molecular revolution has given us the ability to

explain life as a genetic code written on the molecules within a cell. This revolution in the 21st century may open the door to the next step: the ability to read the genetic code of life as we would read a book; accordingly, give us the nearly god-like ability to manipulate life.

In the twentieth century, the fundamental functions of the three revolutions are utilized separately. This is because the reductionist approach has paid off handsomely, eventually establishing the foundation for modern physics, chemistry and biology. In this century, modern science is likely to integrate the quantum revolution with the computer revolution as well as the bio-molecular revolution. From reduction to synergy, the new relationships of the three revolutions can be treated as an intensely dynamic one. The so-called technological integration behind the quantum theory, computers, and molecular biology allows scientists to generally forecast the paths of scientific progress in the future. Of course, there will be unknowns, some of them quite serious, especially the consequences of manipulating the human genome. As we integrate further creating a technocratic world, chaos is likely to not decrease but increase. Indeed, the simulation imperative, that of attempting to simulate likely futures and impacts of technological innovation becomes even more important now.

However, divergences from known futures must be based on time horizons. Indeed, every technology has its own life cycle; accordingly, a time frame must be discussed in order to make reasonable forecasts about the future. The time assumed in this paper is framed between now and the year of 2020.<sup>3</sup> Within this time horizon, the two crucial technologies are expected to be computer power and DNA sequencing as pointed out by Kaku.

The acceleration of the technological integration of the quantum, computer and bio-molecular revolutions in this century will necessarily have huge repercussions on the wealth of nations, our standard of living, and the redistribution of wealth between developed and developing countries. To face these transformations and to possess the sources of comparative advantage under the vast repercussions from this initial wave of technological integration, many nations have drawn up lists of the key technologies to serve as the engines of wealth and prosperity in this and the next century.<sup>4</sup> No doubt, those key technologies are highly related to computer power and DNA, as well as new technologies yet to emerge from their synergies.

#### *IV. Unbounded Present*

The English language makes very clear distributions between the past, present and future. In fact, these three notions of time are highly interconnected. Human beings are not separate, isolated beings. As mentioned by Slaughter (1996), this non-isolated, but interconnected relationship is a process that weaves the present from the past and the future. The entire process has been called the "unbounded present", or the "eternal now", which is constructed by a "tacking" back and forth. Furthermore, the interconnections are even richer since the flow of the unbounded present is multidirectional. Boulding (1998) as well has articulated the 200 year present, stretching from grandparents to grandchildren - the seeable future.<sup>5</sup> The utility in studying the futures is that the present opens-up - alternatives become possible. By moving forward into the future, we notice foundational changes in technology and society. Scenarios or alternative futures change our decision context. Our assumptions to present and future are challenged. In Ozbekhen's sense (1960), normative forecasting is based on the concept of alternatives; strategic forecasting is based on the concept of choice.

Since the purposes of the field of futures studies are explored possible, probable, and preferable alternatives, it seems obvious that futurists must agree that forecasting in the multidirectional unbound present is one of their goals. A crucial recognition is that futurists can and do make predictive statement, but they cannot be certain that their predictions will be accurate. In order to increase the effectiveness of decision making, both normative forecasting (alternatives) and strategy forecasting (choices) must be performed. More importantly, in order to encourage responsible action, operative forecasting, in Ozbekhen's sense, must be performed.

As further pointed out by Slaughter, the more time invested in the concept of alternatives, in general, the richer are the available choice. Scenarios are one of the crucial tools to be used for this purpose. This paper utilizes a scenario approach to describe the possible alternatives of the unbound present that contain the frame of the technological and economic integration mentioned in the previous sections.

#### *V. Three Global Alternatives*

Revolutionary innovation now occurs in all scientific and technological fields. As mentioned in the previous section, this wave of unprec-

edented change is driven primarily by advances in the integrated science and technology of atom, computer and gene (the information and gene revolution). International economic integration also takes place all over the world. This is a problem-particularly so in a world that is becoming more complex, more unpredictable, and, because of technological integration, faster reacting. The following scenarios of normative forecasting provide a way of incorporating much more complexity into our view of the possible alternative futures and for creating a context to understand Taiwan's futures.

*Scenario I: Market World*

One possible future is grounded in the belief in the power of markets and of private enterprise to create prosperity and improve human welfare in the world. This market world scenario demonstrates that continuing the progress of the scientific and technological integration will both foster international economic integration and remove some of traditional obstacles (e.g. time, space, nationalism) to global government. As expected, free-market reforms have moved governments everywhere to downsize, deregulate, and privatize. The pace of innovation due to technological integration breeds new opportunities at astonishing speed.

Both international economic integration and technological integration will create a much more unequal income distribution among inter- and intra-countries. The market dominator, who owns the advanced technologies, easily creates and captures new opportunities. Eventually, McDonald or Sushi rather than Chinese cookie dominates the world because not all countries are equally prepared to succeed in the technology-integration age.

According to Kruger (2002), it is unlikely that the trends of global polarization and growing poverty will be reversed in the near future since the dominance of the rich countries is especially great with regards to the new technologies which will shape our future mode of production and exchange. Thus, in 1993 just 10 countries accounted for 84 percent of global research and development expenditures and controlled 95 percent of the US patents of the past two decades.<sup>6</sup>

According to Hammond (1999), given the market world scenario, we anticipate:

- i) This market world, characterized by a worldwide economic boom and unequal income redistribution, is expected to be of unprecedented breadth and longevity.
- ii) Most countries are integrated into the global market by the year

of 2020.

iii) A global currency will be modeled after the euro.

iv) There is increasing convergence in production methods and consumption patterns.

#### *Scenario II: Fortress World*

International economic integration can yield substantial benefits for the overall economy. International economic integration is the cause of global competition. We tend to describe this coming global competition as Europe versus the United States versus the newly industrializing countries. In fact, this is misleading because wherever you go in the world, you will find that companies rather than countries are wrestling with the problem of transforming their industries under the wave of technological integration. As pointed out by Hamel (1996, p.89), "I don't see competition as competition between nation states. I see it as competition between firms." Under the circumstances, specific groups might benefit if government provided them some relief from import competition.

Furthermore, markets cannot do everything, such as solve poverty and environment disasters. The global market boom remains highly concentrated. As pointed out by Hammond (1998, p.39), "Fewer than two dozen developing nations benefit to any significant degree from private investment, while in more than 70 countries incomes are lower now than they were in 1980."

International economic integration is preferred by most developed countries because they are able to utilize the integrated technology, which most developing countries do not have, to create their own comparative advantages. Most developed countries can enjoy a much greater degree of production scale stemmed from the integrated technology if their markets are allowed to extend internationally as well as globally. However, the conflicts between developed and developing countries may lead to a fortress world.

With respect to the international economic integration and issues of material well being, the market world scenario tends to emphasize economic growth. They chase greater domestic and international investment and improvements in economic efficiency. The fortress world scenario may also desire economic growth, domestically rather than globally, but places greater importance than the market world scenario on equality.<sup>7</sup> They often argue that households, firms, industries, or even entire countries are at a relative disadvantage in reaping the benefits of growth because of their



starting position in the economic system or status. They therefore prefer fortress world futures in which some compensation or even restructuring takes place to redress their own imbalances.

According to Hammond, in such a fortress world, we anticipate:

- i) Attention to social and environmental concerns declines.
- ii) Income and living conditions decline in many rural areas.
- iii) Health conditions in Asia and Latin America deteriorate.
- iv) Global organized crime grows.

### *Scenario III: Transformed World*

The transformed world vision of the unbounded present assumes that social and political changes as well as value and cultural-norm changes shape and supplement market mechanism. Given this vision, information is more accessible, power is more widely shared, and new grassroots coalitions shape what institutions and governments do, broadening the forms of governance. It is the transformed world that utilizes the market mechanism and private enterprise and integrates market incentives with social and environmental goals. This world accepts economic competition, but does not lose sight of the need for making deliberate social choices and meeting basic human needs. In other words, in tomorrow's global economy of a transformed world, there will be very tough economic competition, but the common environment will require global cooperation (Thurow, 1996, p.239). Competition and cooperation are full of contradictions and surprises, which they are, in fact, full of paradoxes. What paradox says to us is that two opposite thoughts and perspectives can both simultaneously be true. This is the fundamental spirit of the vision of the transformed world.

Obviously, both the market mechanism of the market-world scenario and the protectionism of the fortress-world scenario are not working the way we prefer they would. And, we are incrementally less able to influence them in the way we desire. Human beings organize themselves into not only economic but also political and social communities. Those communities interact with one another and with the broader physical and biological environment through economic (international economic integration) and technological (atom-computer-gene integration) activity. Accordingly, the transformed-world scenario can be explained by Rothschild's bionomics (1990). Rothschild argues that a market economy works not like a machine but an evolving ecosystem: "Just as biology studies the evolution of genes, organisms, and the ecosystem, bionomics studies the evolution of technologies, organization, and the economy."

(Petersen, 1994, p.266). From bionomics, we can anticipate a new technological revolution, based this time, not on the manipulation of nature, but technologies that are based on nature - Gaian friendly technologies, or Biometrics.<sup>8</sup>

According to Hammond, in a transformed world, we anticipate:

- i) A radical shift in environmental thought results in agreement to cut greenhouse gas emissions in half over a 30-year period.
- ii) A religious revival emphasizes family tie and social ministry.
- iii) Industries adopt voluntary codes of conduct for social and environmental matters.
- iv) Democratic forms of government become almost universal.

#### *VI. Three Alternatives of Economic Relationships between Taiwan and China*

The major economic problem of the future stems from the fact that we do not know how economies actually perform. This is because the economic jungle is teeming with uncertainty, unpredictability, and chaos. The scenario approach through normative forecasting provides a way of incorporating more complexity into our view of possible alternative futures. Three scenarios of market, fortress, and transformed worlds mentioned in the previous section are utilized to discuss the alternative futures of Taiwan. This paper limits itself to portray these three scenarios within the Taiwan-China economic frame since Taiwan's future highly depends on future developments between Taiwan and China.

The market-world scenario of an unmanaged future is based on the laissez-faire philosophy where Taiwan and China have always taken care of themselves and always will; hence, there is no perceived need for purposeful action. This scenario portrays a Taiwan-China economic environment of increasing instabilities that is unable to cope with their resolution even though one-China policy is neglected in this scenario of market-world framework.

The future managed by the market mechanism inevitably creates an income redistribution effect in the Taiwan-China frame. Relatively speaking, Taiwan is much more capable of coping with today's events of international economic integration and atom-computer-gene scientific and technological integration. Under these circumstances, producers in Taiwan and the consumers in China are expected to gain in terms of wealth creation. However, consumers in Taiwan and producers in China

are anticipated to be hurt in terms of welfare analysis.

The fortress-world scenario of a government-managed future does attempt to cope with the mushrooming crisis of increasing instabilities in Taiwan and China. This scenario allows both the authorities of Taiwan and China to take center stage as the decisive actors - instead of market it is polity that is far more important. It is also possible that authorities from both nations do not wait until the roof falls in before they take determined action. If both the authorities, separately rather than simultaneously, take action on their own, they may avert the mushrooming crisis in the short run, but may cause a much more severe storm in the long run. After all, the economic jungle is unpredictable. Under the circumstances, economic and/or military war may be inevitable. Both Taiwan and China will aggressively make use of the integrated atom-computer-gene technologies to take lead advantages of these two wars. The result will be both Taiwan and China losing their comparative advantages in the international economic-technological integrated world.

The transformed-world scenario with the strategic forecast of a competition-cooperation future does attempt to cope with increasing economic instabilities in the market-managed mechanism as well as the political instabilities in the government-managed mechanism in the region of Taiwan and China. The most preferable future in the context of operative forecasting is that we shall see an alliance of convenience in favor of "global (plain Taiwan-China)" governance between those who perceive themselves to be the "losers" from economic integration and those who perceive themselves to be the "winners".

The alliance of the plain Taiwan-China relationship will be underpinned by the mutual realization that both sets of economic interests are best served by the supra-Taiwan-China promulgation of rules, regulations, and standards. Note that the supra-Taiwan-China federalism does not mean that the United Taiwan-China will turn itself into a "national" government. What we are likely to get is a combination of traditional forms of governance. In the integrated atom-computer-gene age of rapid economic and technological change, the form of governance itself can be expected to be subject to considerable innovation. In consequence, the bionomics of the supra-Taiwan-China structure stemming from the transformed-world scenario is the evolution of competition and cooperation. It is crucial that scenarios be developed as to how this transformed world may look like. This is not just important to us to better understand decisions being made today but to create an alternative image of the future, a vision toward which China and Taiwan can

both move toward.<sup>9</sup>

On a personal note, I am optimistic that most human societies, including Taiwan and China, will find the will and creativity to overcome the challenges they face and to set up trajectories into the vivid future that has more resemblance to a transformed world than to a fortress world. This preferable competition-cooperation frame in the future is neither inevitable nor easy, since it depends on Taiwan-China choices still to be made.

Reflecting on the future, analyzing the future and developing simulation models can certainly help us forecast the future, the unknown through scenario development can be contoured. However, this is neither crucial nor decisive. What is more important is the envisioning of preferable futures we desire and taking concrete steps to realize the preferred vision. In a transformed Taiwan-China World, I anticipate and hope:

- i) Both Taiwan and China will benefit from the worldwide economic boom associated with the opportunity cost of moderately unequal degree of income redistribution.
- ii) Both Taiwan and China will be integrated into the regional and global market by the year 2020.
- iii) A “Chinese” currency will be modeled in Taiwan and China.
- iv) There is increasing convergence in the standard of living in Taiwan and China.

### *Notes*

1. According to Rodrik (2000), I will use the term “international economic integration” rather than “globalization” for two reasons. First, while not as trendy, my preferred term has a distinct meaning that will be self-evident to economists. ... Second, the term “international economic integration” does not come with the value judgements — positive or negative — that the term “globalization” seems to trigger in knee-jerk fashion. In this paper, we are informal and use those two terms synonymously.
2. Forecasting alternative futures is a normative forecasting; forecasting the preferred future is strategic forecasting; to make this preferable coming true is an operative forecasting. These three crucial forecasting concepts mentioned by Ozbekhen (1960) will be explained in the following section of the unbounded present.

3. As pointed out by Kaku (1997), there are not absolute time frames. This time frame utilized in this paper represents only the general period in which certain technologies and sciences will reach fruition. Furthermore, the time horizon between now and 2020 is a concept of unbounded present in Slaughter's sense (1996) rather than future itself. This concept will be discussed in the following section.
4. For example, as pointed out by Kaku (1997, p.13), "A typical list was compiled in 1990 by Japan's Ministry of International Trade and Industry. That list included the following:
  - microelectronics
  - biotechnology
  - the new material science industries
  - computers (hardware and software)
5. See Boulding, E. (1998) "Image and Action in Peacebuilding." in S. Inayatullah, and P. Wildman, ed.. *Futures Studies*. Brisbane: Prosperity Press.
6. Kruger, L. (2002) "North-South Relations." in K. Rosner, ed.. *Unesco Encyclopedia of Emerging Life Support Systems*. Paris, Forthcoming.
7. As pointed out by Hughes (1993), greater equality is not necessary to limit the increasing income, but seen as part of a broader phenomenon called development, involving widespread improvements in the quality of life. This paper is limited to the analysis of economic equality.
8. For more on this, see Fricker (2000).
9. See Galtung and Inayatullah (1997) for a general discussion on the rise and fall of civilizations, nations and epistemes.

## References

- Boulding, E. 1998. "Image and Action in Peacebuilding." in S. Inayatullah, and P. Wildman, ed. *Futures Studies*. Brisbane: Prosperity Press.
- Collins, S. M. 1995. "Economic Integration: Conflict versus Cohesion." *American Economic Review*, Papers and Proceedings 85(2):307-311.
- Fricker, A. 2000. "Genetics or Biometrics." *Journal of Futures Studies* 5 (1): 31-45
- Galtung, J., and S. Inayatullah 1997. *Macrohistory and Macrobhistorians*. Westport, CT.: Praeger.
- Hamel, G. 1996. "Reinvesting the Basis for Competition." in R. Gibson, ed. *Rethinking the Future*. London: Nicholas Brealey Publishing. Pp.76-92.

- Hammond, A. 1999. "3 Global Scenarios: Choosing the World We Want." *Futurist*, April 38-43.
- Hughes, B. B. 1993. *International Futures, Choices in the Creation of a New World Order*. Boulder: Westview Press.
- Kruger, L. 2002. "North-South Relations." in K. Rosner, ed. *Unesco Encyclopedia of Emerging Life Support Systems*. Paris, Forthcoming.
- Kaku, M. 1997. *Visions-How Science Will Revolutionize the 21st Century*. New York: Anchor Books.
- Keynes, J. M. 1920. *The Economic Consequences of the Peace*. New York: Harcourt, Brace, and Howe.
- Krugmm, P. R. 1993. "The Narrow and Broad Arguments for Free Trade." *American Economic Review, Papers and Proceedings*. 83(2): 362-366
- Mishkin, F. S. 1999. "Global Financial Instability: Framework, Events, Issues." *Journal of Economic Perspectives*. 13(4):3-20.
- Ozbekhen, H. 1960. *The Triumph of Technology: Can Implies Ought*. Santa Monica: Rand Corporation.
- Rothschild, M. 1990. *Bionomics*. New York: Henry Holt & Co.
- Rodrik, D. 2000. "How Far Will International Economic Integration Go?" *Journal of Economic Perspectives* 14(1):177-186.
- Petersen, J. L. 1994. *The Road to 2015-Profiles of the Future*. CA: Waite Group Press.
- Slaughter, R. A. 1996. "Futures Concepts." in R. A. Slaughter ed. *The Knowledge Base of Futures Studies*. Australia: DDM Media Group. Futures Study Center. Pp.86-124.
- Thurow, L. 1996. "Changing the Nature of Capitalism." in R. Gibson, ed. *Rethinking the Future*. London: Nicholas Brealey Publishing. Pp.228-249.