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# Rebalancing China's Growth

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The sustainability of China's growth has moved center stage. After three decades of exceptionally rapid growth, the sustainability of this growth in terms of the environment, social stability, and even GDP growth itself is being widely debated. As a harmonious society—one of the proclaimed goals of China's leadership—aims for more equitable and environmentally sustainable growth, the quality and efficiency of growth are now as important as its speed.<sup>1</sup>

This chapter argues that more sustainable growth requires greater reliance on services and less on industry, more reliance on factor productivity growth and less on capital accumulation, and more reliance on domestic demand and less on net exports. It reviews China's growth experience over the past 30 years, identifies key imbalances in China's growth pattern, and provides two policy scenarios for China's future, one illustrating the consequences of continued growth along past trends and the other spelling out the implications of a set of policies that would rebalance the economy in the direction of meeting the goals of a harmonious society.

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1. Premier Wen Jiabao in his *Report on the Work of Government* to the 2007 National People's Congress announced that China would move from rapid and efficient growth to efficient and rapid growth, emphasizing efficient growth.

**Table 3.1 Explaining China's growth, 1978–2005**  
(average annual increase, percent)

| Source  | 1978–93 | 1993–2005 |
|---|---------|-----------|
| GDP growth  | 9.7     | 9.6       |
| Total employment growth                                 | 2.5     | 1.1       |
| Labor productivity growth                               | 7.0     | 8.4       |
| From TFP growth   | 3.3     | 2.8       |
| Of which: From reallocation of labor<br>between sectors | 1.3     | 1.1       |
| From increasing human capital                           | 0.5     | 0.2       |
| From increasing capital/labor ratio                     | 3.2     | 5.3       |
| <i>Memorandum item:</i>                                 |         |           |
| Investment/GDP ratio (period average, percent)          | 29.9    | 36.8      |

TFP = total factor productivity

Note: Methodology as in Kuijs and Wang (2006) but adjusted to identify the contribution of human capital and using revised GDP data. Assuming Cobb–Douglas technology and a capital–output ratio of 2.4 in 1978 (as in Wang and Yao 2002, Chow 1993, and Hu and Khan 1996), depreciation of 5 percent per year (as in Wang and Yao 2002), and an elasticity of output with respect to labor of 0.5, as in Wang and Yao (2002), and broadly the average of the range. The update presented in this table further separates out an estimate of the contribution of human capital accumulation, using Barro and Lee (2000) data and an assumption of the rate of return to education of 10 percent.

Source: He and Kuijs (2007).

## China's Past Growth Performance

China's growth over the last 30 years is in a league of its own. Since the 1978 reforms, annual GDP growth has averaged more than 9.5 percent. This rapid growth has lifted hundreds of millions of people out of poverty. The poverty rate, measured as \$1 a day of purchasing power parity (PPP) consumption, fell from over 60 percent of the population in the early 1980s to 10.3 percent in 2004 (Ravallion and Chen 2004, World Bank 2006), lifting some 500 million people out of poverty over that period. However, not everyone has benefited equally from growth, and income inequality has risen after an initial decline in the early years of reform that focused on rural reforms. China's Gini coefficient<sup>2</sup> increased from 0.25 in the mid-1980s to more than 0.45 today.

Using a growth accounting framework, China's growth can be decomposed into contributions of employment, capital, human capital, and total factor productivity (TFP) growth. The estimates in table 3.1 show that the contribution of capital accumulation to GDP growth was significantly

2. The Gini coefficient is used as a measure of inequality in income or wealth distribution. 0 corresponds to perfect equality and 1 to perfect inequality.

larger in the period 1993–2005 than it was in 1978–93, reflecting rapid growth in investment over the last decade. Meanwhile, TFP growth declined after the first period, and its contribution to GDP per employee dropped from almost 50 percent in 1978–93 to about a third in 1993–2005.<sup>3</sup> The contribution of capital accumulation to labor productivity growth increased to 5.3 percentage points in 1993–2005, a very high figure compared with other countries. High capital accumulation explains more than two-thirds of the difference in labor productivity growth between China and other countries or regions. With overall employment growth slowing, the contribution of labor growth has been modest, especially over the last decade. Human capital's contribution to growth is also modest. China started its reforms with an already fairly high level of human capital—measured as the number of years of schooling in the working population—but progress since then has been unremarkable. The recent sharp increase in tertiary school attendance is likely to change that in the future.

An important feature of China's growth is that much of GDP growth since the early 1990s has come from rapid growth of industrial production. Industrial value added increased, on average, 12.6 percent per year during 1990 and 2006, and the share of industry in GDP rose from 42 percent in 1990 to almost 49 percent in 2006 in current prices, among the highest for any country since the 1960s.<sup>4</sup> In 2003–06, industry contributed 60 percent of total GDP growth, compared with 6 percent by agriculture and 34 percent by the services sector. Industrial growth has largely been in the form of higher labor productivity, much of it in the form of rising within-firm productivity.

## China's Unbalanced Growth

China's record growth performance has come at a price. The current growth pattern relies heavily on manufacturing, investment, and external demand. The accompanying large and growing current account surpluses have become an issue in the international arena, whereas domestically, the accumulation of international foreign exchange reserves is not only becoming increasingly a macroeconomic issue but also signifies a suboptimal allocation of resources from China's point of view. China's reliance on manufacturing, especially heavy industry, has become a growing burden on the environment and made the country increasingly dependent on imported energy resources. Finally, China's rapid growth has been asso-

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3. They suggest the difference may be because of a different assumption for the elasticity of output with respect to capital.

4. In fact, the increase would have been larger but for declining relative prices of industry. In constant 1995 prices, the share of industry in GDP rose from 37 percent in 1990 to 53.5 percent in 2006.

**Table 3.2 Savings, investment, and current account in China**  
(percent of GDP)

| Item                                    | 1996 | 2000 | 2002 | 2004 | 2006 |
|---|------|------|------|------|------|
| Gross domestic savings                  | 40.7 | 36.9 | 37.6 | 43   | 50.6 |
| Households                              | 20.1 | 14.8 | 16.3 | 15.4 | 15.3 |
| Enterprises                             | 15.6 | 15.3 | 14.4 | 19.8 | 28.3 |
| Government                              | 5.0  | 6.8  | 6.9  | 7.8  | 7.0  |
| Gross capital formation                 | 40.4 | 35.1 | 37.9 | 43.3 | 44.9 |
| Net factor income plus net transfers    | -1.2 | -0.7 | -0.1 | 1.0  | 1.0  |
| Gross national savings (above the line) | 39.5 | 36.1 | 37.4 | 44   | 51.6 |
| Discrepancy                             | 1.8  | 0.7  | 2.9  | 2.8  | 2.8  |
| Gross national savings (below the line) | 41.3 | 36.8 | 40.3 | 46.8 | 54.4 |
| Current account                         | 0.8  | 1.7  | 2.4  | 3.6  | 9.5  |

Sources: National Bureau of Statistics of China; authors' estimates.

ciated with rising income inequality, which has become a key issue in the political debate in China. Addressing the imbalances in China's growth has become the main driver of the policy agenda as included in the 11th Five Year Plan.

### China's Macroeconomic Imbalances

By definition, the current account surplus of a country equals the surplus of savings over investment. China's traditionally high saving rates have risen even further in recent decades. Investment rose with savings, but less rapidly, and as a result, China's current account surplus has boomed. Contrary to popular thinking, the recent increase in savings did not come from households: Household savings at around 30 percent of disposable income is high but no higher than the savings of other rapidly growing Asian countries. The bulk of the increase has come from enterprises, the savings of which, calculated as retained earnings plus depreciation charges, have boomed in the last decade (table 3.2).

China's high and rising savings combined with its managed capital account has been a main driver of the country's capital-intensive, industry-led growth. This growth pattern has served the country well in many respects. High saving and investment, combined with respectable rates of technological progress, mean that China's production capacity grew rapidly. In recent years, potential GDP growth, or the capacity to produce, has increased in line with actual GDP growth to over 10 percent per year. This means that the economy can grow rapidly without running into the problems that emerging markets often run into, such as high inflation, large current account deficits, and bottlenecks in the real economy.

**Table 3.3 Growth patterns on past trends** (percent)

| Source   | 1993–2005 | On past trends |         |         |         |
|--|-----------|----------------|---------|---------|---------|
|  |           | 2005–15        | 2015–25 | 2025–35 | 2035–45 |
| GDP growth <sup>a</sup>                                      | 9.6       | 8.3            | 6.7     | 5.6     | 4.6     |
| Total employment growth                                      | 1.1       | 0.1            | –0.5    | –0.9    | –1.1    |
| Labor productivity growth                                    | 8.4       | 8.1            | 7.2     | 6.6     | 5.7     |
| From TFP growth  | 2.8       | 2.5            | 2.2     | 1.9     | 1.6     |
| From higher capital/labor ratio                              | 5.3       | 5.3            | 4.7     | 4.4     | 3.8     |
| From higher human capital                                    | 0.2       | 0.3            | 0.3     | 0.3     | 0.3     |
| Investment/GDP ratio<br>(period average, percent)            | 37        | 44             | 49      | 55      | 60      |
| Share of industry in GDP<br>(end of period)                  | 49        | 50             | 50      | 51      | n.a.    |
| Share of employment in agriculture<br>(end of period)        | 45        | 38             | 36      | 33      | n.a.    |
| Urbanization rate (end of period)                            | 43        | 50             | 52      | 55      | n.a.    |
| Urban-rural income disparity<br>(end of period) <sup>b</sup> | 3.8       | 4              | 4.4     | 4.6     | n.a.    |

n.a. = not applicable

TFP = total factor productivity

a. Potential GDP growth. In 2005–07, actual GDP growth is assumed to differ from potential GDP growth. From 2008 onward, actual growth is assumed to equal potential.

b. 2002 prices.

Sources: National Bureau of Statistics of China; authors' estimates.

At the same time, China's growth pattern has its macroeconomic downsides. First, it may not be possible to finance the current capital-intensive mode of growth in the long run. Over time, economic growth has increasingly relied on capital accumulation and less from employment and TFP growth. If China's rapid growth continues in its current mode, the investment rate will need to increase to 50 to 60 percent of GDP in the decades ahead (table 3.3), which will be difficult to finance given the pressures for savings to fall, including from demographics. Moreover, investment as such does not contribute to a population's standard of living.

A second macroeconomic downside is that this pattern of growth has created fewer urban jobs than a more labor-intensive pattern and has in the process increased urban-rural inequality. Industry creates fewer urban jobs than services, and in 1993–2005, six-sevenths of the growth in industry has come from increased labor productivity instead of new employment, with industrial employment growing 1.6 percent per year in 1993–2005, compared with value-added growth of 11.2 percent.

Third—and most central to the US debate about China—a significant part of China's growth stems from increasing production of manufactured

goods with a tendency to boost current account surpluses. Although demand and supply in China's economy are growing broadly in line with each other, a significant share of the demand comes from abroad, not from Chinese households and businesses. Under such an investment-heavy, export-oriented pattern of growth, production in China increasingly outstrips domestic demand. From an external perspective, accelerating manufacturing production means continued strong export expansion, whereas import growth has been more subdued, partly because of increased import substitution. As a result, the current account surplus is rising steadily: Having reached 9.5 percent of GDP in 2006, it has become the key source of China's impressive balance-of-payments surpluses. As the People's Bank of China buys the associated foreign exchange, it needs to sterilize the purchases by issuing central bank paper, which creates tensions and risks in its balance sheet, keeps domestic interest rates low, and has started to feed a rapid rise in asset prices. A large difference between production and domestic demand in China can contribute to global imbalances and trigger trade tension, which could over time undermine other countries' willingness to further open up, and thus reduce growth prospects for China to grow.

## Environmental Strains

China's heavy reliance on industry for growth has put increasing strains on the environment.

- The energy intensity (energy use per unit of output) is some 4 to 6 times that of advanced countries, measured in current dollars. China's high share of industry in the economy, which is 4 or more times those of advanced countries, largely explains this discrepancy, but even at the level of industry it is still some 1.5 to 2 times higher than it is in advanced economies.<sup>5</sup> The changing pattern of energy use has resulted in steeply rising consumption of fuels and increasing imports of petroleum (Berrah et al. 2007). Reliance on coal for 71 percent of the total energy consumed and the rapid spread of motorization has intensified air pollution and contributed to greenhouse gas emissions.
- Although the average pollution index for China's cities has improved in the past decade, poor air quality is still a very visible issue in China, and costly, especially in large cities: 16 of the 20 cities with the worst air pollution in the world are in China, and according to the State Environmental Protection Agency (SEPA), two-thirds of China's urban

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5. If measured in PPP in contrast, China uses as much energy per output as the United States.

population breathes air of substandard quality. Particle matter, SO<sub>2</sub>, NO<sub>x</sub>, and other pollutants are, according to the World Health Organization, the cause of 250,000 premature deaths each year. A recent study by SEPA and the World Bank (2007b) estimates that the health costs of air pollution amount to 3.8 percent of GDP. In addition, one-third of China's landmass regularly experiences acid rain according to SEPA, causing an estimated damage of some \$13 billion, or 1 percent of (2003) GDP per year.

- Water is becoming increasingly scarce relative to the nation's requirements. The country has only one-third of the world average in water availability and low efficiency of water usage: China used 537 cubic meters of water to produce RMB10,000 of output, four times the world average (World Bank 2007a). In individual industries, water usage is 5 to 10 times that of advanced countries. The use of recycled water in industry reached barely 50 percent, compared with 75 to 80 percent in advanced economies.

Thus, despite China's remarkable progress, it still has a long way to go to make its growth more environmentally sustainable. The route ahead is likely to be more difficult, as the relatively easy gains that were achieved by moving away from the inefficiencies of central planning have been realized already. Arguably, as China grows richer, the demand for higher environmental standards will also grow, requiring the country to balance the apparently conflicting goals of economic growth and the environment.

China's environmental issues also have a global dimension: The International Energy Agency estimates that the country will become the largest greenhouse gas emitter in the world by the end of the decade; some say the country already is.<sup>6</sup>

## Rising Income Inequality

The current growth pattern has contributed to growing inequality. Accumulation of capital in urban industry has led to starkly widening productivity differences, which in turn have led to large income inequalities. With an estimated Gini coefficient of more than 0.45, China is now less equal than the United States and Russia and, given current trends, is akin to Latin American countries in income inequality.

China's rising inequality resulted in part from the country's development strategy. Heavy investment in manufacturing created jobs for only a limited number of people, and urbanization and decline in low-productivity agricultural unemployment have been less than one would expect based on China's growth and level of income. China's coastal

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6. Data are from the World Bank, *World Development Indicators 2007*, and authors' estimates.

development strategy increased interprovincial inequalities, whereas the country's household registration system hampered rural citizens in competition for higher-paying urban jobs.<sup>7</sup> And China's heavy reliance on investment and manufacturing meant that urban formal-sector jobs rapidly became more productive, and wages rose in line. As a result, agricultural incomes increasingly lagged behind average income per capita, contributing to inequality. More recently, intraurban and intrarural inequality has risen as well.

## Future Consequences of the Current Growth Pattern

Based on current trends, China's three imbalances—investment- and industry-driven growth, environmental strains, and income inequality—are likely to worsen. To illustrate this, we develop a growth scenario that broadly incorporates the features of past growth and extrapolates this to the year 2035. The scenario is developed with the use of the computable general equilibrium (CGE) model for the Chinese economy from the Development Research Center (DRC).<sup>8</sup>

In the past-trend scenario, growth remains largely investment-led and driven by industry. Thus it has high savings and high investment, with corporate savings playing an important role while household savings also remains high. Patterns of employment growth and TFP are expected to continue as they have in recent decades, that is, employment grows somewhat slower than the working age population and TFP edges downward over time. This scenario is calibrated as follows. Employment is projected using demographic projections. Using a Cobb-Douglas production function, we calculate how much investment is necessary to reach a target rate of growth of GDP, assuming some moderation of TFP growth over time. The target rate of GDP growth is over 8 percent from 2005 to 2015 and under 7 percent from 2015 to 2025 (table 3.3).

The DRC's CGE model suggests that with a policy setting on past trends, the share of industry in GDP ("secondary industry") would increase another 3.5 percentage points between 2005 and 2035. The share of services ("tertiary industry") would also increase by around 5.5 percentage points in this period, but the tertiary sector would remain smaller than the secondary sector through 2035. The calibration mentioned above requires an investment-to-GDP ratio of almost 50 percent, on average, from 2015 to 2025 and a higher percentage later. In this scenario, we assume that

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7. China's household registration system, or *hukou*, has been in place since the 1950s. The system tied most citizens to their place of birth, as health care, education, social security, housing, and previously food grain were only available in a citizen's locality of registration.

8. For a detailed description of the model, see He and Kuijs (2007).

the policies that affect saving and investment patterns remain unchanged. Consistent with that, we find broadly extrapolated sectoral patterns of saving and investment. In particular, with unchanged policies affecting industry and services, dividends, the labor market, and the financial sector, enterprise investment increases further over time in an increasingly industry- and enterprise-led economy, with the increase matched by higher enterprise saving.<sup>9</sup> With unchanged policies on health, education, and the social safety net, household saving also continues to rise. In all, in line with recent patterns, the current account surplus remains high despite high and increasing investment.

In our industry-led scenario, energy and resource intensity would continue to be high, and pollution and emissions would continue to rise rapidly. Limited urban job creation would further accentuate urban-rural income disparity and overall inequality. Such a scenario would see only moderate urban employment growth and a moderate labor flow out of agriculture, leaving a relatively large share of people employed in agriculture. In 2035, 33 percent of total employment would still be in agriculture, a high share for a country with a per capita income projected at \$10,000 in 2035 (in 2000 international prices). Consequently, urbanization would continue, but at a modest rate, reaching around 55 percent in 2035. The productivity gap between agriculture and the rest of the economy would rise from an already high 6 to over 8 times by 2025. The rural-urban income disparity would remain high, with urban per capita incomes 4.6 times higher than rural ones (in constant prices) in 2035, compared with 3.8 times in 2006.<sup>10</sup> Income inequality as measured by the Gini coefficient rises further, from 0.46 in 2005 to 0.48 in 2035.

The model suggests that it will be increasingly difficult for China to continue with its current pattern of growth, economically, environmentally, socially, and internationally. China's government is fully aware of these constraints and is seeking to change China's pattern of growth. The current 11th Five Year Plan has this new growth pattern as an explicit goal. The harmonious society is seeking still rapid but more equitable and sustainable economic growth. A host of measures and policies to achieve this have been announced, and explicit targets on pollution and energy use have been set in the plan and are being used to hold local government officials accountable for results. The questions are whether such goals are feasible and whether government has the tools to turn around current growth trends. China's past attempts to change the pattern of growth,

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9. In the sectorally disaggregated saving-investment projections, we assume that household investment and government investment are constant as a share of GDP. Much of enterprise investment is saved by the enterprise sector, in line with recent patterns.

10. The urban-rural real income disparity is smaller than the productivity disparity because of factors including nonagricultural income of rural people.

while modestly successful, have largely relied on administrative means. These means may not work effectively in China's highly decentralized environment, where local governments face stark conflicts among the emerging objectives of growth, environmental sustainability, and equity.

## **An Alternative Growth Strategy for China**

Rebalancing the economy and striving for a harmonious society have now firmly become key economic policy objectives in China. As presented at the National People's Congress in March, the government's 2007 work programs indicated that, while rapid economic growth remains important, the government aims to improve the quality of economic growth, rebalance the growth pattern, and strive toward a harmonious society. The government would like to change China's growth to be less intensive in resources and capital, cleaner, more knowledge driven, and more equally distributed. On the macroeconomic side, the government would like to change the composition of demand to rely more on consumption and less on exports and investment and reduce the external surplus.<sup>11</sup>

Broadly, five types of policies would help rebalancing. In many of these areas, policy plans or proposals are in the pipeline. That does not guarantee that they will be introduced soon, as it is difficult to implement policies with short-term costs to certain segments of the population. The types of policies we use to illustrate a rebalancing scenario are:

- several macroeconomic measures—largely fiscal—to stimulate domestic consumption, reduce saving, and stimulate the services sector;
- several price and tax measures to help rebalancing by readjusting the relative attractiveness of manufacturing production (tradables) over producing services (nontradables);
- relaxed restrictions on the movement of labor and land transactions to facilitate rural-urban migration and mitigate rural poverty. The fiscal system could be improved to provide host cities with more incentives to deliver social services to incoming migrants;
- institutional reforms to give local decision makers stronger incentives and better tools to pursue rebalancing. Central here is the performance evaluation of local officials. The recent measure to include land revenues in the local government budget, rather than as part of the extrabudgetary funds managed by the land bureau, could improve the governance of these funds and reduce the incentive to pursue a land-intensive development pattern; and

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11. These objectives are quantified by anticipative benchmarks in Special Column 2 of the 11th Five Year Plan.

- policies to help upgrade the production structure and promote the so-called knowledge economy, including well-targeted government support for research and development and improving access to financing (e.g., venture capital) for innovators.

The above policy reforms have been modeled with the DRC's CGE model. The second scenario, with rebalanced policies as discussed above, has more growth coming from services and less from industry (table 3.4). The contribution of the secondary sector to GDP declines by over 10 percentage points through 2035, while that of the service sector increases by 20 percentage points. On the expenditure side, more growth comes from consumption and less from investment and exports. In this scenario, continued rapid growth would require significantly less capital accumulation. However, the rebalanced policies allow for higher TFP growth, with much of the improvement coming from greater reallocation of labor, largely from rural to urban. Thus the scenario has higher TFP growth from reallocation of labor, by about 0.6 to 0.8 percentage points, than the "on past trends" scenario, which is the broadly the same as the difference in nonhuman capital-related TFP growth between the two scenarios. A more employment-friendly setting also allows for somewhat higher overall employment growth: It is assumed that in this scenario employment grows in line with growth in the working-age population. This means that, even though saving and investment are significantly lower in this scenario, GDP growth is the same.<sup>12</sup> As a result, it is more balanced in three aspects.

First, saving and investment decline significantly over time because of policy reform. Saving and investment are significantly lower than in the "on past trends" scenario, with the investment-to-GDP ratio averaging a more sustainable 35 and 32 percent in the periods 2015–25 and 2025–35, respectively, compared with over 44 percent and almost 50 percent in the "on past trends" scenario over the same periods.<sup>13</sup> This lower overall investment-to-GDP ratio is more consistent with prospective long-term trends in demographics and saving. As for sectoral patterns of saving, with policy reforms affecting the industry-services trade-off, dividends, the labor market, and the financial sector, enterprise saving is lower in a less capital-intensive, less industry-based economy.<sup>14</sup> Reforms in health,

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12. However, with a vintage-type capital stock, less new investment means less embodied technological progress. This may be of particular importance for environmental standards.

13. Specifics about the long-term saving and investment projections and the estimated impact of policy reforms are discussed in Kuijs (2006).

14. In the sectorally disaggregated saving-investment projections, we assume that household and government investment are constant as a share of GDP. Much of enterprise investment is saved by the enterprise sector, in line with recent patterns.

**Table 3.4 Growth patterns in two scenarios** (percent)

| Source  | On past trends |         |         |         | With rebalanced policies |         |         |         |
|---|----------------|---------|---------|---------|--------------------------|---------|---------|---------|
|   | 2005–15        | 2015–25 | 2025–35 | 2035–45 | 2005–15                  | 2015–25 | 2025–35 | 2035–45 |
| GDP growth <sup>a</sup>                                   | 8.3            | 6.7     | 5.6     | 4.6     | 8.3                      | 6.7     | 5.6     | 4.6     |
| Total employment growth                                   | 0.1            | -0.5    | -0.9    | -1.1    | 0.5                      | -0.1    | -0.5    | -0.7    |
| Labor productivity growth                                 | 8.1            | 7.2     | 6.6     | 5.7     | 7.7                      | 6.8     | 6.2     | 5.3     |
| From TFP growth   | 2.5            | 2.2     | 1.9     | 1.6     | 3.1                      | 2.8     | 2.5     | 2.2     |
| From higher capital/labor ratio                           | 5.3            | 4.7     | 4.4     | 3.8     | 4.0                      | 3.5     | 3.2     | 2.6     |
| From higher human capital                                 | 0.3            | 0.3     | 0.3     | 0.3     | 0.5                      | 0.4     | 0.4     | 0.4     |
| Investment/GDP ratio (period average, percent)            | 44             | 49      | 55      | 60      | 35                       | 31      | 29      | 26      |
| Share of industry in GDP (end of period)                  | 50             | 50      | 51      | n.a.    | 44                       | 40      | 37      | n.a.    |
| Share of employment in agriculture (end of period)        | 38             | 36      | 33      | n.a.    | 29                       | 18      | 12      | n.a.    |
| Urbanization rate (end of period)                         | 50             | 52      | 55      | n.a.    | 59                       | 68      | 72      | n.a.    |
| Urban-rural income disparity (end of period) <sup>b</sup> | 4.0            | 4.4     | 4.6     | n.a.    | 3.2                      | 2.8     | 2.8     | n.a.    |

n.a. = not applicable

TFP = total factor productivity

a. Potential GDP growth. In 2005–07, actual GDP growth is assumed to differ from potential GDP growth. From 2008 onward, actual growth is assumed to equal potential.

b. 2002 prices.

Sources: National Bureau of Statistics of China; authors' estimates.

education, and the social safety net allow household saving to decline as a share of GDP. In all, the current account surplus gradually declines over time as a share of GDP.

Second, China uses fewer primary commodities and less energy and produces less pollution. This is because it has less industry and, within industry, less heavy and dirty industry, in large part because of better pricing of energy, commodities, and environmental degradation. The difference in structure within these broader sectors is also quite interesting: In the rebalanced scenario, significantly less heavy industry and construction but more education, science, and technology.

Third, the economy creates more urban employment and, as a result, more rural-urban migration, higher rural productivity and incomes, and less urban-rural inequality. Urbanization rises to 72 percent in 2035 compared with about 55 percent on past trends. At the same time, more urbanization stimulates the services industry, including through the spending patterns of urban residents.<sup>15</sup> Combined, these factors mean more urban employment growth and more transfer of labor out of agriculture. The share of employment in agriculture in this scenario falls to 12 percent in 2035.<sup>16</sup> As a result, labor productivity in agriculture rises much faster, supporting higher incomes there. The decrease in the productivity gap between agriculture and the other sectors underlies lower urban-rural income inequality. The ratio of urban over rural per capita income declines to 2.7 in 2035, while the Gini coefficient decreases to 0.38 in 2035.

## Conclusion

China's rapid growth faces macroeconomic, environmental, and social challenges that have their origin in its pattern of growth. Using simulations with a CGE model, this chapter has shown that, on current trends, current account surpluses, environmental stress, and inequality are likely to remain a feature of China's growth. A policy package that reduces savings, better prices capital and environmental damage, and allows for more labor movement is likely to produce better outcomes on all three counts. The exchange rate plays a minor role in this package, and an adjustment would mainly serve to limit expectations for an exchange rate appreciation and accompanying foreign capital inflows.

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15. Urban residents spend 8 percentage points more of their income on services than do rural residents.

16. This may seem fast. However, it is not exceptional compared with experiences in other southeast Asian countries. South Korea witnessed a similar pace, from 50 percent in 1973 to 10 percent in 2001. Malaysia decreased its agricultural employment from 37 percent in 1980 to 18.4 percent in 2001.

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## Comment

# Approaches to Rebalancing China's Growth

KENNETH ROGOFF

China's breathtaking economic growth continues to astonish the world. As Hofman and Kuijs illustrate, China is rapidly moving into a league all its own in the modern annals of growth, equaling and surpassing the peak years of the Korean and Japanese miracles despite being an order of magnitude larger. How long can China's growth be sustained?

The Hofman and Kuijs paper is useful particularly in its first part, in which the authors starkly illustrate the unsustainability of China's current trajectory. Table 3.1, which decomposes Chinese growth into productivity improvements, capital deepening, and labor reallocation, is particularly important. The basic message is that, although productivity growth continues to play a significant role, it accounts for only one-third of China's growth from 1993 to 2005 versus 50 percent from 1978 to 1992. The estimated total factor productivity growth of 2.8 percent for the 1993–2005 period is still quite respectable and probably double that of the likely US rate for the next decade. But considering how far China still lags behind the United States in income today, China will have to sustain ever-higher rates of capital deepening to keep closing the gap at the rapid pace of recent years.

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Another important fact the authors emphasize is the importance of rising enterprise saving in China's phenomenally high saving rate. Household saving, at roughly 25 percent of disposable income, is actually fairly normal in Asia. But the corporate sector has been enjoying phenomenal profits, with wages falling sharply as a share of GDP down to less than 40 percent. Low wages combined with high profit rates are at the heart of China's sharply growing income inequality, perhaps even more so than in the developed world. The authors show that by standard measures (the Gini coefficient), China's income inequality is surpassing that of the United States and heading toward Latin American levels. Income inequality is exacerbated by the very low returns suffered by China's savers in financial markets, despite the country's high rate of growth. Financial repression constitutes an enormous tax on China's poor, who can expect to earn roughly 2.5 percent on their savings accounts in a country growing at 10 to 11 percent per year. That said, most estimates suggest that China's inequality is not yet as extreme as Latin America's though it has surpassed the United States. The environment section of the paper shows that China contains 16 of the world's 20 most-polluted cities but observes that in many cities, objective measures of pollution have not been getting worse. The problem, of course, is that urbanization is sprawling into the countryside, bringing pollution with it.

The paper's presentation of the above facts is excellent. The model-based exercises in the second section of the paper, however, have some interesting ideas but lack sufficient transparency to make them terribly convincing. The authors use a computable general equilibrium (CGE) model, a nomenclature that no longer makes sense; with today's easy access to computer simulation methods, virtually all macroeconomists use them to calibrate their models, so the phrase "computable general equilibrium model" no longer has any meaningful information or distinction. Each model must be judged on its own merits, and unfortunately, the details of the model used here are to be found in other papers.

The first empirical exercise the authors conduct looks to be simply an extrapolation of current trends or something quite similar. It should be thought of as China's trajectory based on unchanged policies. Even assuming a fall in China's growth to 8 percent for the next decade and 7 percent thereafter, China will have to invest 60 percent of its GDP to keep up the pace of growth. Even for China, which has averaged investment of 37 percent of GDP over the past decade, this looks nearly impossible. Decreasing returns to capital eventually have to set in, even with China's still vast unemployed-labor pool. Presumably, such a trajectory would eventually force China to shift from being a net saver to a huge net borrower, not to mention the pollution implications. If this scenario were realized, one piece of good news would be that China's trade balance surplus would likely evaporate. China would need to borrow massively even to maintain

a far more modest level of consumption than it currently enjoys. It might even need to borrow from the International Monetary Fund some day.

The second empirical exercise is supposed to be loosely grounded in an alternative growth strategy that does all sorts of wonderful things, such as “advancing the knowledge economy,” introducing reforms to give local officials better incentives, and fixing the tax system. How the authors manage to calibrate these wonderful things within their modest empirical model is hard to fathom. I do not know what to make of the calibration, although the numbers the authors crank out seem to be much more satisfactory than the extrapolation exercise. The authors talk about better pricing of energy. Does this mean relaxing price controls? This is very hard to handle in any CGE model I know of; it would be interesting to hear more discussion of what was actually done. How the authors can argue that exchange rate adjustment is not important, when their model does not seem to have any meaningful monetary or financial sector, is also unclear.<sup>1</sup>

Turning Hofman and Kuijs’s analysis on its head, one might note that, to dispense with exchange rate adjustment, China needs to perform policy reform miracles on numerous fronts, and fairly quickly given the political obstacles. The exercise is interesting and the authors have earned the right to speculate given their excellent facts section. But the window dressing of their CGE model does not seem to bring any great light beyond the authors’ own expert judgments.

Hofman and Kuijs have written a very useful paper, and I learned a lot from it, but the final section on what China ought to do to make its growth sustainable would be better treated as a speculative flourish rather than a centerpiece.

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1. Applying a model with rational expectations and learning to China, Feltenstein, Rochon, and Shamloo (2007) show that current growth trends lead to excessive foreign direct investment as well as increasing domestic investment. The resulting unanticipated fall in the return to capital causes bank failures, higher interest rates, and yet more bank failures. The investment boom collapses and growth declines. This happens after about nine years in a discrete time simulation. Another approach to the same set of issues, with similar results, is Lipschitz, Rochon, and Verdier (2007).

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## Comment

# Domestic Imbalances and Data Ambiguities

BARRY BOSWORTH

Bert Hofman and Louis Kuijs's paper summarizes recent research at the World Bank on the economic imbalances that have emerged in China in recent years and simulations of potential policy responses. The imbalances are very evident on the external side in the form of a rapidly rising current account surplus, which is likely to reach 12 percent of GDP in 2007 and even higher in 2008. However, the imbalances are also evident in the domestic economy in the form of a rapidly growing gap between domestic saving and investment. World Bank researchers have contributed significantly to efforts to measure the extent of the saving-investment imbalance within China as a counterpart to the more obvious worsening of the country's external imbalance.

Two major themes emerge from the paper. First, as foreigners have focused on China's large external surplus, less attention has been paid to the large domestic surplus of saving over investment that Hofman and Kuijs argue is the driving force behind the trade imbalances. The authors assert that the aggregate saving surplus is due largely to rapid increases in enterprise saving and that the shares of household and government saving in income have been stable or declining in recent years. Second, the solution to the imbalance is a series of reforms aimed at stimulating domestic

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demand. The authors outline a package of policy reforms and provide some results from a simulation model.

To begin, I would like to emphasize both how recent the emergence of the imbalances has been and how unexpected their magnitudes are. Despite the common characterization of China as an example of export-led growth, exports were a stable or declining share of GDP between the adoption of the fixed exchange rate in 1994 and World Trade Organization (WTO) membership at the end of 2001, and current account surpluses were consistently small, seldom exceeding 2 percent of GDP. Predictably, China's export and import growth both accelerated after joining the WTO, but again there was little change in the current account balance. The external imbalance emerged only after 2005, when exports continued to grow rapidly while imports slowed and stabilized as a share of GDP. This is particularly surprising in that we can identify no significant change in the exchange rate that would account for this pattern. On a trade-weighted basis, China's real exchange rate has remained relatively constant or even appreciated slightly, while the dollar has experienced significant depreciation. The explanation for the break in the correlation of the two countries' exchange rates is that China's trade is oriented toward Asia while the United States has a larger trade relationship with countries outside of the region, for which the decline in the dollar's value has been most dramatic. Some commentators question the continued surge of China's exports, arguing that it might reflect overinvoicing as enterprises use the trade channel to move funds into China in anticipation of revaluation. Others focus on the slowing of import growth, suggesting that it results from an emphasis on import substitution from surging domestic production capacity in the areas of capital goods and basic metals.

The changes in the domestic saving-investment balance raise equivalent questions. Apparently, national saving has suddenly come to exceed domestic investment by a stunning 12 percent of GDP. Many have noted the small role of consumption growth in domestic demand, but without good data we are unsure of the reason. The authors' emphasis on enterprise saving suggests that a significant part of the problem is that only a small portion of the growth in aggregate income is being passed through to households. This contrasts with the more common explanation that, without a social safety net, households save an unusually large portion of their income because of fears of illness or old age. Rather than focusing only on creating a Western-style social safety net, the authors also propose a set of measures designed to force the enterprises to pay out a larger portion of their profits. There are conflicting estimates of the appropriate distribution of Chinese saving between enterprises and households, yet the issues would seem fundamental to adopting appropriate remedial measures.<sup>1</sup>

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1. See a recent paper by Marcos Chamon and Eswar Prasad (2007) for a contrary perspective on the relative roles of enterprises and households.

The emphasis on enterprise saving suggests a possible role for foreign invested enterprises, the exports and profits of which have increased rapidly in recent years. With expectations of exchange rate appreciation, they have a strong incentive to retain their profits in renminbi. Finally, it is very difficult to fully integrate the evidence of external and internal imbalances because of a very large statistical discrepancy in the accounting relations among saving, investment, and the current account.

It is easy for foreigners to focus on the exchange rate as a central feature of an expenditure-switching policy to reduce the imbalances, but China must also be concerned about adjustments on the domestic side, given the risk that exchange rate changes alone could precipitate a recession. A considerable degree of uncertainty and conflicting interpretations of the data remain, yet recent changes have left China with an unusual degree of exposure to developments in both the United States and the global economy. The authors draw greater attention to the domestic side of the imbalance and need for policies to stimulate domestic demand. However, if the origins of the problem are on the domestic side, I am surprised at the speed with which they have spilled over into the external sector with no slowing of domestic economic activity.

Finally, as a background to their rebalancing scenario, the authors use a growth-accounting framework to assess the opportunities for sustained growth in future years. Their view is that GDP growth will continue at a high rate over the next two decades, averaging 7 to 8 percent annually, compared with a rate just short of 10 percent from 1993 to 2005 (I prefer to ignore the projections to 2035). While China still has a large reserve of underemployed labor and much room for a continued pattern of productivity catch-up, the projection is inconsistent with past patterns, in which the growth of high-performing economies inevitably slowed over time. However, China has already become a truly exceptional case, and there is no firm basis other than probability for predicting a significant slowdown. Certainly, I would argue that one can discern no significant evidence of an impending slowdown in the available data. Instead, the greatest threat to China's future growth is the imbalances, both internal and external, that have developed since 2005. China is now exposed to and dependent upon continued expansion of the global economy in ways that it was not in the past. This may not bode well for China, as it appears the long-predicted correction of the US external deficit and overvalued dollar has now begun.

Hofman and Kuijs contribute to the literature in directing attention to the domestic side of the economic imbalances that have developed within China's economy since 2005. The global discussion of China's role in the global economy has often focused too narrowly on exchange rate issues. It is unfortunate, however, that the ambiguities of the data have left us so un-

certain about the causes of the growing gap between domestic demand and supply. The suddenness of its emergence and its size are disconcerting.

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