***PRELIMINARY. NOT FOR QUOTATION***

# *Rebalancing China's Growth*

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***Abstract***

China's rapid growth is facing macroeconomic, environmental and social challenges that have their origin in its pattern of growth. Using simulations with a CGE model this paper suggests that on current trends, current account surpluses, environmental stress and inequality are likely to remain a feature of China's growth. Alternative simulations if 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 the accompanying foreign capital inflows.

[1] World Bank. This paper draws on World Bank (2007) and He and Kuijs (2007), reflects the authors' personal opinions and should not be attributed to the organizations they work for, or to the executive directors or member countries of the World Bank.

## 1 Introduction

Sustainability of China's growth has moved center stage**.** After three decades of exceptionally rapid growth, the sustainability of growth in terms of environment, social stability, and even GDP growth itself is being widely debated. The "Harmonious Society" that has become the proclaimed goals of the country leadership is aiming for more equitable, environmentally sustainable growth. Indeed, the "quality of growth" and the "efficiency of growth" are now as important as the speed of growth.[2] This paper argues that more sustainable growth will require more 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. This paper reviews China's growth experience over the past thirty years, identifies key imbalances in China's growth pattern, and provides two policy scenario's for China's future—one illustrating the consequences of continued growth along past trends, and one spelling out the implications of a set of policies that would rebalance the economy in the direction of meeting the goals of the Harmonious Society.

## 2. China's past growth performance

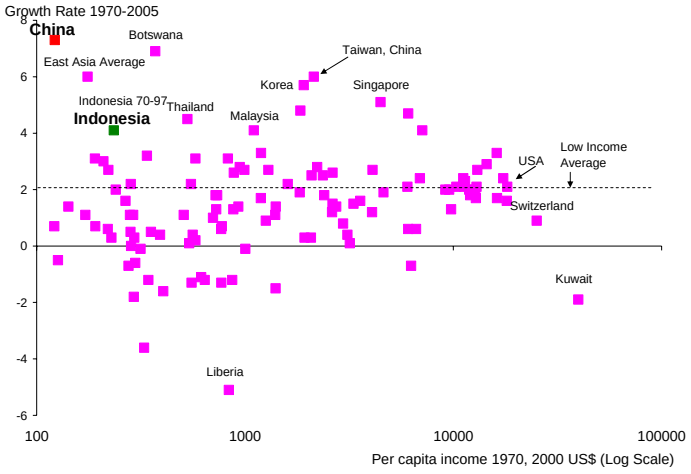
China's rapid growth has been one of the most remarkable development experiences of our times. A country that was among the poorest in the world three decades ago with only $175 per capita income in 1978 (measured in 2000 dollars) is now a thriving middle income country with a per capita income of more than $2000, and one that is growing with more than 10 percent per year. China's remarkable success has sparked widespread interest among academics and policymakers alike, has challenged in many ways the conventional wisdom among economists, and has even given rise to suggestions of a "Beijing Consensus" new development paradigm, in contrast to the "Washington Consensus" prescription that some observers see as the standard prescription for developing countries' reforms.

China's growth over the last 30 years is indeed in a league of its own. Since reforms of the centrally planned economy started in 1978, China has managed to eightfold its GDP per capita, with annual GDP growth averaging more than 9.5 percent. China's growth is truly exceptional: of the 119 countries for which data are available from 1970, China ranks first in terms of growth in GDP per capita (Figure 1), and only small, diamond-rich Botswana comes near—although Korea and Taiwan (China) experienced almost similar growth rates in the 25-year period after the early 1960s. China has had consistently high growth in every decade of reforms since 1978, despite significant slowdowns in 1981, 1989 and 1990; these years were followed by accelerated growth that quickly recovered lost ground.

***Figure 1: China in a league of its own***

[2] Premier Wen Jiabao in his Report on the Work of Government to the 2007 NPC announced that China would more from rapid and efficient growth to efficient and rapid growth, emphasizing the "efficient" growth part..

China's rapid growth has lifted hundreds of millions of people out of poverty. The poverty rate at $1/day PPP consumption fell from over 60% of the population in the early 1980s to 10.3% in 2004 (Ravaillion and Chen 2004; World Bank 2006a), although the early numbers probably overstate poverty because of deflator problems, while the existing official PPP conversion factor probably leads to an underestimation of poverty in recent years. Nevertheless, on that count, growth since reform take-off in 1978 has lifted some 500 million people out of poverty. Deflator adjustments may qualify this number, but there is little doubt about the bottom line conclusion that poverty has been reduced by hundreds of millions of people. Not everyone has benefited equally from growth, though, and income inequality has been rising after an initial decline in the early years of reform that focused on rural reforms. China's Gini coefficient increased from 0.25 in the mid-1980s to more than 0.45 now.



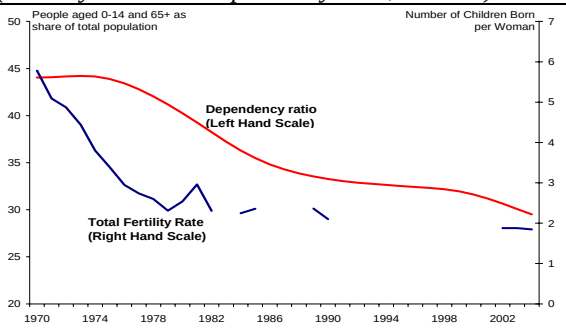

*Source:* WDI 2006

By using a growth accounting framework, China's growth can be decomposed in contributions of employment growth, capital, human capital and productivity growth (TFP) (Table 1). Numerous studies have done so, and Heytens and Zebregs (2003) summarize earlier studies, which include Chow (1993), Hu and Khan (1997), and Wang and Yao (2002). More recently, Bosworth and Collins (2007) compared growth of China and India in a growth accounting detailed framework. Although estimates differ because of variations in assumptions, the studies largely agree on several findings. TFP growth has contributed significantly to GDP growth, having increased since the introduction of reforms at the end of the 1970s. Estimates of TFP growth during the reform period range "between 2 and 4 percent per year" (Heytens and Zebregs 2003). These studies find that the contribution of capital accumulation is high and rising. Notwithstanding respectable productivity growth, the contribution of physical capital accumulation has been large and growing, reflecting the high and increasing investment to GDP ratio. He and Kuijs (2007), equally find that the contribution of capital accumulation to GDP growth is significantly larger in 1993-2005 than in 1978-1993, reflecting the rapid investment growth over the last decade, while TFP growth declined with respect to the first period, and its contribution to GDP per employee dropped from almost 50 percent in 1978-93 to

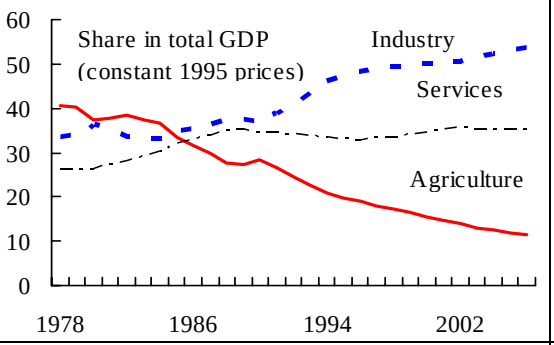
## *Figure 2: China's Growth Experience*

### *High Savings and Investment*
*(Savings and Investment as a share of GDP)*

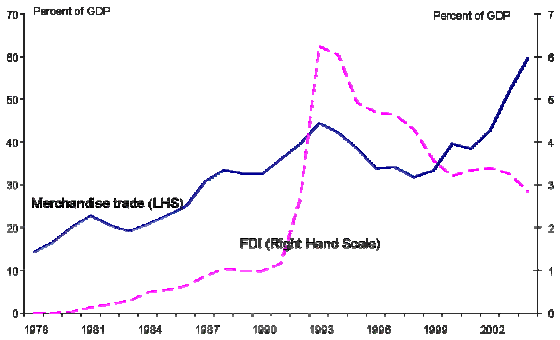

### *Favorable Demographics*
*(Fertility Rate and Dependency Rate, Percent)*



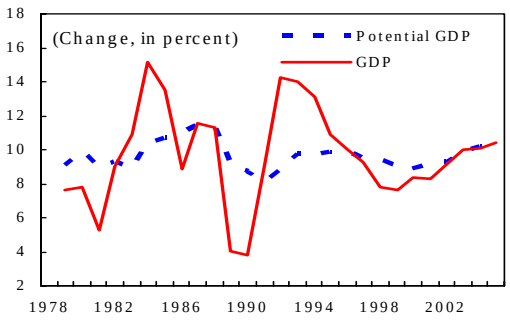

### *Structural Change*
*(Sectoral Composition of GDP, Percent)*



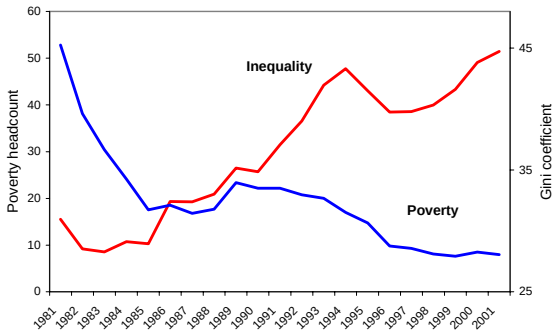

### *A Great Leap Outward*
*(Trade, Foreign Direct Investment, Percent of GDP)*




### *Growing in leaps and bounds*
*(Growth in Potential and Actual GDP, Percent)*




### *Declining Poverty, but Rising Inequality*
*(Poverty headcount ratio and Gini Coefficient)*




*Sources:* Hofman et al, 2007; Ravaillion and Chen, 2005; World Bank Quarterly Updates, World Bank 2007.

Table 1.Explaining China's growth (1978-2005) *
(average annual increase, in percent)

| | 1978-93 | 1993-2005 |
|---|---|---|
| GDP growth | 9.7 | 9.6 |
| 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 b/t sectors | 1.3 | 1.1 |
| From increasing H/L | 0.5 | 0.2 |
| From increasing K/L ratio | 3.2 | 5.3 |
| Memorandum items (in percent) | | |
| Investment/GDP ratio (period average) | 29.9 | 36.8 |

Source:He and Kuijs 2007.

* 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; Hu and Khan, 1997), 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 Table 1 further separates out an estimate of the contribution of human capital accumulation, using Barro and Lee data and an assumption of the rate of return to education of 10 percent.

about a third in 1993-2005. On most assumptions, TFP growth is estimated to have declined over time. On the "consensus" assumptions behind Table 1, TFP growth is estimated to have declined over time. In contrast, Bosworth and Collins found that TFP growth was higher in 1993-2004 than in 1978-1993.[3] The contribution of capital accumulation to labor productivity growth increased to 5.3 percentage point in 1993-2005. This is very high compared to other countries. High capital accumulation explains more than 2/3rds of the difference in labor productivity growth between China and other countries/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 a fairly high level of human capital (measured as number of years of schooling in the working population) already, but progress since has been unremarkable. The recent sharp increase in tertiary school attendance is likely to change that in the future.

China's growth experience is closely tied in with its reform process. The country's gradual reforms process maintained a level of macroeconomic and social stability that allowed savings and investment to remain high, while gradual reforms in the planning system, price, and ownership allowed the mobilized resources to be allocated increasingly more efficiently, which is reflected in higher TFP. China opened up its economy, changing from a virtually closed economy to one where trade (exports plus imports) makes up more than 60 percent of GDP, which is exceptionally high for a country the size of China. Foreign direct investment played less of a role in terms of GDP, but China has since the mid-1990s been the largest recipient of FDI in the developing world. Foreign invested enterprises also explain a big part of China's export

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

success, and more than 60 percent of exports are done by them. In contrast to FDI, the rest of the capital account remained virtually closed throughout the reforms, and only recently has China allowed limited portfolio flows in and out of the country. Structural change shifted the economy—and employment—from low productivity agriculture to high productivity industry and services. And the economy transformed from one dominated by State Owned Enterprises (SOEs) and collective farms, to one dominated by non-state enterprises of all kinds of denomination (private, collective enterprises, township and village enterprises, foreign invested enterprises). Macroeconomic management was a challenge throughout the reform period, and repeatedly bouts of reforms ran into problems of overheating and high inflation. High by Chinese standards, that is, because even at the peak of the 1993-4 inflation, this never exceeded [20] percent year on year. But for a government that was concerned about social stability, and with the hyperinflation of the latter days of the Guomindang government of the late 1940s etched in the collective memory, this was considered as far too high.

***Table 2: Major Reform Steps in China 1978-2005***

| *Year* | *Reform Step* |
|---|---|
| 1978 | *Communiqué"* of the third central party Committee (CPC) plenum of the 11th party congress initiating "four modernizations" |
| 1979 | "Open door" policy initiated, foreign trade and investment reforms begin. Law on Joint Venture Companies passed. |
| 1979 | Limited official encouragement of household responsibility system |
| 1979 | Three specialized banks separated from the People's Bank (the central bank). |
| 1980 | First 4 special economic zones created |
| 1980 | "Eating from Separate Kitchens" reforms in intergovernmental fiscal relations |
| 1984 | Individual enterprises with less than 8 employees officially allowed |
| 1984 | Tax for Profit reforms of SOEs |
| 1986 | Provisional bankruptcy law passed for SOEs |
| 1987 | Contract responsibility system introduced in SOEs |
| 1989 | Tiananmen square events trigger retrenchment policy, halt on reforms |
| 1990 | Stock exchange started in Shenzhen, Shanghai |
| 1992 | Deng Xiaoping's "Tour through the South" reignites reforms |
| 1993 | Decision of the third plenum of the 14th party congress to establish a "socialist market economy" paving way for fiscal, financial, SOE reforms |
| 1994 | RMB convertible for current account transactions |
| 1994 | Tax Sharing System Reforms introduced, |
| 1994 | Policy banks established, commercialization of banking system announced |
| 1995 | Central Bank Law, Banking Law, Budget Law enacted |
| 1997 | Comprehensive plan to restructure SOEs adopted, "grab the big, let go of the small" |
| 2001 | China's accession to WTO |
| 2003 | 3rd CPC plenum of the 16th party congress, decision to "perfect" the socialist market economy |
| 2004 | Constitution amended to guarantee private property rights |
| 2005 | Construction Bank, Bank of China Initial Public Offerings |
| 2006 | 6th CPC plenum of the 16th party congress establishes the goal of "Harmonious Society" |

*Source*: Hofman et. al. 2007

## 3. China's unbalanced growth

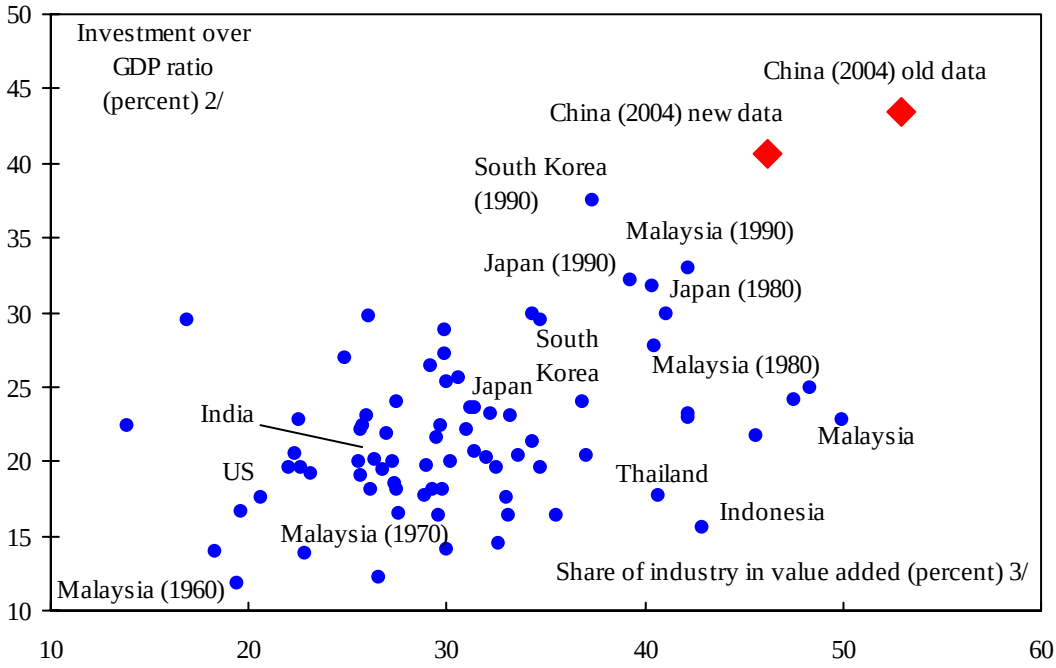
China's record growth performance has come at a price. The current growth pattern relies heavily on manufacturing industry, investment and external demand. The accompanying large and growing current account surpluses have become an issue in the international arena, whereas domestically, the accumulation of international foreign exchange reserves is not only becoming increasingly a macroeconomic issue, it also signifies a sub-optimal allocation of resources form China's point of view. Further,

reliance on manufacturing industry, notably heavy industry, has become a growing burden for China's environment and has made the country increasingly dependent on imported energy resources. Finally, China's rapid growth has been associated with rising income inequality, which has become a key issue in the political debate. 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*

Per definition, the current account surplus of a country equals the surplus of savings over investment. China's traditionally high savings rates have risen even further over the recent decade (Table 3). Although investment rose along with higher savings, investment rose less fast, and as a result, China's current account surplus has boomed. Contrary to popular thinking, the increase in savings did not come from households: although household savings at some 25 percent of disposable income is high, it is not higher than that of other rapidly growing Asian countries. The bulk of the increase in savings has come from enterprises. Enterprise

Figure 3. Industry and investment go together.




savings, which equals enterprise retained earnings and depreciation charges, has boomed in the last decade. There are several reasons for this boom in profits: first, in the wake of the Asian crisis, China embarked in earnest on State Enterprise (SOE) Reforms. Restructuring of existing enterprises, retrenchment of the workforce, and separation of social functions such as health, education and pensions from the operation of the SOEs all have boosted profitability. As a result, whereas SOEs were on aggregate hardly profitable in the mid-1990s, and loss-making enterprises were a drain on the budget,

Table 3: Saving, Investment, and the current account in China

| | (% of GDP) | | | | |
|---|---|---|---|---|---|
| | 1996 | 2000 | 2002 | 2004 | 2006 |
| Gross domestic saving 1/ | 40.6 | 36.8 | 37.6 | 43.0 | 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 + net transfers | -1.2 | -0.7 | -0.1 | 1.0 | 1.0 |
| GNS (above the line) | 39.5 | 36.1 | 37.4 | 44.0 | 51.6 |
| discrepancy | 1.8 | 0.7 | 2.9 | 2.8 | 2.8 |
| GNS (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 |

Source: NBS data and authors' estimates

today they make aggregate profits of some [1trillion] or 3 percent of GDP. Second, rapid entry of foreign and private firms since the mid-1990s meant that the non-state sector took up a rapidly rising share of the economy. While numbers for the whole economy are not available, numbers for industry show that foreign and private enterprises increased their share of industrial production from 31 percent in 1995 to 72 percent in 2003. Dollar and Wei (2006) using a 2004 sample of 12,000 industrial enterprises have shown that have shown that the return on capital of private and foreign enterprises is three times that of SOEs, so the shift in production to non-SOEs has increased the profitability of the economy. Third, China's WTO entry in 2001, achieved after long and tough negotiations, removed many of the remaining domestic and distortions that suppressed profits. Moreover, China's entry made the country a credible host for final assembly of production because the country had tied its hands regarding import tariffs. This triggered an investment boom, particularly in export oriented sectors. Fourth, enterprise savings are high because most profits are retained rather than paid out in dividends. This holds particularly true for SOE savings, which, by policy decision made after the 1994 tax reforms, were allowed to retain all their earnings. But private enterprises, keen to finance their expansion in China, display high retained earnings as well.

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**.** The 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 been increasing in line with actual GDP growth to over 10 percent per year. This means that the economy can grow rapidly without running into the kinds of problems that emerging markets often run into, such as high inflation, large current account deficits, and bottlenecks in the real economy.

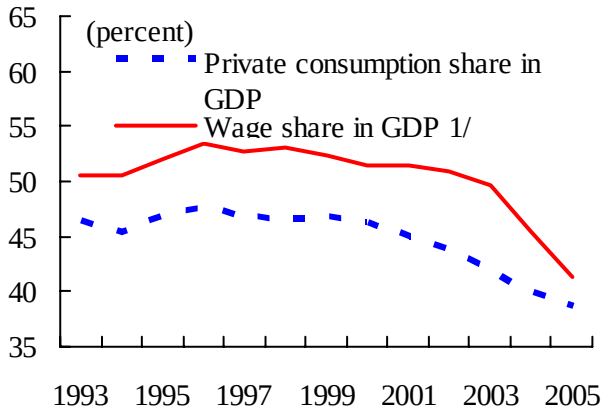
At the same time, there are macroeconomic downsides to this growth pattern. The first macroeconomic downside is that it may not be possible to finance the current capital-intensive mode of growth in the long run. Over time, more of growth has come from

capital accumulation, and less from employment and TFP growth. If China would continue with rapid growth in the current mode of growth, the rates of saving and investment would need to increase to 50-60 percent of GDP in the decades ahead (see Table 4 below), which would be difficult to finance given pressures for saving to fall, including from demographics. Moreover, investment as such does not contribute to people's standard of living.

A further 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, 6/7th 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 to value added growth of 11.2 percent.

Finally, and most central to the US debate on China, a significant part of the growth in China stems from increasing production of manufacturing goods, with a tendency for increasing current account surpluses. While demand and supply in China's economy are growing broadly in line with each other, a significant share of the demand is coming from abroad, instead of Chinese households and businesses. Under the investment-heavy, business-friendly pattern of growth, production in China increasingly outstrips domestic demand. From the external perspective, accelerating manufacturing production means continued strong export expansion, whereas import growth has been more subdued, in part because of increasing import substitution. As a result, the current account surplus is rising steadily. Having reached 9.5 percent of GDP in 2006, the current account surplus has become the key source of China's impressive balance of payment 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, is keeping domestic interest rates low, and has started to feed a rapid increase in asset prices. Moreover, a large difference between production and domestic demand in a large country like China can contribute to global imbalances and trigger trade tension. In terms of the distribution of income, the flipside of the increase in enterprise income and buoyant tax revenues is that wage income, and household income in general, has declined as a share of GDP. The wage share declined from 53 percent in 1998 to 41.4 percent in 2005 (Figure 4) (see World Bank, 2007 pp 6-7 for more detail). The declining role of wages

Figure 4. Consumption and wage share in the economy has declined



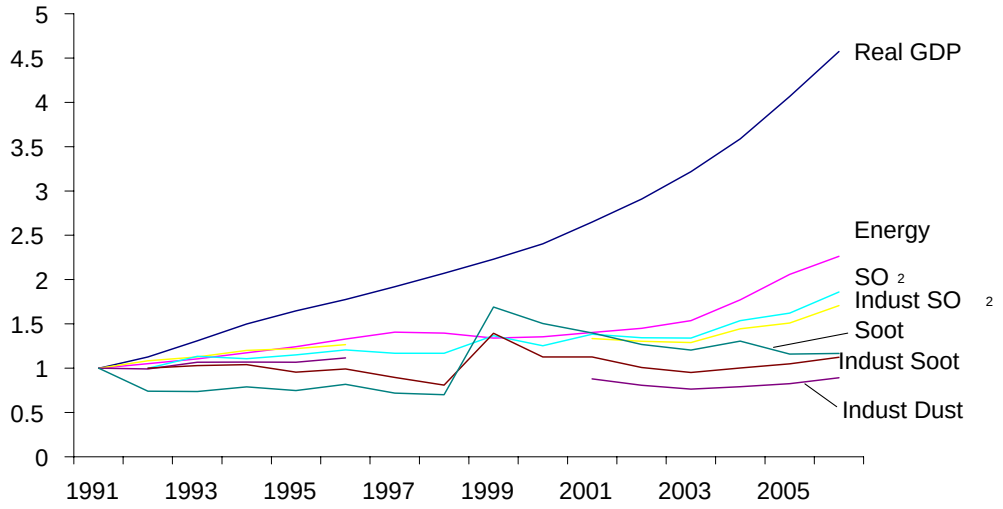

Source: National Bureau of Statistics.
1/ From Statistical Yearbook.

and household income in the economy are the key reason behind the declining share of consumption in GDP since the late 1990s. Aziz and Cui (2007) find that a decline in households' investment income, largely because of declining interest rates, has amplified the reduction of the share of household income in GDP.

*Environmental Strains*

China's heavy reliance on industry for growth has put increasing strains on the environment. China has dramatically improved the efficiency of use of natural resources and energy over the past 30 years, and has affectively delinked environmental impact from its growth (Figure 5). Also, the World Bank's comprehensive indicator of sustainable growth, the so-called "genuine savings" indicator, which corrects gross domestic savings for environmental deterioration, natural resource use and investment in human capital also shows improvements since the early 1980s (World Bank 2006). Nevertheless, environmental constraints on growth now loom large.

**Figure 5: China has de-linked economic growth from energy use and pollution and**
Indexed trends in real GDP, energy consumption, and main pollutant emissions (1990-2005, 1990=1)




*Source:* Chapter 4.

- The energy intensity (energy use per unit of output) is some four-six times that of advanced countries if measured in current dollars. China's high share of industry in the economy, which is 4 to 4 times higher than those advanced countries is a major explanation for this discrepancy, but even at industry level it is still some 1.5 to 2 times higher than in advanced economies.[4] The changing pattern in energy use is resulting in steeply rising consumption of fuels and increasing imports of petroleum, and with it a rising concern on energy security.[5] Reliance on coal for 71 percent of the total energy consumed and the rapid spread of motorization is intensifying air pollution and is contributing to greenhouse gas emissions.

- Although the average pollution index for China's cities has been improving over the last decade, poor air quality is still a very visible issue in China, and a costly one, especially in large cities: China has 16 out of the 20 most air polluted cities in the world and according to the State Environmental Protection Agency (SEPA), two thirds of the urban population breathes air of substandard quality. Particle matter, $SO_2$, $NO_x$ and other pollutants are, according to the WHO, the cause of 250,000 premature deaths a year and a recent study by the State Environmental Protection Agency and the World Bank (World Bank 2007b) estimated that the health costs of air pollution amount to 3.8% 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.

[4] If measured in PPP in contrast, China uses as much energy per output as the United States.
[5] See the World Bank/ESMAP forthcoming Energy Strategy Study.

- 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 less than one sixth of the average in the north of the China, the country's main grain producing area. At the same time, the efficiency of water usage is low: it took China 537 cubic meter of water to produce 10,000 RMB of output, four times the world average. China uses 103 cu. meters of water to produce RMB 10,000 in GDP, whereas the U.S. and Japan use only 8 and 6 cu. meters respectively. In individual industries, water usage is 5-10 times that of advanced countries, while the use of recycled water in industry reached barely 50 percent, compared to 75-80 percent in advanced economies.

Thus, despite China's remarkable progress, there is still a long way to go to make Chin'a growth more environmentally sustainable. Also, the route ahead is likely to be more difficult as the relatively easy gains that were achieved by moving away from the inefficiencies of the central planning have been realized already. Arguably, as China grows richer, the demand for higher environmental standards is also growing, but balancing the apparently conflicting goals of growth and environment has proven to be difficult.

China's environmental issues have also a global dimension: the IEA estimates that the country will become the largest greenhouse gas emitter in the world by the end of the decade, and some say the country already is. China on the other hand, argues that much of the pollution and energy is done for manufacturing exports, and our preliminary estimates based on the 2002 Input-Output tables show that some 28 percent of energy used in China is in the end embedded in exports (World Bank 2007). Moreover, China argues, developed countries have been polluting the world for much longer than China, and it is only catching up. Indeed, if one were to take the cumulative emission of C)2 over the last half century—the time it takes for CO2 to disintegrate naturally, China is, with 1/3$^{rd}$ of the cumulative emissions of the United States, and 1/6$^{th}$ of that of OECD countries, only beginning to catch up.[6]

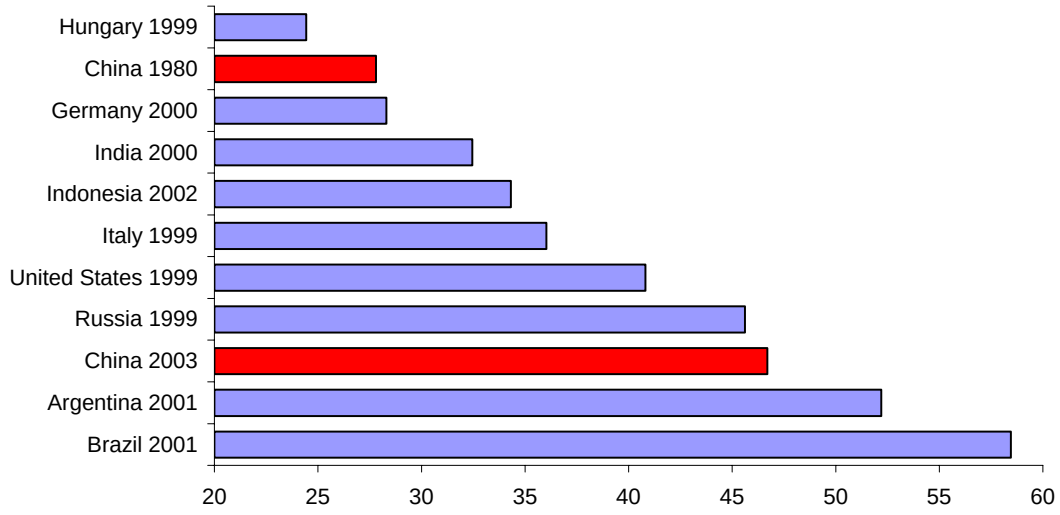
*Rising Income Inequality.*

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. China, with an estimated Gini coefficient of more than 0.45 is now less equal than the United States and Russia, and on current trends would be more like Latin American countries in terms of income inequality. Complementary to this, the heavy investment in manufacturing created jobs for only a limited amount of people, and urbanization and decline in low productivity agricultural unemployment has been less than one would expect based on China's growth and level of income.

[6] Data are from WDI 2007, plus authors' estimates.

The sharp rise in China's inequality is partly due to the country's rapid transformation that compressed Arthur Lewis's process of modernization and rising inequality into a few decades. Changes in measured inequality were in part due because in kind benefits under the planned economy—better housing, access to cars and domestic personnel—were monetized under the market economy. But rising inequality also resulted from the country's development strategy: China's coastal development strategy increased interprovincial inequalities, whereas the country's household registration system hampered rural citizens to compete for higher-paid urban jobs.[7] And China's heavy reliance on investment and manufacturing meant that urban formal sector jobs became rapidly more productive, and wages rose in line. As a result, agricultural incomes increasingly lagged average income per capita, contributing to inequality. China's agriculture value added in 2002 was about 1/3 of GDP per capita, whereas the same number for Indonesia was 0.65. More recently, intra-urban and intra-rural inequality has been on the rise as well.

***Figure 6: Growing income inequality***




Source: WDI 2006

**The future consequences of the current growth pattern.**

On current trends, China three imbalances—investment and industry driven growth, environmental strains, and income inequality—are likely to become worse. To illustrate this, we develop a growth scenario that broadly incorporates the features of past growth, and extrapolates this into the future until the year 2035. The scenario is developed with

[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 grain distribution was only available in a citizen's locality of registration.

the use of the CGE model for the Chinese economy from the Development Research Center.[8]

In the *past trend* scenario growth remains largely investment-led and driven by industry. Thus, it has high saving and high investment, with corporate saving playing an important role while household saving also remains high (Table 4). Patterns of employment growth and total factor productivity (TFP) are expected to continue as they have been in the recent decades. That is, employment would grow somewhat slower than the working age population and TFP would edge down over time. This scenario is calibrated as follows. Employment is projected using demographic projections. Using our 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 in 2005-15 and under 7 percent in 2015-25.

***Table 4: Growth Patterns on Past Trends***

| | | On past trends | | | |
|---|---|---|---|---|---|
| | 1993-2005 | 2005-15 | 2015-2025 | 2025-35 | 2035-45 |
| GDP growth 1/ | 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 K/L | 5.3 | 5.3 | 4.7 | 4.4 | 3.8 |
| From higher human K/L | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 |
| Investment/GDP ratio (period av.) | 37 | 44 | 49 | 55 | 60 |
| Share industry in GDP (eop) | 49 | 50 | 50 | 51 | … |
| Share employment in agriculture (eop) | 45 | 38 | 36 | 33 | … |
| Urbanization rate (eop) | 43 | 50 | 52 | 55 | … |
| Urban-rural income disparity (eop) 2/ | 3.8 | 4.0 | 4.4 | 4.6 | … |

Source: NBS (2005), and staff estimates.
1/ Potential GDP growth. In 2005-07, actual GDP growth is assumed to differ from potential GDP growth. From 2008 onwards, actual growth is assumed to equal potential.
2/ 2002 prices.

The DRC's GE model suggest that with a policy setting "on past trends", the share of industry in GDP ("secondary industry") would increase another 3.5 pp between 2005 and 2035. The share of services ("tertiary industry") would also increase (by around 5.5 percentage point) in this period, but the tertiary sector would remain smaller than the secondary sector through 2035. The calibration mentioned above would require an investment-to-GDP ratio of almost 50 percent on average in 2015-25 and more later. We assume that in this "on past trends" scenario, 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, 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.[9] With

[8] For a detailed description of the model see He and Kuijs, 2007.
[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.

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 this industry-led scenario, the energy and resource intensity would continue to be high, and pollution and emission would continue to rise rapidly. Limited urban job creation would further accentuate urban-rural income disparity and overall inequality. This scenario would continue to 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 employed in agriculture, a high share for a country with a per capita income of $10,000 at that time (in 2000 international prices). Consequently, urbanization would continue, but at a modest rate, to around 55 percent in 2035. The productivity gap between agriculture and the rest of the economy would rise from an already high 6 times to over 8 times by 2025, and 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 to 3.8 in 2006.[10] Income inequality as measured by the Gini coefficient would rise further from 0.46 in 2005 to 0.48 in 2035.

Clearly, continuing with the traditional pattern will become increasingly difficult, economically, environmentally, socially, and internationally. The 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 more sustainable economic growth. A host of measures and policies to achieve this has 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 question is whether this is feasible, and whether government has the tools to turn around the current growth trends. China's past attempts to change the pattern of growth, 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 between the emerging objectives of growth, environmental sustainability, and equity.

**An alternative growth strategy for China.**

Rebalancing the economy and striving to a harmonious society have now firmly become key economic policy objectives. The government's 2007 work programs presented at the National People's Congress in March indicated that, while rapid economic growth remains important, the government aims to improve the quality of economic growth, rebalance the growth pattern, and strive to a harmonious society. The government would like to move to growth that is less intensive in resources and capital, cleaner, more knowledge-driven, and more equally distributed. On the macroeconomic side, the

[10] Urban rural real income disparity is lower than productivity disparity because of factors including non-agriculture income of rural people.

government would like to change the composition of demand, relying more on consumption and less on exports and investment, and to reduce the external surplus.[11]

**Broadly, 5 types of policies would help rebalancing.** In many of these areas, policy plans and/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 segments of the population. The types of policies we use to illustrate a rebalancing scenario are:

- First, several macroeconomic measures—largely fiscal—to stimulate domestic consumption, reduce saving, and stimulate the services sector:

- Second, several price and tax measures would help rebalancing by readjusting the relative attractiveness of manufacturing production (tradables) over producing services (non tradables):

- Third, further relax restrictions on the movement of labor and land transactions to facilitate rural-urban migration and mitigate rural poverty. Further, the fiscal system could be improved to provide host cities with more incentives to deliver social services to incoming migrants.

- Fourth, introduce institutional reforms that 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.

- Fifth, introduce policies to help upgrade the production structure and promote the "knowledge economy", including well-targeted government support for R&D and improving access to financing ("venture capital") for innovators.

These policy reforms have been modeled with the DRC's GE model**.** The second scenario, *with rebalanced policies* as discussed above**,** has more growth coming from services, and less from industry (Table 5). The contribution of the secondary sector to GDP declines by over 10 percentage points through to 2035, while that of the service sector increases by 20 percentage point. On the expenditure side, more growth comes from consumption, and less from investment and exports. In this scenario, continued rapid growth will require significantly less capital accumulation. However, the rebalanced policies allow for higher TFP growth, with much of the improvement coming from more reallocation of labor, largely from rural to urban. Thus, this scenario has about 0.6-0.8 percentage point more TFP growth from reallocation of labor than the "on past trends" scenario, which is the broadly the same as the difference in (non-human capital related) TFP growth between the 2 scenarios. A more employment-friendly setting also

[11] These objectives are quantified by "anticipative" benchmarks in "Special Column 2" of the 11th 5 year plan.

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.[12] As a result, it shows more balance in the following dimensions:

***Table 5: Growth Patterns in two scenario's***

| | On past trends | | | | With rebalanced policies | | | |
|---|---|---|---|---|---|---|---|---|
| | 2005-15 | 2015-25 | 2025-35 | 2035-45 | 2005-15 | 2015-25 | 2025-35 | 2035-45 |
| GDP growth 1/ | 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 K/L | 5.3 | 4.7 | 4.4 | 3.8 | 4.0 | 3.5 | 3.2 | 2.6 |
| From higher human K/L | 0.3 | 0.3 | 0.3 | 0.3 | 0.5 | 0.4 | 0.4 | 0.4 |
| Investment/GDP ratio (period av.) | 44 | 49 | 55 | 60 | 35 | 31 | 29 | 26 |
| Share industry in GDP (eop) | 50 | 50 | 51 | … | 44 | 40 | 37 | … |
| Share emp.mnt in agriculture (eop) | 38 | 36 | 33 | … | 29 | 18 | 12 | … |
| Urbanization rate (eop) | 50 | 52 | 55 | … | 59 | 68 | 72 | … |
| Urb.-rur. income ratio (eop) 2/ | 4.0 | 4.4 | 4.6 | … | 3.2 | 2.8 | 2.8 | … |

Source: NBS (2005), and staff estimates.
1/ Potential GDP growth. In 2005-07, actual GDP growth is assumed to differ from potential GDP growth. From 2008 onwards, actual growth is assumed to equal potential.
2/ 2002 prices.

First, saving and investment would decline significantly over time because of policy reform. Saving and investment would be significantly lower than in the "on past trends" scenario, with the investment-to-GDP ratio averaging a more sustainable 35 percent and 32 percent in 2015-25 and 2025-35, respectively, compared to over 44 percent and almost 50 percent in the "on past trends" scenario.[13] This lower overall investment-to-GDP ratio would be more consistent with prospective long-term trends in demographics and saving. As to sectoral patterns of saving, with policy reforms in the areas of the industry/services trade-off, dividends, labor market, and the financial sector, there would be lower enterprise saving in a less capital intensive, less industry-based economy.[14] Reforms in health, education, and the social safety net would allow household saving to decline as a share of GDP. In all, the current account surplus would gradually decline over time, as a share of GDP.

Second, in this scenario China uses less primary commodities and 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

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

also quite interesting, with in the rebalanced scenario significantly less heavy industry and construction, but more education, science, and technology.

Third, in this scenario 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 would rise to 72 percent in 2035, compared to about 55 percent on past trends. At the same time, more urbanization stimulates the service industry, including via the spending patterns of urban residents.[15] 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 would fall to 12 percent in 2035.[16] As a result, labor productivity in agriculture will rise much faster, supporting higher incomes there. The decrease in the productivity gap between agriculture and the other sectors would underlie lower urban-rural income inequality. The ratio of urban over rural per capita income would decline to 2.7 in 2035, while the Gini coefficient would decrease to 0.38 in 2035.

## Conclusions

China's rapid growth is facing macroeconomic, environmental and social challenges that have their origin in its pattern of growth. Using simulations with a CGE model this paper 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 the accompanying foreign capital inflows.

[15] Urban residents spend 8 percentage point more of their income on services than rural residents (Jianwu He's note).

[16] This may seem fast. However, it is not exceptional compared with experiences in other South East Asian countries. For example, 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 in 2001.

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