China’s Economic “Miracle” in Context

By Derek Scissors

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Key Points

• Contrasting China at various stages of reform to Japan and Korea at analogous stages shows China as less successful. The payoff is personal income, where China’s growth in local currency terms is similar to Japan’s. But it is slower than Korea’s, and, in comparable dollar terms, China is far behind Korea and Japan 40 years into the respective “miracles.”

• In evaluating key contributors to income gains—agricultural productivity, labor quantity and quality, leveraging, and innovation—China failed to extend education in the first 25 years of reform. A recent failure is the explosion in leveraging in the past decade. Other indicators of success roughly match Japan but trail Korea.

• China’s size makes it important even with less development success. For example, Chinese research and development spending affects the world while being inadequate to offset aging and indebtedness. When projecting economic size, though, trend extension is misleading. Korea and Japan illuminate how innovation and other factors will alter China’s trajectory.

Size matters in international economics, and China has it. This will not change whether China becomes the global leader or falls victim to bad policy and stagnation. Prosperity also matters, and China is not prosperous by any reasonable standard. A vital question, therefore, is whether it will become so. There are fewer devout believers in the superiority of state-led development than 10 years ago, but they still exist. Others simply cannot imagine China’s growth stopping, so eventually it must become prosperous.¹

One approach to answering the question, without relying on faith, is to evaluate China’s fundamentals. Another is to run numbers and see what seems plausible. (These can be found elsewhere.)² A third, found here, is to seek historic parallels.

China’s size makes parallels tricky. The US is an obvious choice, but the US started life as a rich economy while China has at times been quite poor. The usual comparisons are to Japan and Korea. The main similarity, of course, lies in postwar expansion, often called economic miracles. Starting at different times, all three countries dramatically improved the lives of their people in a generation.

Japan’s reconstruction started in 1946, Korean reform in 1962, and Chinese reform in 1979. For simplicity, snapshot comparisons are made, bracketed by reform+2 years (so an impact may be seen) and the final observation at reform+38 years. Years +11, +20, and +29 split the sample evenly. For ease of reference, Table 1 shows the years for each country.
Even a China that stagnates as Japan has will be considerably bigger and more economically influential than Japan. Nonetheless, historical comparison to Japan and Korea across a range of indicators shows China’s miracle has faded prematurely, leaving the country far from rich and with little prospect to become so.

**Personal Income**

The indicators showing these shortcomings start with the benchmark for development success—personal income. Predictors of success follow: direct or indirect productivity measures for agriculture, labor, capital, and innovation.

Gross domestic product (GDP) measures economic activity. It is obviously a poor measure of success given that a larger population boosts GDP but not prosperity. India’s recent experience shows GDP can also be hard to measure in developing economies.

**Table 1. Reform Eras**

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<thead>
<tr>
<th></th>
<th>Japan</th>
<th>Korea</th>
<th>China</th>
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<tbody>
<tr>
<td>Reform+2</td>
<td>1948</td>
<td>1964</td>
<td>1981</td>
</tr>
<tr>
<td>Reform+11</td>
<td>1957</td>
<td>1973</td>
<td>1990</td>
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<tr>
<td>Reform+20</td>
<td>1966</td>
<td>1982</td>
<td>1999</td>
</tr>
<tr>
<td>Reform+38</td>
<td>1984</td>
<td>2000</td>
<td>2017</td>
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Source: Author’s determination of initiation of reform and reconstruction.

GDP per capita corrects for size but is an accounting construct that does not reflect individual welfare; it cannot be spent or saved, and its distribution is not meaningful. In China’s case, GDP per capita is badly misleading: in 2018 it was 55 percent higher than the official figure for disposable income.3

Personal income can be hard to measure, as well, and hard to properly compare across economies and
time due to price differences. But it has the enormous advantage of representing true development success, not accounting results with little relevance to quality of life. Difficulties with comparison are partly addressed by using growth rather than levels—for example, growth from reform+2 to reform+11 years. The local currency growth results are more revealing; the one important level is for 2017 in US dollars (Figure 1 and Table 2).

Local currency results ignore occasionally stark devaluations and more gradual appreciations. China is massively outperformed by South Korea until the last stage of the reform era. This reflects Beijing’s channeling of income from households through a noncommercial banking system to state-owned enterprises, which serve as economic tools of the Communist Party. Even so, China outperforms Japan on a local currency basis.

Precision is impossible, but, compared to the rest of the world at the time, Japan’s starting income was probably considerably higher than China’s $175 or so in 1978. This bears out in the dollar results. The China-Korea pattern repeats, and even China’s faster growth in the last stage produces an income level less than half of Korea’s in dollar terms at reform+38. In dollar terms, China trails Japan in growth and finishes one-third lower in income, even ignoring the ensuing 33 years’ worth of inflation.

Chinese income could be understated due to private-sector fear of confiscation by the state. Otherwise, China’s relatively weak performance on personal income here may come as a surprise, since it is obscured by widespread fetishizing of GDP and, more reasonably, China’s outperformance in the last stage of reform. If China could sustain the most recent trend, it could narrow the income gap, especially given Japan’s ensuing struggles in the 1990s and beyond. The combined evidence from other indicators, however, says this is highly unlikely.

### Table 2. Personal Income in US Dollars, Percentage Increase

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<th>Japan</th>
<th>Korea</th>
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<tr>
<td>Reform+11/Reform+2</td>
<td>170</td>
<td>215</td>
<td>6</td>
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<tr>
<td>Reform+20/Reform+11</td>
<td>160</td>
<td>345</td>
<td>135</td>
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<tr>
<td>Reform+29/Reform+20</td>
<td>350</td>
<td>270</td>
<td>255</td>
</tr>
<tr>
<td>Reform+38/Reform+29</td>
<td>115</td>
<td>41</td>
<td>175</td>
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### Agriculture Productivity

Agriculture productivity is the first cornerstone of development. It is tied to both income levels for the bulk of the population at the time and development of a national labor market. As productivity improves, some farmers become unnecessary and can migrate if work is available in cities. In this way, land then labor are the dominant contributors to growth in early to mid-economic development, before giving way to capital then innovation.

A key measure of agricultural productivity is cereal yield (Figure 2). Chinese agriculture productivity is not ideal. Despite the benefit of 17 more years of technological progress, yields are inferior to Korean agriculture at each step. Nonetheless, yields essentially match Japan’s at reform+38 and are growing faster. Chinese agriculture productivity in 2017 had not yet flattened out and therefore could be compatible with becoming a rich country.

The problem lies in translating the marginal productivity seen in yields to income. Countries striving to become prosperous cannot afford to still have large, low-productivity rural populations. At reform+38, the income of rural Japanese was more than double that of rural Chinese in nominal terms, much less adjusting for the 33-year calendar gap. The obvious explanation is Japanese farmers owned their land in 1984 and Chinese farmers could not in 2017. A related factor is rural Chinese received about half their income from farming proper while rural Japanese got less than one-fifth (although data may not be comparable).
Figure 2. Japan, Korea, and China: Cereal Yields


Labor Productivity

The quantitatively preeminent factor in China’s rise is successful utilization of its huge labor force. (See most Middle East economies for what could have happened.) In contrast, an aging labor force is a formidable obstacle to raising income, as fewer workers must support more pensioners, directly or indirectly. Japan’s growth has been ravaged by aging, and Korea is next. China still has more than a decade before a plunging quantity of labor halts income gains, but it faces additional, serious problems Japan and Korea did not.

Median age of the population provides a partial explanation for China’s development and a warning about its trajectory. China is older than Korea at the start of the reform process and becomes notably older than Japan during the trip (Table 3). Japan reaches China’s reform +38 age at +44 while Korea reaches it at +47—extra years to work with. Worse, United Nations projections show China’s aging accelerating through 2035. China is older than Japan and Korea in development terms, and its aging will accelerate—all at a lower income level.

Age is a proxy for the quality of labor but includes a hefty financial component in terms of economic impact. A supplementary measure of labor quality is life expectancy. Table 4 credits the pre-reform People’s Republic but implicitly undermines reform results. China provided, at least on paper, much higher life expectancy at the start of economic expansion than Japan or Korea. But this means powerful opportunities for income growth were missed while life expectancy was successfully increased pre-reform, which fits China’s weaker income performance since. China’s praiseworthy life expectancy at reform +38 further indicates the time for rapid growth is near an end.

When labor forces shrink due to aging, it puts an ever-increasing premium on productivity. It is a premium China cannot pay, because education is crucial to productivity and China’s education levels are inadequate (Figure 3). While previous
indicators show comparability between China and Japan, mean years of schooling do not. At reform+38, China is roughly where Japan was at reform+2. Korea started where China did, but then vastly outperformed it.

One reason is size. China’s development is more important than Japan’s or Korea’s because it is much bigger. But for the same reason it is also incomplete; it is more difficult to educate so many people. Beijing has compounded the problem with discrimination, featuring sharp limits on education access for those living away from their site of legal registration and legacy effects that endure even after formal policy changes. This is an important cause of China’s comparatively weak income results and may cap its long-term growth at half the present pace.9

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<th>Table 3. Median Age, Years</th>
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<td>Reform+2</td>
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<th>Table 4. Life Expectancy, Years</th>
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<td>Reform+2</td>
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<td>Reform+29</td>
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<td>Reform+38</td>
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Return on Capital

The most basic way to measure return on capital is to see how much money is needed to generate growth. In these three cases, the domestic capital market has been more important over the full period of reform than foreign capital. China and Japan have been large external net creditors for a good portion of the period studied. Korea faced external debt challenges, but these were limited in extent and duration. The primary issue has not been access to foreign creditors but how effectively domestic capital has been used, frequently referred to as leveraging.10

![Figure 3. Mean Years of Schooling](source: Wittgenstein Centre, Human Capital Data Explorer, http://dataexplorer.wittgensteincentre.org/wcdev2/; and simple interpolation by the author.)
Domestic credit is composed of corporate, government, and household shares. Combining these and scaling for size measures the macroeconomic return to capital—how much credit is being issued per unit of growth. Data are spotty at the start of the postwar period but then improve and are compiled via a largely similar method across time and economy (Figures 4 and 5).

Corporate borrowing predominates throughout the three countries’ reform eras, with government and household credit rising near the end. China appears to start with far more corporate debt. This may be an accounting result reflecting face-value obligations of state enterprises to the government. Given that, Korean credit per unit of GDP (national wealth data are not available until late) accumulates
Figure 6. M2/GDP


considerably faster than China’s from reform+2 to reform+29. Then the results shift violently, as Chinese borrowing spirals. Korean figures since reform+38 have spiked but still have not reached China’s despite the extra 17 years. China initially fares better than Japan. Although the start is unclear, the two are essentially comparable at reform+20. Japan’s credit position deteriorates more than China’s by reform+29 and, viewed in isolation, looks quite poor at reform+38. Still, deterioration in China’s implied return on capital from 2008 to 2017 is far worse than Japan’s for 1975-84. Not long thereafter, of course, Japan entered a 30-year period of near-stagnation.

Broad money supply (M2) does not represent credit directly, but it is difficult for M2 and credit to move in different directions for long. Figure 6 therefore serves to check the robustness of the credit results, especially the long-term trend.

Results are similar, with China starting and ending with the highest levels and Korea starting and ending with the lowest. The comparative stability in Korean M2 is reflected in the low level of outstanding credit in the sample. By 2017, Korean M2/GDP soared past 150 percent. Japan’s soared past 250 percent. In this sense, China appears more “advanced.” But the more intense monetization of the economy has not helped Japan and occurred as Korean growth slowed. China already looks that leveraged, too early.

A Stab at Innovation

Historical data on innovation are almost a lost cause. Useful data are hard to come by even today—hence a constant stream of vague assertions about artificial intelligence and the like.

An attempt to quantify innovation over time is nevertheless worthwhile. The belated recognition that weakness in land, labor, and capital portends medium-term stagnation has caused the Chinese government and foreign defenders of its economic model to cite innovation as riding to the rescue. And innovation does permit the same quantity of land, labor, and capital to be more productive.
Figure 7. R&D Spending, Share of GDP


Research and development (R&D) spending is a standard measurement of national innovation. Historical statistics are limited. Both Japan and Korea appear to outperform China through the development process as a whole. But data quality is highest at reform+38, and the gap is small by that time (Figure 7). And while Japan’s R&D share has risen since 1984 and Korea’s has spiked since 2000, China’s larger GDP means it spent far more in gross terms at reform+38.

Chinese investment is subject to unproductive fads, and R&D is no exception. Patents granted is a quality measure that potentially corrects for misleading quantity. But patents themselves can be misleading for various reasons. One is that larger economies and more populous countries require more patents to drive economic progress. For example, Israel needs comparatively few to be a technology-led economy. Figure 8 follows standard practice in deflating patents by population.

China follows Korea’s path, if trailing badly at the end. Patents are initially negligible then spike.

Befitting its status as a rebuilding rich economy after the war, Japan is more innovative for decades, before being passed by a soaring Korea. After the sample period, both Japan and Korea saw annual gross patents granted triple, then cycle below that peak.

The easy conclusion is that many more Chinese patents are likely in coming years, pushing them toward Korea reform+38 levels per million people. While Korea then climbed still higher, China’s raw number of patents could be enormous, strongly affecting global innovation even if insufficient to lead a large economy. This would reconcile the two views of Chinese innovation; it can be both globally important in terms of raw size and domestically inadequate for a large economy trying to follow the “miracle” trajectory.

Development Implications

If China’s own GDP reports are the barometer of success, analysis is unnecessary; a gradual, smooth
decline in growth is guaranteed. But genuine development requires prosperity. Over a matching time period, China has failed to raise incomes to where Japan and Korea did, even granting understatement on the Chinese side.

Further, predictors of growth say China faces the same level of challenge Japan and Korea have already faced or worse, so future gains may be more limited. The first development step is making some farmers unnecessary and encouraging productivity-enhancing migration. Crop yields show China has done that successfully, and greater development success is possible. But rural incomes remain unpleasantly low due to poor policy choices concerning land ownership and rural education.

Such choices show up clearly in national labor statistics. First Japan, now Korea, and (demographically) soon China are aging societies. At comparable development times, China is older and, due to more unwise policy choices, projected to age faster.

Nor can it offset declining quantity with rising quality. Even much higher educational attainment has not been enough for Japan to grow in the face of aging, and China’s education levels are its clearest comparative weakness. A succinct argument for China being doomed to stagnation is that, in the pre-reform era, it raised life expectancy without raising income and, in the reform era, it is failing to raise educational attainment prior to crippling aging.

Automation to the rescue? Transformative automation on China’s scale requires truly prodigious amounts of capital. China is already more leveraged, especially on the corporate side where automation would occur, than Japan was at a comparable time of development. It is far more leveraged in all respects than Korea at comparable times. China’s track record in the past decade is not to allocate capital effectively to offset rapid aging and poor education but to extend progressively more credit while seeing progressively smaller gains.

Neither labor nor capital can push income much higher, therefore, unless innovation sharply increases returns. China’s R&D spending is encouraging, though recent increases must be sustained to reach later-stage Japanese and Korean allocations. The patent story is improving but weaker. The gross quantity of Chinese patents will affect global innovation. Becoming an innovation-led large economy is a
much bigger challenge, however, and patents show China is not on course to meet it. The Chinese government and many foreign observers, supportive and critical, treat the country as if it is already a development success. Korea was a development success 38 years after the start of reform, with an income level roughly twice that of China's at a comparable time. China has much further to go. Nonetheless, policymaking focuses on financial tinkering instead of fundamental pro-productivity reforms. China has come a long way. Regarding what is next, the Japanese and Korean experiences indicate it is falling short.

About the Author

Derek Scissors (derek.scissors@aei.org) is a resident scholar at AEI and insists he is not just a US-China trade gossip columnist.

Notes


4. A potential solution is computation of purchasing power parity. This has been done by the World Bank and others but is deeply flawed. See Scissors, “US-China.”


