Where China is headed

Transportation and physical distribution problems

IEDA Hitoshi

Fellow

Professor, School of Engineering, The University of Tokyo

MA Liqiang

Doctoral Course, Graduate School of Engineering, The University of Tokyo

Economic growth, transportation and land of China

– A contrast with Japan's rapid economic growth –

How did China achieve rapid economic growth?

The Chinese economy has grown at a tremendous annual rate of 9-16% since about 1980 and per capita GDP has increased by a factor of 19 over the last two decades. This remarkable growth rate surpasses that of Japan during its period of high growth (with an annual rate of 10% between about 1955 and 1970), when it was known as the wonder of the East.

A country's rapid economic growth is in many cases closely related to improving trade. In the case of China, exports and imports have increased by a factor of 20 (at an annual rate of 15.7%) and 19 (at an annual rate of 16.7%), respectively, indicating that trade has made a significant contribution to rapid growth.[1)] Combined with the policy of operating special economic zones, this trade-driven growth has been boosted since about 1990 by the development of export production bases, mainly in coastal areas, by foreign companies seeking cheap labor. This began with parts manufacturing and has advanced to assembly and production factories.

As the population's spending power increased in areas experiencing remarkable economic growth, such as these coastal areas, industrial development aimed at satisfying the growing domestic consumer market as well as exports to third countries began in the late 1990s. In addition, China joined the WTO in 2001. In the years ahead, "mature" economic development, including the modernization of non-physical systems, such as the internationalization of legal systems for customs clearance, and the sound development of carrier businesses such as freight forwarders is strongly expected.

Economic growth and transportation services

It is clear that economic progress is closely related to the state of transportation services. However, the conditions in China are completely different from those in the high-growth period in Japan.

An examination of domestic freight growth, in ton-kilometers, in China over the last two decades reveals that it grew at just 0.26 times the GDP growth, although actual ton-kilometers have significantly increased. In contrast, domestic freight in Japan during the high-growth period (for two decades between 1960 and 1980) was at a level 0.52 times GDP growth.[2)] That is, Chinese freight growth was one-half that of Japan. Japan's export-driven economic growth was achieved mainly in the Pacific coastal

[1)] Japan is China's largest trading partner . (Exports to and imports from China accounted for 14% and 18% of Japan's total exports and imports, respectively, in fiscal year 2003.) Large violent anti-Japan demonstrations in various parts of the country were a shock to many Japanese.

[2)] The growth of domestic passenger-kilometers in the high-growth period in Japan was 0.55 times GDP growth, whereas in China it remains at 0.37 times GDP growth. Incidentally, the growth of domestic freight ton-kilometers and domestic passenger-kilometers in Japan over the last two decades were 0.74 times and 0.83 times GDP growth, respectively.

industrial belt. China's export-driven economic development is also attained in the coastal areas, but the economic flow has not correspondingly penetrated the entire nation to date. Reflecting this export-driven economic development, the facilities at large international container ports, such as Wai Gao Qiao in Shanghai and Yantian in Shenzhen, have improved. Ocean freight volume and the number of calls by large international trade vessels have increased explosively. (Figure 1)

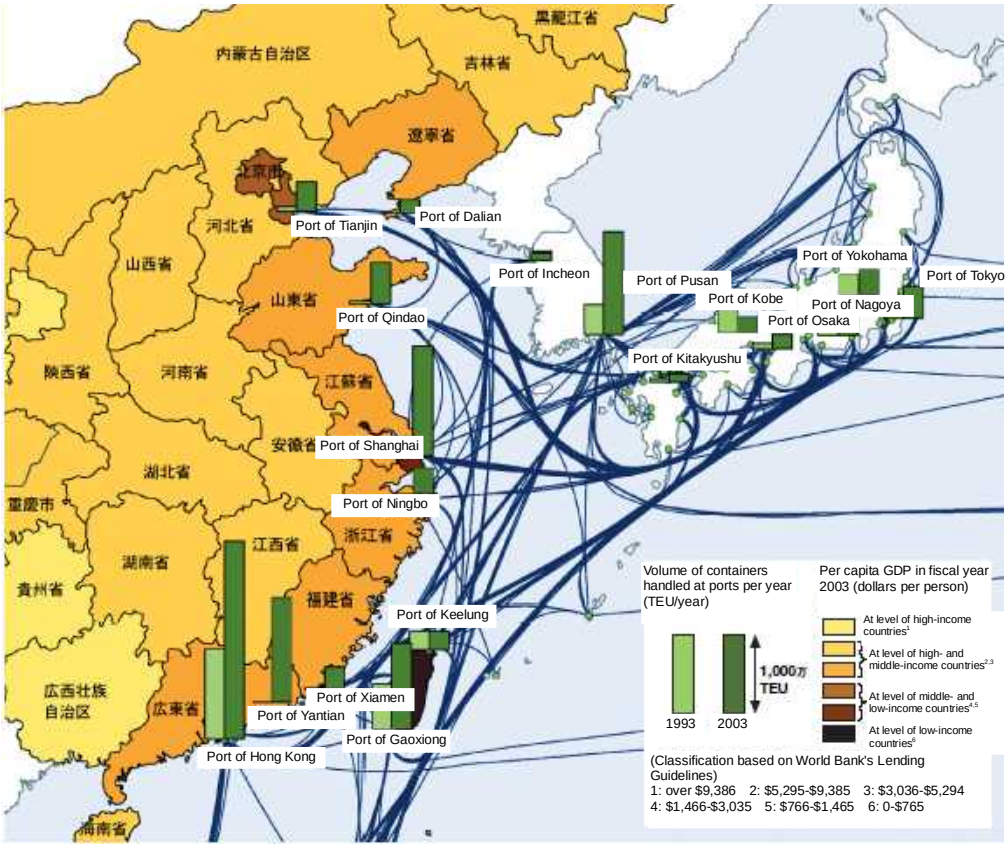

Figure 1 Regional differentials and international container ports in China

As noted above, the expanding domestic consumer market is expected to be of increasing importance in the future economic development of China. Bottlenecks in economic development are the limited supply of energy and limited capacity in the domestic transportation infrastructure.[3] To relieve the bottlenecks, transportation infrastructure is being upgraded at a breakneck speed unprecedented in mankind's history.[4] More specifically, this upgrading includes the construction of highways[5] and airports, railway electrification to expand freight transportation capacity and the speeding up of existing railways .[6]

What are the bottlenecks in economic development?

If asked to cite just one important feature of postwar economic growth in Japan, the author would answer without question that it was the leveling out of income differentials among regions. The Gini coefficient[7] of per capita GDP by prefecture in Japan fell from 1/2 to 1/3 and the income differential was significantly reduced in the 40-year postwar period. This falling income differential, noteworthy on a global scale, was attained not only by

[3] The relationship between domestic transportation infrastructural improvement and domestic market expansion is a chicken-or-egg problem.
[4] Japan's Official Development Assistance (ODA) contributes to the upgrading of transportation infrastructure to no small extent.
[5] New highways have recently been constructed at a pace of 2,000 km a year, so China outpaced in an instant the total length of highways in Japan.
[6] Of total domestic freight ton-kilometers, marine/water, rail and road transportation modes account for 55%, 30% and 15%, respectively. The proportion of marine/water transportation is increasing slightly. As the scale of the domestic market increases, the demand for medium- and short-range transportation will grow and the proportion of road transportation will rapidly increase. Of domestic passenger-kilometers, road, rail and air transportation account for 55%, 35% and 10%, respectively and the proportion of road transportation is tending to increase slightly.
[7] The Gini coefficient is a measure of the equality of income distribution. A value of zero represents complete equality and a value of one represents complete inequality. According to 2002 statistics, the Gini coefficient of household income in Japan was 0.498 and is tending to increase at the moment.

mechanizing agriculture and adding value to agricultural products but also by absorbing redundant labor in the provinces in urban tertiary industry, which grew as the consumer market expanded. It is clear that industrial policies, such as the promotion of new industrial cities, and public works policies aiming at steady development of various areas of infrastructure contributed to the process of reducing income differentials.

In contrast, the income differential among regions in China remains too large (see Figure 1) and it might even be said that the differential is tending to widen. Correction of these regional differentials is the greatest hurdle to be crossed on the way to the next stage of not only economic development but also political stability. A key to solving the problem is the upgrading of the interregional transportation infrastructure. However, the upgrading of passenger and freight transportation functions over China's vast land area will put considerable demands on the effort to improve the infrastructure.[8)]

The absorption of surplus labor in urban areas is also problematic. China's major cities are really enormous in scale. In Japan, the total population of cities of more than one million, from Tokyo (with 8 million residents) down, accounts for about 25% of the entire population. In China, the population of the big cities accounting for 25% of the entire population is 3 million or more. Surprisingly, the number of mega cities exceeding 3 million in population totals 13.[9)] During the period when the economies of Japan and the NIES took off, the presence and growth of major cities were prominent as compared with development in the Western countries. However, the problems facing mega cities in China may be more serious than those that Japan and the NIES experienced. The differential between rich and poor will merely move from rural to urban areas unless measures to ease congestion, ensure safety and fight poverty bear fruit.

As noted above, it is not only trade and international transportation that are closely related to China's economic growth; the economy and people's lives in Japan are also affected. Both China's moves and the economic and political moves of Japan relating to China have a sensitive effect. It is safe to say that the people of Japan should keep a close eye on China.

[8)] There are various views as to the requirements for upgrading interregional transportation infrastructure. Ieda hypothesized that the requirement was proportional to population$^{1/2}$ times area$^{1/2}$ to population$^{1/4}$ times area$^{3/4}$. (Roads, April 2005 Issue) Assuming that this hypothesis is correct, with China's population 10 times that of Japan and its area 26 times that of Japan, an interregional transportation infrastructure of a scale 16-20 times larger than that of Japan will be necessary.

[9)] The top five cities ranked by population are Shanghai (13 million), Beijing (11 million), Chongqing（10 million), Wuhan (7 million) and Tianjin (7 million).