

Lessons from China for Africa

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Abstract

China has been the most successful developing country in this modern era of globalization. Since initiating economic reform after 1978, its economy has expanded at a steady rate over 8 percent per capita, fueling historically unprecedented poverty reduction (the poverty rate declined from over 60 percent to 7 percent in 2007). Other developing countries struggling to grow and reduce poverty are naturally interested in what has been the source of this impressive growth and what, if any, lessons they can take from China. This paper focuses on four features of modern China that have changed significantly between the pre-reform period and today. The Chinese themselves call their reform program *Gai Ge Kai Feng*, “change the system, open the door.” “Change the system” means altering incentives and ownership, that

is, shifting the economy from near total state ownership to one in which private enterprise is dominant. “Open the door” means exactly what it says, liberalizing trade and direct investment. A third lesson is the development of high-quality infrastructure: China’s good roads, reliable power, world-class ports, and excellent cell phone coverage throughout the country are apparent to any visitor. What is less well known is that most of this infrastructure has been developed through a policy of “cost recovery” that prices infrastructure services at levels sufficient to finance the capital cost as well as operations and maintenance. A fourth important lesson is China’s careful attention to agriculture and rural development, complemented by rural-urban migration.

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1. Introduction

China has been the most successful developing country in this modern era of globalization. It was one of the poorest countries in the world in 1980. Since initiating economic reform after 1978 its economy has expanded at a steady rate over 8% per capita, leading to a dramatic improvement in living standards (Figure 1). This growth has fueled historically unprecedented poverty reduction: the share of the population living beneath the World Bank's "cost of basic needs" poverty line declined from over 60% at the beginning of economic reform in 1978 to 7% in 2007.¹ Other developing countries struggling to grow and reduce poverty are naturally interested in what has been the source of this impressive growth and what, if any, lessons other developing countries can take from China.

There are many different factors that have led to China's success. Some of these are deep-seated features of Chinese culture. For example, the Confucian ethic put a strong emphasis on education. Already in 1870 21% of the adult population in China was literate, far ahead of other parts of the developing world such as Latin America (15%) or South Asia (3%) (Morrisson and Murin 2005). Confucian societies also tend to have very high savings rates. However, these long-standing features of Chinese society cannot by themselves explain recent economic performance. Between 1870 and 1978 the Chinese economy did not perform particularly well, despite the fact that those long-standing characteristics were in place. In this paper I am going to focus on a number of features of modern China that have changed significantly between the pre-reform period and today. These changes provide interesting lessons for other developing countries.

¹ The "cost of basic needs" approach determines the amount of consumption that a person needs in order to have 2100 calories per day plus the other basic necessities of life.

China's experience shows that these things can be changed relatively quickly. Of course countries should not blindly copy China or any other model: the measures adopted in China would not have exactly the same effect if adopted somewhere else. But I think that countries can learn from each other and bring these lessons to bear on solving their own unique development challenges.

A good place to start is with how the Chinese themselves describe their reform program: *Gai Ge Kai Feng*. This translates roughly as "change the system, open the door." "Change the system" means altering incentives and ownership, that is, shifting the economy from near total state ownership to one in which private enterprise is dominant. The next section describes how China created a good investment climate for private entrepreneurship and how private investment has become the driving force of the economy. An interesting feature of China that led to this result is a high degree of local autonomy that resulted in competition among literally hundreds of cities to create a good investment climate and attract investment.

"Open the door" means exactly what it says. Before 1978 China had one of the most closed economies in the world. It unilaterally liberalized trade and has become one of the most open developing countries. Concerning foreign investment, China welcomed direct investment that brought technology, management skills, and global production networks, and managed the regime for direct investment in order to get the most capacity building for Chinese workers and firms. Up to now, the economy remains quite closed to portfolio investment. This pattern is the exact opposite of that followed by many developing countries in the 1970s and 1980s when countries borrowed internationally but were relatively hostile to direct investment. The open door policy has led to China

becoming the largest destination of direct foreign investment and to its emergence as a manufacturing and trading superpower.

Visitors to Chinese cities are always struck by the quality of Chinese infrastructure: good roads, reliable power, world-class ports, and excellent cell phone coverage throughout the country. What is less well known is that most of this infrastructure has been developed through a policy of “cost recovery” that prices infrastructure services at levels sufficient to finance the capital cost as well as operations and maintenance. China has been able to rapidly expand its infrastructure network by borrowing at commercial interest rates and servicing the resulting debt through appropriate prices for power, roads, rail, and telecom.

A fourth important lesson is the role of agricultural and rural development, complemented by rural-urban migration. China is a densely populated, resource-scarce country that started reform with 80% of its population rural. Grain output per hectare was already pretty high. So, raising incomes for the large rural population required a number of complementary measures. First, the shift to private entrepreneurship started in the agricultural sector, well before it came to cities. The “household responsibility system” was the initial step in a process of continually strengthening land tenure rights for farmers. Second, agricultural markets were liberalized, culminating in China’s commitment to a very liberal agricultural trade regime when it joined the WTO. These first two measures were complemented by strong efforts in agricultural research and extension. The result was some modest further improvement in grain productivity, plus very dramatic increases in diversification and earnings from products such as fruit, tea, meat, and milk. These successes enabled China to *take some land out of agricultural*

production and return it to ecological uses, helping the long-term sustainability of agriculture. China is one of the few countries that has increased its forest cover, from 12% to 18%.

Even with these advances in agriculture, however, the productivity gap between urban and rural employment has remained large. Hence, migration from low-productivity rural employment to higher productivity urban employment is an important source of growth. China has a registration system that controls and to some extent limits migration. Still, the system has been flexible enough to allow more than 200 million people to relocate from rural to urban locations. This migration has involved very substantial relocation from interior locations to coastal ones.

While the main theme of this paper is that there are positive lessons that other developing countries can draw from China, it is also the case that there are some negative consequences of rapid growth that have not been dealt with as well in China as they could have been. Such rapid growth would inevitably put stress on the natural environment, but lax enforcement of environmental regulations resulted in more pollution than was necessary. Despite some progress with cleanup efforts, pollution levels in China continue to be too high in the sense that the health costs of pollution are greater than the cost of cleanup. **Section 6 <okay?>** reviews some of these environmental issues and draws some lessons from China's negative experience, that is, mistakes that other countries will want to avoid

2. “Change the system”

Before economic reform China had a planned system based on collectivized agriculture and state ownership of the means of production. In 1978 3% of retail goods were traded at market prices, and 6% of farm commodities. State-owned enterprises accounted for 77% of industrial production, and the rest came from collectives that were basically local state enterprises (Table 1). China has gradually reformed ownership over the past 25 years, starting with agricultural reforms detailed in a later section.² In the first decade of reform it opened up some locations to private foreign investment, allowed more scope to township and village enterprises to operate on a market basis, and introduced various reforms in state firms. These reforms accelerated after a famous trip by Deng Xiaoping to the dynamic southern coastal areas in 1992. By 1995 China’s industrial output was divided roughly evenly among state enterprises, collectives and private firms.

Since 1995 the private sector has expanded very rapidly and by 2003 accounted for 72% of industrial output. In this period many collectives and state firms were privatized, and entry of new private firms was encouraged. In 2005 the statistical bureau and the World Bank carried out a large survey of 12,400 manufacturing firms in 120 cities (World Bank 2006). The firms in the stratified random sample had in the aggregate more than 10 million employees, so that this is roughly a 10% sample of manufacturing. In this sample only 8% of firms are majority state-owned; 27% are foreign-invested; the large majority of firms are domestically owned private firms (Table 2). The Chinese economy is now largely based on the Chinese private sector. The sample also found that

² Early stages of China’s reform are described in Lin (1988) and Lin (1992). See Rawski (1994) on the industrial reforms in the 1990s.

the pre-tax rate of return for domestic private firms was quite high, around 20%, similar to the high rate of return in foreign-invested firms. State firms, on the other hand, had about one-third that rate of return. Employment growth for the private firms has been nearly 10% per year in recent years; employment in state firms has been contracting at 3% per year.

How has China come to have such a vibrant private sector? One factor certainly is the very good investment climate that one finds in many Chinese cities, especially coastal ones. In general, the burden of bureaucracy and regulation is low compared to other developing countries, and the quality of infrastructure very good. This can be seen in some of the indicators from World Bank investment climate surveys carried out in different countries. For example, Chinese firms report that it takes an average of 7 days to get a mainline telephone connection, compared to 34 days in African countries (Table 3). Chinese firms lose about 1% of output to power outages, compared to an average of 4% in African surveys, and much higher numbers in some countries (Kenya, 8%; Tanzania, Uganda, 10%). On the regulatory side, many features of doing business are relatively easy in China: for example, it takes 32 days to register a property, compared to 110 days on average in Africa.

Why have Chinese cities done so well creating a good climate for private investment? Probably one reason is that a key aspect of reform has been to decentralize decision making to provinces and cities. Chinese cities have then competed actively with each other to attract first foreign investment, and more recently, domestic private investment. Among Chinese cities there are significant differences in investment climate, firm profitability, and growth rate of the private sector. Cities that have 50% higher rate

of profit see a higher growth rate of the number of private firms by 10 percentage points (Figure 2). Capital and labor tend to gravitate toward the more successful locations, which directly pulls up the overall growth rate. There is likely to be an indirect effect as well as lagging cities feel the pressure to reform and improve. The growth of certain cities is extraordinary: Dongguan in Guangdong province was a town of 300,000 people at the beginning of reform. It has grown into a major industrial city of several million people. Many of the most successful Chinese cities are second-tier cities whose names are not well-known worldwide: Dongguan, Foshan, and Shenzhen in Guangdong; Xiamen in Fujian; Hangzhou and Wenzhou in Zhejiang; Suzhou in Jiangsu; and Qingdao, Linyi, and Yantai in Shandong, to name some good examples.

3. “Open the door”

Prior to 1978 China was one of the most closed economies in the world. Foreign trade was completely monopolized by one government ministry, and there was in practice very little trade with the outside world. A key component of the reforms launched in 1978 was to “open the door” to foreign trade and investment.³ Most of the controls pre-1978 were administrative, and since then they have gradually been dismantled. First, a limited number of trading companies were allowed to engage in international trade; by the mid-1980s this had increased to 8,000. More and more manufacturing firms were given the right to import and export directly. By 1990 China’s economy was far more open than those of the other low-wage countries in Asia.

³ Eckhaus (1997) and Lardy (2002) analyze the importance of liberalizing foreign trade and investment for China’s modern development.

At the same time the economy was gradually opened to direct foreign investment, but not to portfolio flows. Initially, foreign investors were directed to a number of special economic zones. But after the mid-1990s most of the country was open to direct investment. “Special zones” have mostly been important in China as locations that drew concentrated infrastructure investment by local government. The period during which special zones were favored with different tax or regulatory policies was relatively brief. Of the successful cities mentioned in the section above, only Shenzhen and Xiamen were ever special economic zones. Most of the successful industrial locations in China were not favored with special national policies; rather they benefited from the effort of competent local authorities to develop infrastructure and relatively easy regulatory frameworks.

It should be stressed, however, that China adopted a number of measures that were aimed at maximizing the capacity building for Chinese workers and firms that came from the direct investment. China was concerned that foreign enterprises would be enclaves with little spillover benefit to the rest of the economy. So, the country has always had strict limits on the number of workers that foreign investors could bring into the country. Foreign investors were pushed to the maximum to hire Chinese staff and train them. Initially, foreign investors had to partner with a Chinese state enterprise, often in 50-50 joint ventures that left control unclear. This policy was debatable, as it limited the kind of investment that China would get. It was only after 100% foreign subsidiaries were allowed in the 1990s that foreign investment in more technology-intensive industries started to come to China. In the auto industry foreign producers had to meet strict domestic content requirements (no longer allowed now that China is in the

WTO). One can debate the utility of specific measures, but in general China had quite an activist regime aimed at ensuring that foreign investors employed skilled local labor and developed ties outside of their “enclave.” There are interesting lessons here for other developing countries to study.

The results of China’s opening to trade and investment are well known. Between 1990 and 2006 China’s imports increased at an annual rate of 16%. China has been a major source of new demand for many developing countries in Asia, Latin America, and Africa. The country’s exports also increased at 16% per year over this period. Annual inflows of direct investment have grown steadily, reaching a level of nearly \$80 billion in 2005, making China the number one destination of overseas investors. Relative to GDP, however, China’s investment inflows are not that unusual in Asia: Malaysia, Thailand, Vietnam, and Mongolia have comparable levels.

Since 1990, at each stage of its development China has kept its trade regime more open than other developing countries at the same level of per capita GDP. In 1990 China’s average import tariff was 40%, well below those of Bangladesh (94%), India (82%), or Pakistan (65%). Thailand (40%) had the same average tariff rate in 1990. Since then China has steadily reduced import tariff rates. Actual tariff collection in 2006 was only 2% of import value. There has been a general trend in developing countries to reduce protection against imports. Still, in 2006 tariff collection in Africa was far higher than in China: an average of 13% for all of Sub-Saharan Africa and higher rates in some countries (e.g., Ethiopia, 18.5%) (Table 3).

China’s openness to the global economy goes well beyond import tariffs. The country has also developed very efficient customs administration and ports. One

question in the World Bank investment climate survey of firms is for manufacturing firms that import parts or materials, which is very common worldwide: What was your longest customs delay in the past six months? The average response in Chinese surveys is 12 days, compared to twice as long in African surveys. Ports in China also tend to be very efficient. The cost of exporting a container of goods to the U.S. is quite low, \$335. It costs almost five times as much (\$1561) to send a container from the typical African country.

The combination of low tariffs, efficient customs, and efficient ports means that large numbers of firms in China are very well connected to the international market, and that has proved to be one of the key advantages spurring the rapid development of these firms. For many African countries, the formal trade regime is as open as China's. However, problems in customs and ports mean that the actual connection of African firms to the global market is weaker.

4. Infrastructure finance and pricing

Everyone who comes to China is impressed with the infrastructure. It is not surprising that the flagship cities of Beijing and Shanghai have good infrastructure. What is more remarkable is that large numbers of cities one has never heard of have similarly good transport infrastructure and reliable power supply. The rapid expansion of infrastructure has been an important factor sustaining China's growth. Between 1998 and 2006 capacity of the power sector grew at 10% per year, keeping pace with the needs of the economy. The rail network, the most extensive in the world, increased its line length by more than 10,000 km. Most rapid has been the expansion of the expressway system

nationwide, which grew in length at a rate of 21% per year over the period, reaching a total of 45,339 km by the end of 2006.

How has China financed this expansion of infrastructure? In every sector the government played an important initial role, providing some budget capital. But in recent years there is very little additional investment from the budget in these infrastructure sectors. Rather, the key to China's success has been a policy of nearly full cost recovery. In general, infrastructure services are priced to cover the cost of the capital as well as the cost of operations and maintenance.

In the power sector, for example, China set its reform course with the 1985 State Council Decree, "Diversify the Sources of Financing for the Power Sector and Implement Debt-Repayment Electricity Price for New Power Plants." This decree put an end to the Central Government as sole source of financing for power sector investment and allowed local government as well as public and private, foreign and domestic investors to participate in power project financing. Most important, the decree allowed electricity price to be set high enough to recover equity investment, serve all the debts, and make a reasonable profit. As a result, generation capacity increased from 67 GW in 1981 to 622 GW in 2006, an average annual growth rate of 9.8%. The first BOT power plant by foreign investors, in any developing country, was completed in China in 1987. The result of this cost recovery policy is that China has relatively expensive power for industrial use, but a power network that is extensive and reliable. In 2005 the U.S. dollar price per kilowatt hour was higher in China than in the U.S., France, Brazil, or Russia (Figure 3). Germany and the U.K. had modestly higher prices; only Japan had a substantially higher

power price than China.⁴ China's experience is that industrial firms are willing to pay these prices in order to have reliable supply. The result is that power generation is a profitable line of business, one that can easily borrow to finance new capacity and service the loans from revenue.⁵

In transport, most roads are toll roads, so that China has more tolled kilometers of roads than any other country in the world. The toll per kilometer in China is comparable to toll rates in the U.S. or Italy (Figure 4). China's rate is lower than in countries such as France or Japan, but China's cost of constructing a kilometer of expressway is also lower because labor costs are so low while the real productivity of Chinese construction firms is high. Relative to per capita income, Chinese tolls are the highest in the world (Figure 5). It takes more than 2% of average per capita income to cover the tolls for a 1,200 kilometer trip. In most of the developed world it would take less than one-half a percent. Pricing policy for expressways in China is somewhat controversial since tolls are so high relative to per capita income. But the Chinese adherence to this pricing policy has resulted in the expansion of expressways on an economic basis. Most stretches of the system easily pay for themselves. There are examples where China has taken a completed toll road and sold it on the stock market so that ordinary investors can benefit from this sound investment.

The result of the cost recovery policy is that it does not take ongoing large infusions from the budget to keep the infrastructure program expanding. In 2006, there

⁴ The price shown for China is the regulated price for industrial users set by the central governments. Some local governments have offered discounted power tariffs to foreign investors in special industrial zones, but the practice is now discouraged by the central government.

⁵ An issue for the future is that China modestly subsidizes the price of power for households. Since the residential sector only consumes 10% of China's power, it is not financially difficult for power companies to cover this subsidy through the higher prices for industry. However, as household power use rises toward the 30-40% of total consumption common in OECD countries, subsidization will not be financially sustainable.

was US\$80 billion of new investment in the expressway sector. More than 40% was financed by tolls and fees collected on existing roads. An additional 40% was financed by loans, which will be serviced by tolls collected on the new roads. Direct foreign investment (also based on tolls) contributed an additional 10%. Finally, there were capital grants from the state budget filling the last 10% (World Bank 2007a).

The impressive expansion of the railways has been similarly financed by the internal revenue of the system. Official tariff rates for cargo are relatively low, but for years now an additional surcharge has been added to finance the expansion of the system. Thus, over the period 2000 to 2006 there was US\$95 billion investment in China's railroads. Of this about 60% came from the railway's income. Thirty percent came from loans, and ten percent from provincial governments.

China here provides some useful lessons to other developing countries. It may take some initial grants, from donors or the budget, to get the system expansion started. But if the resulting services are then priced economically, it will be possible for the power, road, rail, and other infrastructure systems (eg, telecom) to expand based on cost recovery. If infrastructure services are priced too low, then it will be impossible to expand the system in a sustainable manner. China's experience shows that even in a low-income country firms can be highly competitive while still paying full cost for infrastructure services.

Another lesson from China is that the government has been pragmatic about ownership. State firms play an important role in power generation, rail, and water. But the government has also permitted foreign investment in all these sectors, and at times has privatized infrastructure assets in order to get revenue to expand the system.

5. Agricultural development and rural-urban migration

At the beginning of reform China was a largely rural country with 80% of the labor force employed in agriculture. It should not be a surprise that the reforms really began in the rural sector. The “household responsibility” system broke up the collective farms and returned most farming to a family basis. Land was divided fairly evenly among households. The initial use-right was quite limited; a family could not sell or mortgage the right. But starting in 1978 China has continuously strengthened land tenure, and confidence in land property rights can be seen in the investment that households have made to increase the productivity of the land. The household responsibility system immediately led to a 20% increase in grain production.

China has also gradually liberalized agricultural markets giving peasants more freedom to choose what to produce and to sell on open markets. China’s WTO agreement committed the country to a very liberal agricultural regime. China’s market moves in agriculture were supported by strong state investment in research and extension. The result of the whole package has been that grain production increased modestly (11% between 1991 and 2005), while farmers increasingly shifted into high-value, labor-intensive products such as tea (up 73% over the same period) or fruit (up 741%). Overall, real agricultural output has risen at the very healthy rate of 6.3% per year between 1991 and 2005.

An area where China showed unusual foresight concerns its policies of taking land out of grain production, which is extremely water-intensive and not suitable for much of the Northern part of the country. Some of the land has shifted to cash crops; but

some has returned to “ecological use.” China is one of the few countries in which forest coverage has increased significantly, from a low of 12% to 18% today. The return of land to ecological use was pioneered in a series of World Bank-supported projects in the Loess Plateau region that have had a remarkable effect of re-greening a vast part of the Northwest. Finding a balance between use of land for agriculture and for ecological use – this is an important lesson that China can bring to other developing countries, where often there is extreme pressure to keep increasing the amount of cultivated land.

While the growth of agricultural output in China is impressive, it lags far behind the growth of industry, which has consistently been above 10%, and more like 16% in recent years. China is a resource-scarce country whose comparative advantage lies in urban industrial and service activities more than agriculture. At the beginning of reform urban labor productivity was already well ahead of rural labor productivity. As China opened to the outside world and shifted ownership to the private sector, this productivity gap increased further (Figure 6). Unskilled urban employees earn far more than the typical peasant, so that the individual incentives to migrate are strong. The real output of a worker is much higher in industry and services than in agriculture, so that it is a gain for overall GDP as labor shifts from agriculture to urban employment.

Pre-reform China had a household registration system that completely restricted people’s mobility, which has been gradually reformed over the past 25 years. Each person has a registration (*hukou*) in either a rural area or an urban area, and cannot change the *hukou* without the permission of the receiving jurisdiction. In practice cities usually give registration to skilled people who have offers of employment, but have generally been reluctant to provide permanent registration to migrants from the

countryside. Migrants who work in factories or perform manual labor in construction or household work can get status as legal migrants, entitling them to some public services, but they are not entitled to the full range of social benefits available to permanent residents. This migrant population is referred to in Chinese as “floating population,” since the initial thinking was that such migrants would stay temporarily in cities and then return to the countryside. In practice, however, a growing number of migrants are permanently relocating to cities.

China’s *hukou* system has had some effect on the pace of this migration, but has not prevented migration from occurring on a large scale. According to *hukou* registrations, China’s rural population has continued to increase, reaching over 900 million by 2004. Data based on where people actually live and work, however, show a rural population 200 million smaller (Figure 7). Data on the labor force by sector show a similar trend: agriculture’s share of the labor force has declined from 80% at the beginning of reform to 60% today. Industry and services have each expanded from about 10% of the labor force to 20%. This migration has nicely complemented what China has done to develop agriculture. The reforms spurred agricultural production, while the out-migration means that the income is spread over a smaller population.

Some of this rural-urban migration occurs within provinces. But there has also been a clear tendency for population to shift from interior China to coastal locations. According to official data, in 2005 coastal Guangdong province had 75 million permanent residents plus 16 million legal migrants from other provinces. Since all of those migrants are working, they make up about one-third of the labor force. Given that Guangdong has a good location and has built up excellent infrastructure, this migration

enables China to get the most economic benefit out of its investments. The migration also takes some of the population pressure off interior locations. Remittances from urban migrants back to family members remaining in the countryside are an important source of rural income.

It should be noted that the *hukou* system is somewhat controversial since it leads to two types of citizens in cities. Until recently rural migrants could not easily bring their families to the city and enroll their children in school. Recently a Ministry of Finance circular has clarified that cities in fact are responsible for providing public services for migrants and their families, though actual change on the ground takes some time. In defense of the *hukou* system, it should be noted that China's urbanization so far has been a relatively orderly process. One does not see in China the kinds of slums and extreme poverty that exist in cities throughout Asia, Latin America, and Africa. Nevertheless, urbanization goes on: the urban share of China's population has risen from 20% to 40% during the course of economic reform. It is very likely that another 200 million people will move to cities in the next 15 years, continuing to fuel China's growth and poverty reduction.

The role of migration from the interior to the coast can be illustrated through a comparison of the recent performance of Chongqing, an interior province of 30 million people, and Uganda, a landlocked country of similar size. Uganda has been relatively successful, and between 2000 and 2005 its economy grew at a rate of 5.5% per year. Chongqing grew faster, at 10.3%. But the biggest difference between the two locations concerns population. Uganda's population has been expanding at 3.4% per year, so that its GDP growth leads to an increase in per capita income of only 2.1% per year.

Chongqing, on the other hand, has been experiencing population decline because of out-migration, at a rate of 1.2% per year. The migrants send remittances back that stimulate the local economy, and their departure takes pressure off the labor supply, making it easier to employ the remaining population at an ever-improving wage. Thus, while Chongqing's overall growth rate is twice Uganda's, its *per capita* GDP growth rate is six times higher.

Chongqing and Uganda illustrate a more general point. In China, population growth rate is relatively high near the coast, and declines to close to zero or even negative rates as one moves inland (Figure 8). In Africa, in contrast, population growth rates are about the same in interior countries (averaging 2.3% per year) as in coastal ones (2.4%), reflecting the relatively small amount of migration going on within the continent (Figure 9).

6. Limiting environmental damage

While China provides some interesting positive lessons for other developing countries, of course it is not the case that every aspect of Chinese policy has worked out well. Hence, China also provides some negative lessons. In general, there has been more increase in inequality and social disparities during reform than was necessary. Water pollution has developed into a major problem. Probably most serious of all the problems is the situation with air pollution. Early in the reform period China developed some of the most air-polluted cities in the world. The use of coal for power, industry, and homes combined with the rapid growth of the economy created very serious air problems. By 1982 total suspended particulates averaged about 1,000 micrograms per cubic meter in

northern cities, and about 500 in southern cities. These amounts are far above the country's own air-pollution standard of 100.

Since the mid-1980s there has been marked improvement in air quality, cutting the level of air pollution roughly in half. Progress was achieved by moving industry out of inner cities and shifting home heating from coal to gas. The average city in the south now meets the annual average standard. There has been progress in the north as well, though pollution levels there remain far higher. Even with this progress, however, air pollution levels in China are well above those in other locations in the developing world (Figure 10). China has 20 of the 30 most air-polluted cities in the world. While the use of coal in inner cities has declined, motor vehicle use has been growing rapidly, creating a new source of air pollution.

A recent study by the State Environmental Protection Agency and the World Bank for the first time used Chinese epidemiological data to estimate the excess mortality and morbidity caused by air pollution (World Bank 2007b). The same study also carried out an innovative "willingness to pay" survey of residents in Chongqing and Shanghai to assess how much people valued the benefits of reducing air pollution. This study estimated that the health costs of air pollution amount to 3.8% of GDP. Many of the measures to control air pollution, on the other hand, are relatively inexpensive. Key measures are to get the worst polluting vehicles off the road, shift bus and taxi fleets to natural gas, and invest in public transport rather than individual car use.

An area where China could learn from Africa is the pricing of gasoline. Despite being the second largest importer of petroleum after the U.S., China maintains a controlled and relatively low price for gasoline. During 2000-2004 China's diesel price

averaged 40 U.S. cents per liter, about the half the level in Sub-Saharan Africa. Relatively poor countries such as Kenya, Tanzania, and Uganda all charge higher gasoline prices than China. Given that China is at an early stage of urbanization and motorization, the country faces some fundamental decisions as to whether it wants to encourage a car-based society like the U.S. or one with more energy efficiency and sound public transport, as is found in Europe and Japan.

This point about the low price of gasoline may seem to contradict the point about pricing of infrastructure, but it is actually a distinct point. China is a highly resource scarce country, yet it chooses to price some key natural resources at low rates that do not reflect scarcity or negative externalities. This is true not only for gasoline, but also for water use by households, which is priced on average at 75% of cost recovery. So, household use of water, petroleum, and natural gas is implicitly subsidized. On the other hand, the capital-intensive infrastructure sectors important for industry – power, roads, rail, ports, telecom – generally operate at full cost recovery. The infrastructure pricing policy has enabled these networks to expand rapidly. The low price for natural resource use by households, on the other hand, seems an unsustainable choice.

7. Conclusions

Each developing country faces unique challenges and has to find its own way forward. Countries, however, can learn from each other and adapt lessons taken from other experiences. China's success with growth and poverty reduction over a quarter century provides many interesting lessons. On the positive side I have focused on the sound investment climate, openness to foreign trade and direct investment, cost recovery

as a basis of infrastructure expansion, and support to agriculture combined with rural-urban migration as interesting areas that other developing countries might want to study further.

The way in which China has approached reform also provides interesting lessons. Chinese reform is sometimes characterized as gradual, but I do not think that this is an accurate characterization. The actual change in institutions and policies in China over a 25 year period is one of the most remarkable transformations in history. It is hard to find other examples in which there has been so much change in such a short period of time. Rather than gradual, I would call Chinese reform pragmatic and experience-based. China is a large and diverse country. In many sectors there has been a process of pilot testing reform, evaluating results, and scaling up good ideas. Sometimes this has been top-down and deliberate: foreign trade and investment were initially liberalized in special economic zones, and as good results were achieved the trade and investment reforms were then extended to more and more locations. But the experimenting has often been bottom-up as well. Much of the enterprise reform, privatization, and creation of a sound investment climate has been the result of experimentation at a local level. Localities were given the objective of growth and the freedom to experiment. Competition among cities has then led good ideas to disseminate broadly.

If there is a lesson here for other developing countries, it is to be pragmatic about reform. Try out new ideas, evaluate results, and then expand ones that work. There is also a useful lesson here for development agencies such as the World Bank. The World Bank has never had a particularly important financial role in China, but it has financed pilots and innovations in a broad range of sectors. In the early days of reform World

Bank projects supported the development of grain markets, the power tariff reforms discussed above, the use of tolls to finance road construction and management, commercialization of rail and ports. More recently the focus of the program has shifted to environmental and social issues. World Bank-financed projects today support renewable energy technologies (wind, biomass), waste water treatment and clean-up of lakes and rivers, afforestation, urban transport management, rural health and education reform, and programs to help rural migrants integrate into urban employment. China uses the World Bank to help it introduce, evaluate, and disseminate innovations, providing a good model for how the Bank can help in successful middle-income countries.

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Table 1: Growing out of the Plan

	<u>1978</u>	<u>1985</u>	<u>1995</u>	<u>2003</u>
Market price (percent of all goods subject to market price)				
Retail	3	34	89	96
Producer Goods	0	13	78	87
Farm Commodities	6	40	79	97
Ownership of Industrial Production (percent of output)				
SOEs	77	--	33 ^a	22 ^b
Collectives	23	--	36 ^a	6.4 ^b
Foreign, Private, Others	0	--	31 ^a	72 ^b

Sources: Naughton (2006), OECD (2005), China Statistical Yearbook 2006

Notes: a=1996; b=2004

Table 2: World Bank-NBS survey of 12,400 manufacturing firms, 2005

	<u>State-owned</u>	<u>Foreign</u>	<u>Domestic private</u>
Percent of firms			
In sample	8%	28%	64%
Percent of total assets	32%	27%	41%
Rate of return on capital	7%	22%	19%
Employment growth, 2002-2004	-2.9%	11.9%	9.2%

Table 3: Investment climate and openness indicators, China and Africa

	China	Africa	ETH	GHA	KEN	NGA	TZA	UGA
Sales lost from Power outages, 2006 (%)	1.2	4.0	4.6	n.a.	8.0	n.a.	9.5	10.0
Days to obtain Telephone line, 2006	7.1 ^b	34	154.9 ^a	n.a.	99.4 ^b	n.a.	23.3	12.8
Days to register A property, 2006	32	110	43	382	73	80	123	97
Average import Tariff, 2006 (%)	2.1	13.3	18.5	n.a.	6.2	n.a.	n.a.	13.7
Longest time to Clear imports Customs, 2007 (days)	12.3	22.2	25	n.a.	18.1	n.a.	26	17.1
Cost to export, 2006, per Container (US\$)	335	1561	1700	822	1980	798	822	1050

Note: a, refers to data of 2002; b refers to data of 2003; n.a. refers to data unavailable.

Source: World Bank <http://www.enterprisesurvey.org>; and

<http://rru.worldbank.org/DoingBusiness>, and UNcomtrade country data base.

Figure 1. Growth in GDP per capita
1980 - 2005

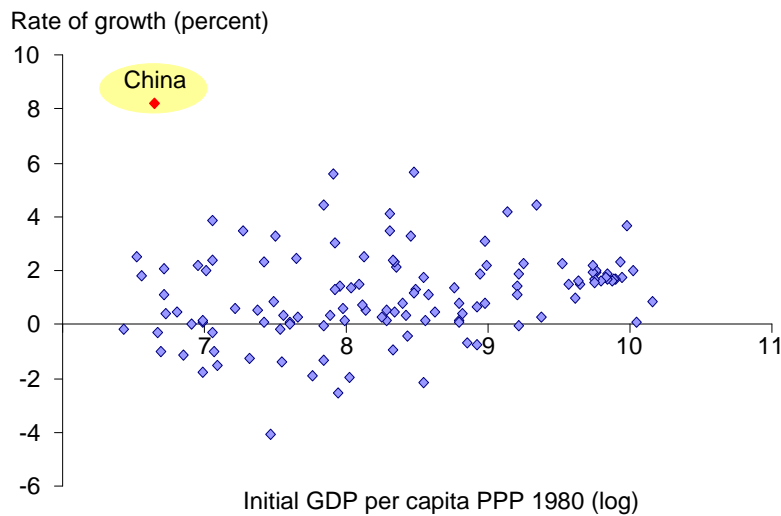


Figure 2. Growth of private firms and city
investment climate, 104 Chinese cities

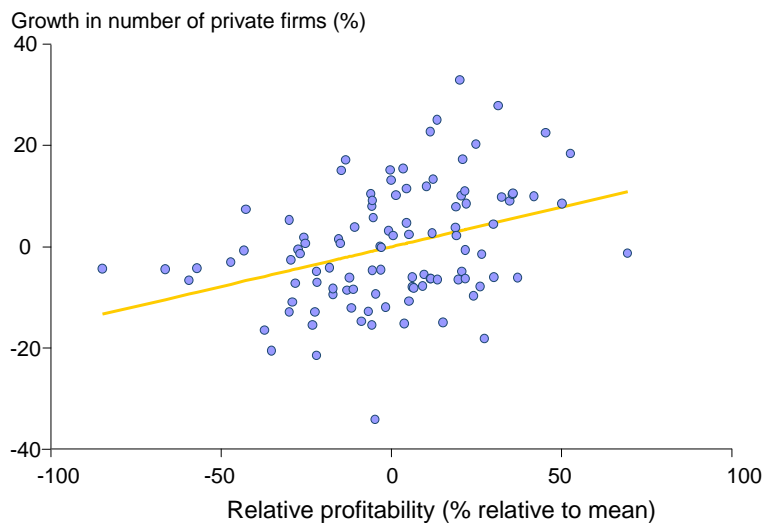


Figure 3. Electricity prices for industry, 2005

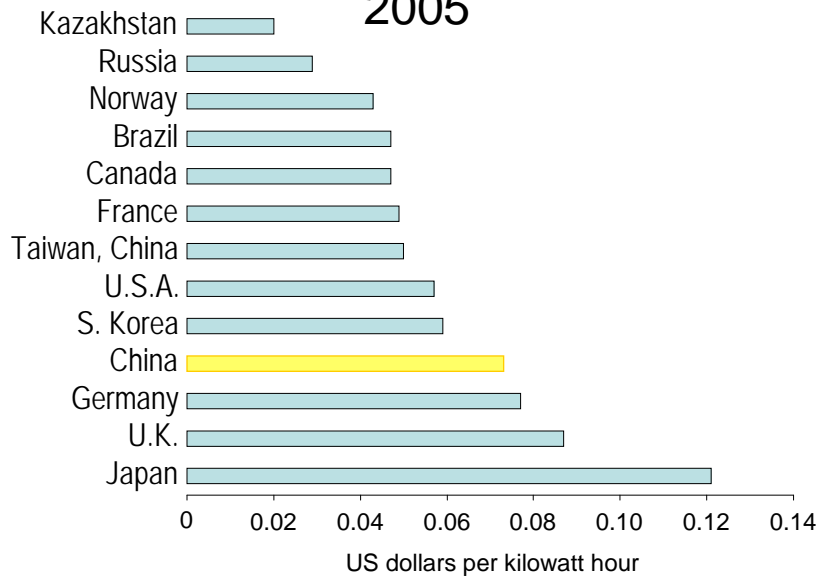


Figure 4. Highway tolls for cars

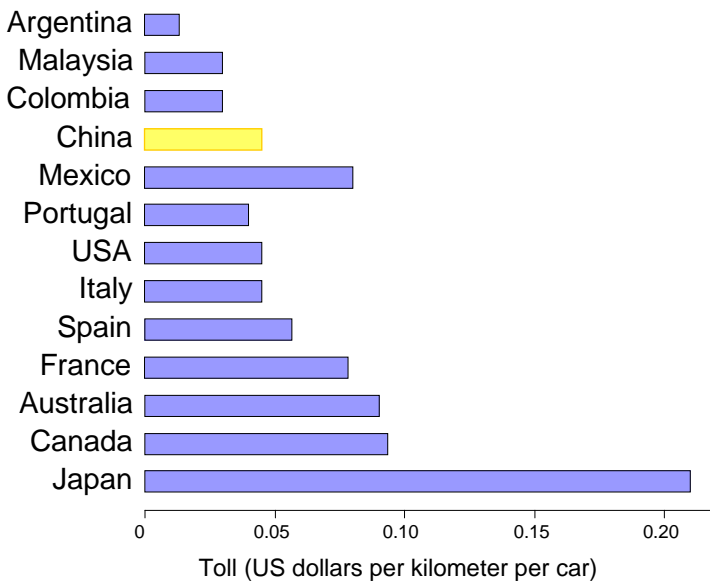


Figure 5. Affordability of highway tolls

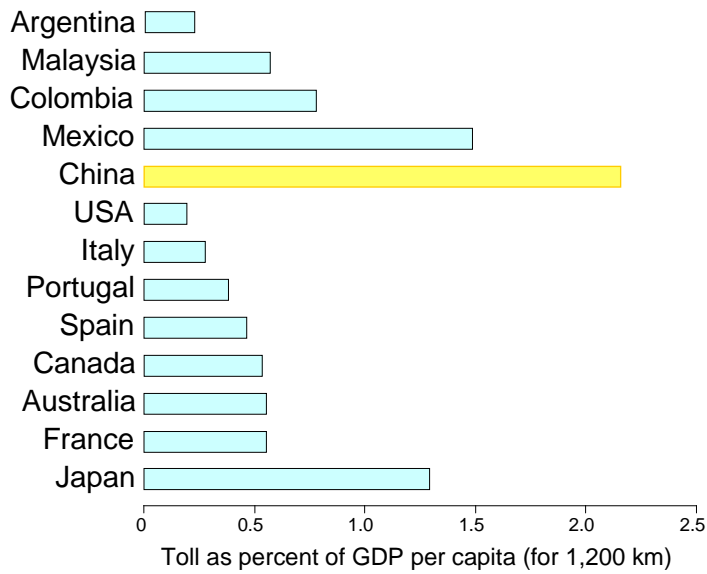


Figure 6. Urban–rural labor productivity differentials

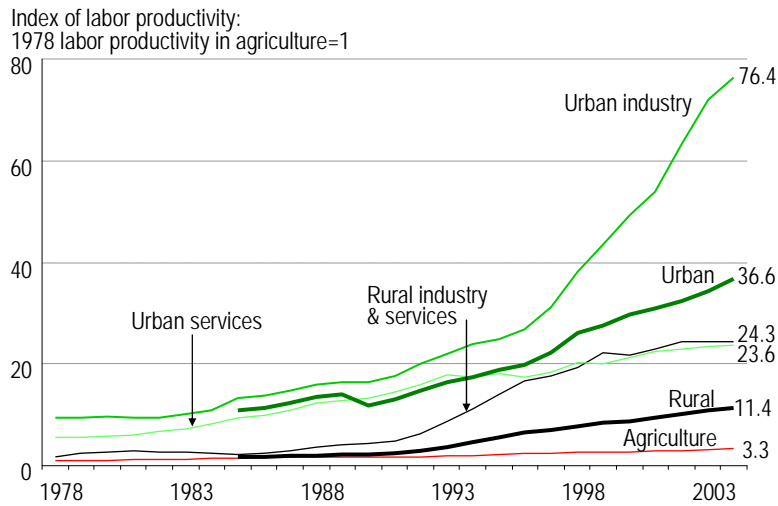


Figure 7. Rural population is moving to cities

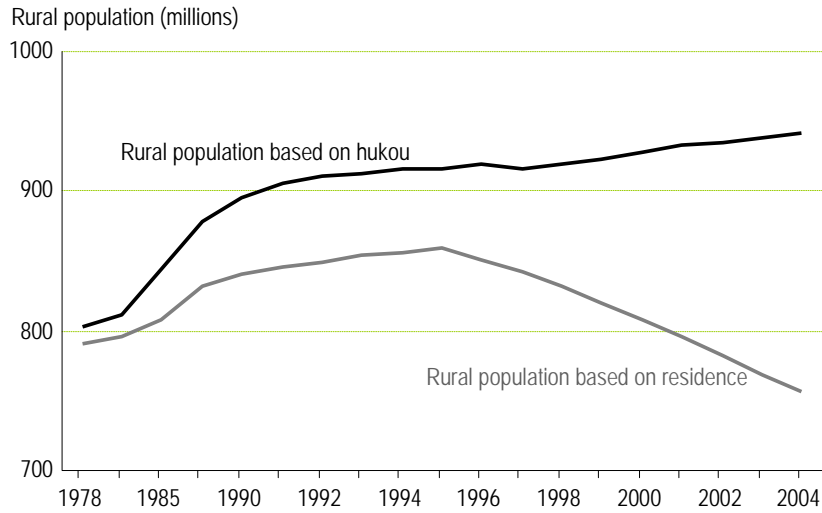


Figure 8. Population growth, 1997-2005, and distance to coast, Chinese provinces

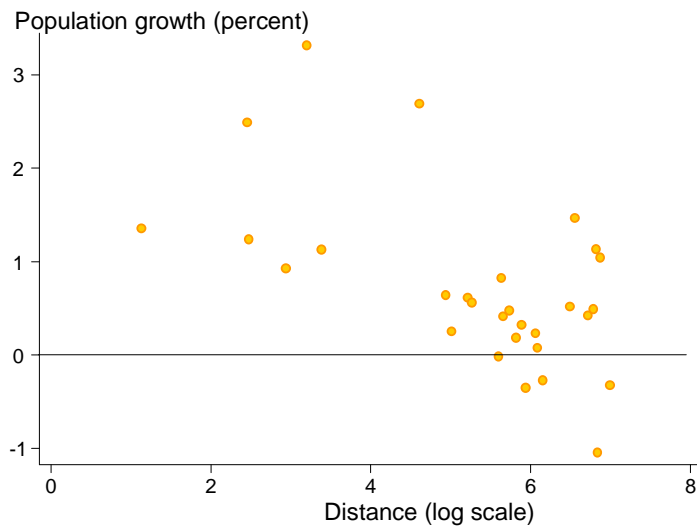


Figure 9. Population growth, 1997-2005, and distance to coast, African countries

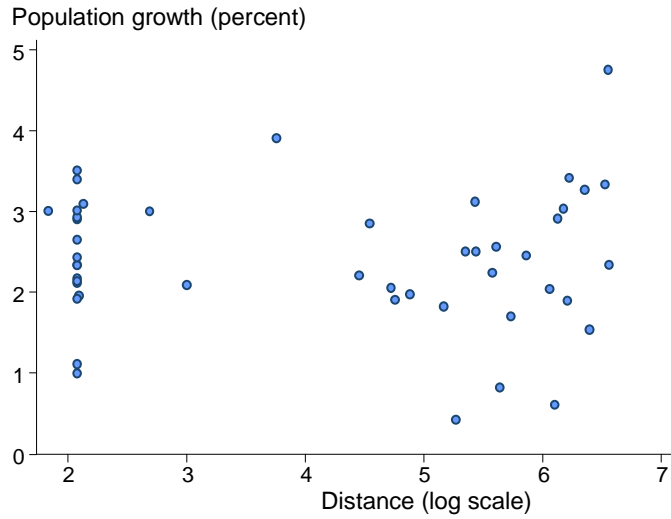


Figure 10. Air pollution is high compared to other developing regions

