Are the Geese Still Flying? Catch-up Industrialization in a Changing International Economic Environment
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We gratefully acknowledge The Kiriyama Chair for Pacific Rim Studies at the USF Center for the Pacific Rim for underwriting the publication of this issue of Pacific Rim Report.

Kaname Akamatsu (in 1935)[1] introduced the now famous metaphor of flying wild geese, to depict the catching-up process of post-war industrialization in Japan—a model successfully emulated by the East Asian ‘miracle’ economies, bringing hope to many other developing countries in Asia. In that paradigm sequential shifting of comparative advantage across economies, aided by factors such as foreign direct investment, structural change, infrastructure development, human capital formation, and industrial policy, unleashed trade-fueled economic development.

In the 1990s a new international division of labor took shape, based on the principles of the supply chain. The international economic landscape changed significantly, with international product fragmentation, agglomeration economies, intra-industry and intra-product trade, regionalization, the emergence of two giant economies, China and India, as dominant forces, and the appearance of many new players eyeing the field, including lower tier Southeast Asian economies.

In this paper I discuss some aspects of this changing international economic context and the relevance of the process of sequential shifting of comparative advantage as a basis for industrial upgrading. Is catch-up industrialization still at work? In that sense,[2] are the geese still flying?

Flying Geese
Akamatsu (1962) presented the flying geese pattern of industrial development as “a sort of formula for the industrial development of less-advanced countries after they have opened trade ports and entered into large-scale trade relations with the advanced Western European countries.”[3] Trade liberalization, in this paradigm, ushers the following process for manufactured goods. First imports increase, but as domestic production capabilities arise, imports diminish and eventually the imported goods become export goods. In other words, import-substitution is successfully followed by exports. The time series curves of imports, domestic production, and exports exhibit the inverse V shape similar to the formation of flying wild geese, as shown below for Japan for the period between 1870 and World War II.[4]

Akamatsu (1962) described three forms of the flying geese pattern: [1] with respect to manufactured consumer goods (which he termed the “fundamental wild-geese flying pattern”), [2] with respect to quality (the “wild-geese-flying development pattern from crude goods to elaborate goods”), and [3] with respect to economies (the “development of advanced and less-advanced...
countries in a flying-wild-geese pattern.” The first pattern presents an inter-
industry shift in products, from consumer to capital goods (e.g. textiles to
machinery); whereas the second, an intra-industry shift to more complex and
refined goods (e.g. superior quality textiles). The ‘flying geese’ in these two
patterns are firms—a lead firm in an advanced economy, and followers in less
developed economies—and the process is one of successful transition from
import-substitution to export-promotion based on learning-by-doing in the lap
of infant-industry protection. The third pattern refers to an economy-wide
shift—the transformation of entire economies up the industrialization ladder,
from dominance of the primary sector, to labor-intensive, then to capital-
intensive, and ultimately to the knowledge-intensive industrial sector. The
flying geese here are economies; the less advanced trailing the advanced lead
economy.

In other words, catch-up industrialization can take three forms—producing
more capital-intensive goods (i.e. capital-intensity upgrading), producing higher quality and more complex goods (i.e. quality upgrading), and
eco

The key to a successful catching-up product cycle development was long run decreasing costs of the nature clearly revealed for steel,
avtomobiles and so on. Foreign direct investment and technological knowhow were certainly important but the technological adaptability,
active management and industrious skill of the Japanese were much more important. Foreign technology was often amended and assimilated
ina way which made its application in Japan more efficient. [6]

Also noteworthy were the networks of linked firms:
Japan’s unique trading firms played an important role in the expansion of trade. Their hundreds of subsidiaries and branches throughout the
world were able to identify where Japan’s comparative advantage lay, and to participate substantially in Japan’s direct investments
abroad. [7]

With particular reference to Japan’s position as head goose, a crucial factor was its ability to invent and innovate, or, in Kojima’s terminology,
its shift from engaging in catching-up product cycles to creating its own product cycles.

The four East Asian NIEs (the newly industrializing economies of South Korea, Taiwan, Hong Kong and Singapore) followed Japan so well,
and ‘flew’ in such elegant formation, that their industrialization and growth was dubbed a ‘miracle’. Many factors combined to facilitate East
Similarly, Koopman information products are assembled not by Chinese-owned firms but by foreign firms that are using China as an export platform. It is doubtful that China is supplying anything but the labor required to produce these goods. China's provision of relatively low-wage labor is losing competitiveness in countries that are slightly further along in terms of economic development but have similar factor endowments and economic environments. Regional development, whether in nineteenth century Europe or in Asia in the 1980s, benefits from the market pressure and lessons learned from neighboring countries.

Deciding which industries to promote might seem a serious problem. However, it is not difficult for a developing country to pick an industry that is losing competitiveness in countries that are slightly further along in terms of economic development but have similar factor endowments and economic environments. Regional development, whether in nineteenth century Europe or in Asia in the 1980s, benefits from the market pressure and lessons learned from neighboring countries.

The intervention schemes have worked closely with the market, and the state’s alertness in using the signals emanating from world markets to judge dynamic efficiency has helped keep firms on their toes and prevent infant industries from turning into inefficient geriatric protection lobbies. [...] The other aspect of the quality of intervention that matters a great deal is the selectivity of intervention (in terms of strategic sectors, products and processes in the different stages of early industrialization). Such selectivity in targeting, as opposed to indiscriminate and blanket controls and regulations, saves on scarce administrative skills and makes it easier to pinpoint social costs of policies and adjust them in response to changing technical and market conditions.

‘Advantages of backwardness’ played its role too, with advanced economies as trailblazers for the less developed.

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Trade-oriented foreign direct investment from Japan contributed, aiming at economic activities in which Japan was becoming comparatively disadvantaged (natural resource development, textiles, clothing, steel processing and electronic components). Such complementarity strengthened comparative advantage in investing and receiving countries alike. It created export capacity in developing countries while obtaining necessary imports for the more developed economy and accelerating internal structural adjustment.

The East Asian success further inspired catch-up development in Malaysia, Thailand, and Indonesia, and to some extent, in the Philippines. Growth was less miraculous, but take-offs in Southeast Asia were based on similar factors that enabled the ‘Tigers’ (South Korea, Taiwan, Hong Kong, and Singapore.)

Thus, the geese flew, from Japan to Northeast Asia to Southeast Asia, riding ever-increasing waves of FDI in search of lower cost production. Opening its doors, China joined in, and amazed the world with its ‘flying power’.

A Panda among the Geese? – the Rise of China

“China is no goose,” The Economist opined in 2001. “It does not conform to the …. stereotype, because it makes simple goods and sophisticated ones at the same time, rag nappies and microchips.” Others have observed the steady rise in the level of sophistication of Chinese exports, noting the similarity of China’s exports to those of much higher income-level economies. It appears that China has disrupted the orderly arrangement of East Asian catch-up industrialization:

With its economies of scale and other advantages, it has leapfrogged up the technological ladder. No other country in East Asia has the capacity to produce at all points between the lower and upper ends of the technology spectrum.

Thus, China has been seen as having the potential of dislodging all types of geese—the leading (Japan), the middle of the pack (Singapore, Hong Kong, South Korea and Taiwan), and the trailing (Thailand, Malaysia, Indonesia, and the Philippines).

However, before accepting the ‘leapfrogging thesis’ one must keep the extent of inward processing trade in mind, i.e., that a large proportion of industrial economic activity in China consists of assembly of imported components for re-export. Lardy (2006), e.g., argues that the exports of electronic and information technology products from China are mostly simply assembled high value-added parts and components with only 15 percent domestic value-added. “China, in short, does not in any real sense manufacture these goods.” And “for many of these products it is doubtful that China is supplying anything but the labor required to produce these goods. China’s provision of relatively low-wage ‘assembly services’ is completely consistent with its underlying comparative advantage.” Further, “most exports of electronic and information products are assembled not by Chinese-owned firms but by foreign firms that are using China as an export platform.”

Similarly, Koopman et al. (2008) estimate that whereas the foreign content in Chinese exports overall is close to 50%, there is notable heterogeneity across sectors: Those sectors that are likely to be labeled as sophisticated or high-skilled, such as computers, electronic devices, and telecommunication equipment, tend to have especially low shares of domestic content. Conversely, many sectors that are relatively intensive in low-skilled labor, such as apparel, are likely to exhibit a high share of domestic content in China’s exports. Finally, ... foreign invested firms (including both
wholly-owned foreign firms and Sino-foreign joint venture firms) tend to have a relatively low share of domestic content in their exports.[17]

Studies[18] have also noted that, within detailed products (e.g. shirts as opposed to apparel), China and other developing countries are found to export less expensive and lower quality varieties relative to the more developed economies.

An important issue at hand is that conventional trade statistics can be misleading. For example, Linden et al. (2007) calculate, “For every $300 iPod sold in the U.S., the politically volatile U.S. trade deficit with China increased by about $150 (the factory cost). Yet, the value added to the product through assembly in China is probably a few dollars at most.[19]

As Roland-Holst (2004) has argued, “the de facto regional hierarchy of value-added in East Asia has not been substantially altered. Indeed, the most skill-intensive exporters, Japan and the NIEs (newly industrializing economies), have actually intensified their ‘skill specialization’ over the period 1996–2000.”[20] In fact, Most countries have [...] found a niche in which they may retain competitiveness relative to China. .... countries have the choice of (1) investing in China and selling to China or world markets; (2) exporting components to China and making it the assembly plant for exports to others; or (3) exporting raw materials to China. The United States and the European Union are focusing on the first channel. The four tigers and the more industrialized countries within ASEAN are focusing on the second. The less developed countries that possess natural resources are focusing on the third.[21]

Japan, for example, has competitive advantage not only in frontier manufacturing technology but also in creativity in other sectors as well. “The strength of Japanese companies is not just technological sophistication. Goods and services such as pop culture, convenience stores, and fashion, which had been developed for and won the hearts and minds of selective and capricious Japanese consumers, started to attract the rapidly emerging middle class in China.”[22]

Going back then to Akamatsu’s three forms of catch-up industrialization—capital-intensity upgrading, quality upgrading and economy-wide technological upgrading—China is very much still on the way up the ladder; albeit a very certain, steady, and rapid way up.

All the World’s a Factory – ‘Flying’ Direct Investment

In 2003 Yoshimatsu wrote, “Japan was the factory of the world in the 1970s and 1980s. China is succeeding this status in the new century.”[23] By 2007 Gill et al. concluded, “No single county within East Asia can dominate the production chain”. [24]

Over the last two decades, a whole new mode of global production sharing has evolved.

Intensified technological advancement (particularly in information, communications and transportation technology) and trade liberalization have fundamentally altered the structure of foreign direct investment and foreign trade. Earlier, entire product lines shifted production. Now deverticalization by firms has created extensive international production networks of supply chaining. These networks include cross-border relationships between lead firms and their affiliates and subsidiaries, subcontractors, suppliers and service providers.[25]

International product fragmentation is a vertical disintegration process wherein various components of a product are produced in different plants located globally, i.e., offshoring. A product is designed and engineered in one country, its components manufactured in many countries, and its assembly finished in yet another country before it is sent off to distribution channels. Computers, for example, are designed in the U.S., but hard disks, monitors, keyboards, etc. are produced in several different countries. Such intra-product specialization has resulted in a proliferation of complex webs of global supply chains in many industries such as automobiles, aircrafts and apparel (so that even a shirt label may often only claim, “assembled in Mexico”.)

Global production networks enable lead firms to source low-cost inputs and skills while specializing in core expertise. This enables a much finer division of labor and, therefore, many more participants in the supply chain. The figure above depicts a generic electronics supply chain.

In global production networks, the separated activities are coordinated by service links, as shown in the figure below. The greater the product fragmentation, more complex is the coordination.

These links encompass a whole host of functions including demand forecasting, inventory management, marketing, distribution, telecommunication, and transportation. Thus, expanded sources of value added are available to private enterprise. In the apparel and shoe industries, e.g., as production has relocated to China, Taiwanese firms have moved on to supply chain management. Their expertise is to “locate suppliers in China, monitor the quality of their work, transmit orders and deal with buyers, organize shipments, and sometimes engage in rudimentary marketing.”[26]
The deeper vertical specialization in global production networks has increased the scope of activity-level economies of scale. From product development, to input (in particular, labor) sourcing, to marketing, producers can spread fixed costs over larger volumes of production, enabling per unit costs to fall steadily as the scale increases. With intra-product specialization, smaller firms can reap scale economies. Further, as a particular production activity gains ground in a particular location, it triggers complementary specialization in the vicinity, and agglomeration economies take effect, giving rise to industrial clusters (i.e. geographic concentrations of interrelated businesses and institutions in a particular field) and labor pools.

With expanded opportunities there are also new challenges. Competition is more intense. Efficiency-attributes such as on-time delivery, quality control and flexibility take on added significance when activities are part of supply chains. Global product fragmentation has intensified, more than ever before, the ‘flying nature of foreign direct investment’, i.e., its footloose nature of reallocating itself to the most advantageous international location. “CPNs (cross-border production networks) are assembled to access vocational advantages at each network node associated with the increasingly specialized technology, skills and know-how that are resident there.”[27]

In Asia, the stage for the spread of global production networks was set by ‘flying geese’ from Japan to the rest of East Asia and onward to Southeast Asia. Japanese keiretsu and Korean chaebol were tightly knit networks of production and distribution. Japanese outsourcing, first in the Tiger economies and then in the middle-income ASEAN countries and China, was joined by foreign direct investment from the U.S. The Asian diaspora played its role, setting up plants and distribution links back in home countries. Managerial innovations such as the Toyota Way and distribution innovations such as the Li and Fung Global Distribution System, led the way. Clusters of production, and research and development emerged. Regional cascade effects ensued. Aided by factors such as rapid advances in telecommunications and logistics, congenial economic policies and social networks, efficient East Asian firms became integral members of global production-sharing networks, making the region a substantial and vibrant part of the world factory.

**Flying in a ‘Flat’ World— Innovation, Education, and Infrastructure**

A flat world is one where geography is irrelevant—for our purpose here, to the location of operation decisions. With the dramatic progress in information and communications technology mentioned above, production activity has come to be allocated worldwide, guided by comparative advantage, and more and more types of production activities have become footloose, ranging from routine, standardized manufacturing tasks to financial and legal services. *The New York Times* recently reported “knowledge process outsourcing,” or “high-value outsourcing” of Wall Street jobs to India, citing, “Over all, United States banks will cut 200,000 employees by 2009, the banking consultancy Celent said in April.”[28]

In a thought-provoking and entertaining review of Thomas Friedman’s *The World is Flat*, economics professor Edward Leamer (2007) reminds us why geography remains relevant (and why we should not let our “spirits be flattened!”)[29] He emphasizes that geography can be physical or cultural or informational. Hence we like local newspapers, music, and theater, and even websites from nearby countries[30]. And there are agglomeration externalities, which is why clusters succeed—movies in Hollywood, jazz and finance in New York City and high-tech in Silicon Valley. In fact, “the most globalized firms depend heavily on capacities that benefit from local agglomeration economies.”[31] Comparative advantage and specialization are localized phenomena, and often occur in economic clusters. “Of course, standardization, mechanization, and computerization all work to increase the number of footloose tasks, but innovation and education work in the opposite direction, creating relationship-based activities.”[32] Sustaining high flying requires retaining “the immobile assets—the researchers (not the research), and infrastructure, including the parks and public spaces that these highly paid knowledge workers enjoy;”[33] indeed, it requires continuously developing created assets such as knowledge workers, intellectual property and business infrastructure.

Innovation is an important determinant of the value-added ladder in a supply chain. At the apex are the lead firms, with design, management and marketing skills, creating high value through intellectual property and brand reputation. And at the bottom are the suppliers of generic inputs, contributing little to innovation, competing with close substitutes and earning lean profit margins. As an example of the returns on innovation, consider the iPod:

*The iPod, like many other products, is made in several countries by dozens of companies, with each stage of production contributing a different amount to the final value. ... The real value of the iPod doesn’t lie in its parts or even in putting those parts together. The bulk of the iPod’s value is in the conception and design of the iPod. That is why Apple gets $80 for each of these video iPods it sells, which is by far the*
How has the rapid spread of globalized supply chains affected the pace of globalization of innovation? After all, we can expect a complementarity between innovation and production—“ongoing cost-reducing process innovations can only be made by those who are actually producing the product.”[35] Based on a collection of studies of ten global industries (personal computing, software, semiconductors, flat panel displays, lighting, pharmaceuticals, biotechnology, logistics, venture capital, and financial services), Macher and Mowery (2008) conclude that indeed, since the 1990s, there has been a significant growth in innovative capabilities in countries like China, India, South Korea and Taiwan, which was linked to the growth there of production, either manufacturing, or in the case of India, software and services. And agglomeration economies have resulted in successful high-tech clusters—in Shanghai, Bangalore, and Hsinchu. While the U.S. still retains leading-edge capacity in most industries studied (with the exceptions of lighting and flat panel displays) a substantial international division of labor has developed in innovation-related activities. Taking personal computers, e.g., “the global division of innovation-related activities within the industry is characterized as follows: component-level R&D (concept design and product planning) is performed in the United States and Japan; applied R&D and development of new platforms (particularly notebook computers) take place in Taiwan; and product development for mature products (mainly desktop computers) and a majority of production and sustaining engineering are performed in China.”[36]

Figure 4: The new global division of labor in the PC industry

The figure at left clearly shows sequential shifts in activities—catch-up industrialization is at work guided by shifts in competitive advantage. Industries and activities in which U.S. workers (defined in this case to include scientists and engineers) add less value are the most vulnerable to foreign competition and the most likely ones to move to foreign sites. The improved capabilities of scientists and engineers in many of these foreign locations, the identity of these locations themselves, and the changing outlook of demand and growth in the U.S. and foreign markets, however, may be causing more rapid shifts in competitive advantage and affecting a broader range of activities, including innovation-related activities, than in earlier decades.[37] Within East Asia, high-income economies like Korea, Singapore and Taiwan “now conduct formal R&D and patenting at the levels of the most advanced developed countries”[38] whereas low-income economies like Cambodia, conduct next to none. “What is common to most East Asian economies though, is their success in absorbing knowledge from abroad.”[39] Among lower-tier Southeast Asian economies, firms in low-income Cambodia “are among the most active in adopting and adapting activities”.[40] For the higher tier Northeast Asian economies, long-term contracts for original equipment manufacturing have been an important channel for building technological capabilities. Successful firms have achieved supplier-oriented industrial upgrading, i.e., sequential advancement from original equipment manufacturing to original design manufacturing to original brand manufacturing. Incremental innovation and user-driven innovation have been significant, especially in new personal computing products.

Consumer markets for wireless and digital devices in countries such as South Korea, for example, are growing more rapidly than are similar markets in the United States. Equally important is the fact that many consumers in these markets (including firms producing advanced electronic-systems products) demand more advanced applications than is true of consumers elsewhere in the global economy. Users play a crucial role in demanding and in some cases developing or “co-inventing” new applications in the aforementioned industries, as well as in logistics.[41]

Such developments have hastened the speed of product cycling. Hence, “firms must combine product innovation and differentiation, and the learning and acquisition of specialized capabilities that implies, with high volumes, speed-to-market, competitive pricing, and the ability to penetrate new and uncharted markets.”[42] Indeed, this has been at the core of the success of the small and medium Taiwanese firms. For instance:

With flexible production and marketing networks, Taiwanese fashion shoe companies have managed to accommodate the rapidly changing fashion trends and small orders in the world market. As competition intensified in the mid-1980s, the number of product cycles grew from two to four and, eventually, eight per year. Taiwanese fashion shoe manufacturers received orders from international buyers who, in order to minimize risks in the increasingly unpredictable fashion markets, placed smaller orders more frequently, sometimes on a monthly basis. The lead-time between order placement and product delivery was compressed from 3–4 months to 1–2 months. Southeast Asian shoe manufacturers entered the competitive shoe export markets in the 1980s. Taiwanese shoe companies distinguished themselves by shifting from OEM (Original Equipment Manufacturing) to ODM (Original Development Manufacturing) arrangements with international buyers, and took greater initiatives in product design and development.[43]

Similarly, “China’s competitiveness is derived not only from inexhaustible human resources but also from the diversity of foreign companies that interact and develop agile local players, a strength that has been hard to find in Japan.”[44]

Investment and innovation also serve to lengthen quality ladders and deepen quality specialization. The greater the degree of product
differentiation (e.g. greater the variety of cotton shirts) the longer will be the quality ladder in that market and less the likelihood that “wages in Los Angeles are set in Shanghai.”[45]

An important aspect of the innovation at various nodes in the supply chain is the scope for cross-benefits. “The lead firms recognize how their products create potential value and they negotiate over its division with their partners. A successful firm understands that the creation of value through innovation is not a zero-sum game, and profits are needed all along the supply chain to sustain innovation by all participants.”[46] Innovations may be spurred at the level of design, manufacturing or distribution. For example, “PC makers are pushed to incremental innovation by component makers (such as for semiconductors, storage, or power supply) who introduce frequent changes in their products (faster speed, greater capacity, smaller form factor, longer life) in efforts to gain greater market share within their industry sector. They also are pushed by consumers who want the latest technologies.”[47] It can be easy to overlook the fact that “the ability to exploit offshore innovative talent has supported the entry and growth of numerous U.S. firms pursuing new business models and technology strategies.”[48]

With innovation playing an expanded role at all levels of the supply chain, the value of education is considerably magnified, at all levels, and in new cross-disciplinary areas. There is need for a variety of skills, especially at interfaces, for example, “hardware engineers who can work with communications standards, and software engineers who can produce embedded software that enables customization of products for markets.”[49]

All this requires infrastructure—appropriate educational and research institutions, funding, and collaboration between research institutions and private business. The quality of communications infrastructure (e.g. broadband access) is vital. The role of public policy as facilitator is far from trivial. From regulatory environments and tax structures that encourage innovation, to financial development and macroeconomic stability, all contribute significantly to the overall business environment for innovation. Intellectual property rights management includes far-sighted patenting and licensing policies.

The international performance of firms, including multinationals, is affected by policy and other economic conditions in their home countries. And this link is especially strong for firms’ innovation-related activities, which rely on a complex infrastructure of public and private institutions devoted to knowledge creation and transmission, personnel training, and other activities.[50]

Take, for example, the small story of the beginnings of a computer programming and pharmaceuticals hub in Hyderabad, India: Soon after N. Chandrababu Naidu became chief minister of the state of Andhra Pradesh in August 1995, he ordered that a partly built and abandoned government building here on the edge of the city be finished and turned into a college for computer software engineers. Today, the building houses one of 300 institutions of higher learning in a state that graduates 65,000 engineers a year, compared with 7,500 when Mr. Naidu took office.[51]

Alertness and quality of public policy are crucial.

The Gosling Challenge: Late-entry Countries

For late entry Southeast Asian countries, like Cambodia, Laos, Myanmar, and Vietnam, catch-up industrialization in the contemporary global context of global production networks entails both new opportunities and challenges.

First, of course, there is the opportunity to join in as a small player in the extensive global value chain. Component manufacturing enables small firms to enter the global production network in specific and narrow activities of comparative advantage. It eliminates the need for managing the complete production and marketing process of an end product. Further, intra-product specialization enables less developed economies to focus on labor-intensive components of sophisticated products while benefiting from participation in a modern global supply network. The scope for knowledge transfer improves, and the goal of moving on to more skill-, capital- and technology-intensive steps of production becomes more proximate. As we saw above, the complementarity between production and process innovation can usher in a commensurate climb up the innovation ladder as well. Cambodian firms, for example, have done quiet well in adopting and adapting products, processes and methods from advanced countries.[52]

Also, once a particular node of a supply chain has been established in a country, the likelihood of local expansion of auxiliary activities improves substantially. These opportunities may be enhanced, for the Southeast Asian economies, by the simultaneous growth occurring in China and India. As the more advanced ASEAN economies, with their comparative advantage in component production and resources, participate in the production networks created between these giant neighboring economies and others, growth externalities will be created for the lowest-income countries of the region. In short, there are real opportunities for “growth leverage.”[53] In the realm of innovation too, “the emergence of East Asian national and regional knowledge stocks [...] are now providing an indigenous or regional foundation for new innovations and for cross-border knowledge flows.”[54] It is worth emphasizing that “even in poor economies, some indigenous innovation effort increases the country’s capacity to absorb knowledge from abroad.”[55]

The prospects of the late-entry countries may also be well-served by stronger regional integration. In addition to the benefits of preferential treatment, standardization, etc., such integration also allows late-entry countries to gather momentum for a strong reform constituency: Perhaps the best argument for economic integration is that it will make the fact more obvious that some countries are ahead and that some are behind. And the people of the lagging countries will start asking their governments the reason why.[56]

However, entry into a fiercely competitive international division of labor is not expected to be easy. Early entrants have pre-established relationships and markets. Further, in this scenario of trade in intermediates, product differentiation, and shortened product cycles, unlike in the
earlier flying geese paradigm, there may be no immediate forerunner to copy and no period of import-substitution for learning-by-doing while serving a protected domestic market. In production for a global supply chain, timeliness and quality are imperative. It is not easy to acquire the nimbleness required to fit into an efficient and lean international production network. In addition, growth heterogeneity within China could make for the possibility that production networks may become focused within that large nation, delaying the emergence of outward waves of structural shifts.

For the growth leverage to work, these economies must make improvements in trade-facilitating infrastructure, including institutions of contract enforcement, regulation and standards. In this complex and rapidly changing scenario, the role of the state as a major agent of catch-up industrialization will necessarily be more facilitating in nature. The importance of provision of infrastructure takes on significant proportions. A noteworthy aspect is the development of internal trading networks that can link the rural sector to the global, or at least regional, production network. Creation of a knowledge workforce is another prerequisite.

Conclusion

The international economic landscape has changed significantly since the flying geese paradigm unfolded, first in Japan, then in the Tiger Economies, and then in the ‘ASEAN Four’ (Indonesia, Malaysia, Thailand, and the Philippines.) That was a world where catch-up industrialization demanded mastery over entire product lines. In the contemporary scenario of complex webs of global supply chains, catch-up industrialization can begin with simple component manufacturing. There is more competition, but there are more opportunities too (in particular to master small phases of production), and significant spillover benefits.

However, the international division of labor, while finer, still rests on comparative advantage. This is true also of the international division of labor in innovation that has developed in conjunction with the spread of global production networks. There remains a hierarchy—akin to that of flying geese—of technology and innovation, and flowing from that, of value added capture; and competitive advantage still drives the participation process. But instead of comparative advantage residing in complete end-products, it is found typically in separate phases of production; design, engineering and marketing are most often the realm of the more developed economies whereas the edge in the manufacturing and in the assembly of components belongs to the less developed.

For today’s less developed economies the key to catch-up industrialization is to become a part of the rich matrix of global supply chains, and to steadily climb the technology ladder. For the Asian developing economies in particular, the emergence of China and India offers opportunities for participation in rapidly expanding regional supply chains. In addition to this growth leverage, there are membership externalities—from interaction with the more advanced members of the modern, global supply chain—of learning new and better ways of design, production, and management.

At the same time, these changes also mean a faster moving ‘air stream’, if you will, and more crowded skies. With the global spread of technological ability, innovation-related activity and dynamic markets, shifts in comparative advantage have become more rapid, and affect a wider range of products. Product differentiation has multiplied and product cycles have shortened. ‘Flying’ requires greater agility, on the part of all. Firm-level efficiency, nimbleness, and creativity are crucial both to entering the supply chain and moving up the value chain.

Challenges notwithstanding, in the contemporary global context not only does the process of sequential shifting of competitive advantage remain the premise of catch-up industrialization, as when the flying geese roamed the newly industrializing Asian economies, but also the noteworthy factors contributing to participation and upgrading in the technological ladder are ever more significant. The value of innovation is widespread, spanning all nodes of the supply chain, from process to design, from manufacturing to distribution, and communications. Incremental innovation and user-driven innovation are contributing dynamism to industries. The scope for cross-benefits is extensive. The role of education is crucial – at all levels, in a variety of fields and in new cross-disciplinary directions. The significance of facilitating public policy cannot be overstated, in particular, infrastructure provision for education and innovation, and creating environments conducive to innovation. Quality and alertness of policy are the order of the day.

Looking at East Asia in particular, despite the transformed context of production activity, the regional hierarchy of value added remains pretty much unchanged, with Japan and the East Asian Tigers in the lead. Catch-up industrialization is ongoing, with its new opportunities and challenges. Sequential shifts in comparative advantage continue to drive the process, and in that sense, yes, the geese continue to fly!

ENDNOTES

1. Writing in Japanese. [Return to Text]
2. This paper is not a discussion of the theoretical and empirical issues surrounding the flying geese model of development. Rather than the details of the pattern, I focus here on the process of sequential shifting of comparative advantage as a basis for progression on a scale of technological ability and catch-up industrialization. [Return to Text]
3. Akamatsu (1962) p. 11 [Return to Text]
4. Ibid, p. 12 [Return to Text]
5. Vernon, 1966. The product cycle theory captures the process of invention of a product (in an advance economy), its production and export, standardization of its production technology, adoption and production by developing countries based on lower costs, culminating in the original country importing the product. [Return to Text]
6. Kojima (1977) p. 150 [Return to Text]
7. Ibid p. 151 [Return to Text]
9. Bardhan (1990) p. 6 [Return to Text]
10. Gerschenkron’s (1962) [Return to Text]
13. Gill et al. (2007a) p. 9
15. Ibid, p.38
16. Ibid, p.39
17. Koopman et al. (2008) p.18
19. Linden et al. (2007) p. 10
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