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CHINA THROUGH 2020—A MACROECONOMIC SCENARIO

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Abstract

This paper sketches a macroeconomic scenario for China for 2010-20. Our growth accounting exercise finds that, with both the working population and total factor productivity on course to decelerate, potential GDP growth is likely to moderate in the coming 10 years, despite still sizeable capital deepening. Actual GDP should grow broadly as fast as potential GDP, continuing the track record since the late 1990s. With some rebalancing expected, the share of consumption in GDP is likely to bottom out and to rise somewhat through 2015 while the share of investment edges down. Robust economic growth in China would support imports. Meanwhile, given the outlook for the world economy, the share of exports in GDP may decline in 2010-2015 despite good competitiveness. As a result, the trade surplus may diminish relative to the size of China's economy. Even so, the external surplus would continue to rise in US dollar terms, especially the current account. In 2020 China's GDP per capita would be broadly comparable to the current level in Latin America, Turkey and Malaysia. Adjusted for purchasing power, in 2020 China's GDP per capita would be one-fourth of the US level and China's total economy larger than that of the US. The pace of catch up in current prices and market exchange rates will depend on the extent of real exchange rate (RER) appreciation. Past experience internationally suggests that, with a large portion of labor employed in agriculture, RER appreciation may be modest in the coming decade. However, demographic changes may speed up the tightening of the labor market and trend RER appreciation. Reflecting this uncertainty, two scenarios are presented, suggesting China may become the largest economy on this metric sometime between 2020 and 2030.

I. Introduction and summary

This paper sketches a macroeconomic scenario for China for 2010-20. The motivation is to get a sense of how the pace, pattern and composition of growth may develop in the coming decade, both from the production (supply) perspective and the expenditure (demand) perspective; what the key implications of this are; and how China's overall living standards and the size of the economy would compare internationally in 2020.

Issues of particular interest are how high can trend growth reasonably be, given the fundamentals; possible changes in the composition of demand and the structure of the economy after the global financial crisis and as a result of China's rebalancing efforts; the impact of these factors on the external surplus; and the likely role of relative price changes (real exchange rate appreciation) in China's catch up.

The scenario is not meant to be a precise, detailed investigation of the future. Rather, it is somewhat stylistic, based on analysis of how key macroeconomic variables have related to each other in the recent past and assumptions on how these relationships may evolve in the coming 10 years. Many of those assumptions unavoidably have an arbitrary element. The analysis is at the level of the whole economy. An earlier paper (He and Kuijs 2007) looked in more detail at rebalancing the pattern of growth, analyzing the sectoral decomposition of growth and the role of urbanization and job creation.

The paper is structured as follows. Section II briefly discusses China's growth experience and recent economic developments, as well as the short term economic outlook and policy issues. It concludes that, after a long period of sustained, rapid growth the government has started to focus on some imbalances and wants to rebalance the pattern of growth, making it less investment and industry focused, to address the imbalances. The international economic crisis has had a major impact on China's economy. Nonetheless, massive stimulus measures have kept China's economy growing robustly. While risks exist, the short term economic prospects remain fairly good.

Looking further ahead, section III discusses likely trend growth through 2020, using a growth accounting framework. It concludes that, with both the working population and TFP on course to decelerate, potential GDP growth is likely to moderate in the coming 10 years, despite still sizeable capital deepening. Nonetheless, this deceleration is from a very high rate and potential GDP growth remains favorable in our scenario.

Section IV discusses the composition of growth from the expenditure perspective. In the stylistic scenario, actual GDP would continue to grow broadly as fast as potential GDP, continuing the track record since the late 1990s. With some rebalancing expected, the share of consumption is likely to bottom out and to rise somewhat through 2015 while the share of investment edges down. With economic growth in China likely to continue to be robust, import volume growth remains solid. Meanwhile, given the outlook for the world economy and exports, export volumes are not expected to outgrow domestic activity in 2010-2015 despite good competitiveness. Thus, with some further impact from relative prices, the export GDP ratio should continue to diminish in that period. Even with favorable terms of trade on account of subdued commodity prices, the external trade and current

account surpluses are unlikely to rise again relative to the size of China's economy, although the current account surplus would continue to rise in absolute amount, in large part because of rising income on China's growing foreign reserves.

Section V looks at how China's living standards and the size of the economy would compare internationally in 2020. China's GDP per capita (in constant prices) would be broadly comparable to that of Latin America, Turkey and Malaysia now. In PPP terms, thus adjusted for purchasing power, China's GDP per capita would be one-fourth of the US level and China's total GDP in PPP terms would exceed that of the US by then.

How China's GDP and GDP per capita in current prices and market exchange rates will compare to other countries will depend on the extent of RER appreciation. Our tentative exploration of the international experience suggests that substantial RER appreciation normally only happens if most of the surplus labor in agriculture has been absorbed. China still has a high share of labor in agriculture. However, looking ahead, changing demographics may speed up the tightening of the labor market. Reflecting the ambiguity, two scenarios are discussed to benchmark how, in current prices and market exchange rates, China's living standards and size of the economy would develop vis a vis the US. These scenarios suggest China may become the largest economy on this metric somewhere between 2020 and 2030.

II.   Background—characteristics of China's growth, recent economic developments, short term prospects and policy issues

China culminated a long, successful reform and growth experience by growing exceptionally fast during 2003-2008. GDP grew by more than 10 percent on average during these 6 years, fuelled by (i) the fruits of economic reforms that continued to make labor and capital more productive, including those undertaken in the context of WTO accession and earlier SOE reform; (ii) ample saving to finance China's high investment, notably by enterprises and the government; (iii) improved macroeconomic management; and (iv) a very favorable global environment.

Nonetheless, before the onset of the global crisis, the government started to focus on growing economic and social imbalances that had emerged. Arising in no small part as a result of China's capital-intensive, industry led pattern of growth, these imbalances include (i) heavy reliance on investment and exports for economic growth with less focus on domestic demand, especially consumption; (ii) domination of industry, especially heavy industry, over services; (iii) rapid increase in demand for energy and other resources; (iv) widening income disparities, especially between urban and rural areas and between coastal and inland provinces; (v) pronounced unevenness in access to basic public services across regions; (vi) a mixed record in the improvement of environmental quality. The current 11th Five year Plan has as its key overall objective addressing these imbalances.

He and Kuijs (2007) modeled 2 scenarios through 2045, using a CGE model for China, one on "traditional policies" and one on a package of "rebalanced policies". It showed that the rebalanced scenario looks substantially better on the above dimensions while achieving broadly comparable overall growth.

The international economic crisis has had a major impact on China's economy. The international financial problems have had limited direct impact on China's financial system, because China's banks had modest exposure to sub-prime assets in the developed world and capital controls limit capital inflows and outflows, while large external surpluses mean that the financial system enjoys abundant liquidity and the central bank massive foreign reserves. However, China's real economy, integrated into the world economy via extensive trade and FDI links, could not escape the global downturn. With exports falling severely and the real estate sector—another important driver of growth—slowing down, overall growth slowed strongly in end 2008 and early 2009.

In spite of the global recession, though, China's economy grew 8.7 percent in 2009 on the back of massive stimulus. The stimulus was centered on infrastructure spending, combined with increases in transfers, consumer subsidies and tax cuts. Only about one-third of the stimulus was reflected in the budget, with the deficit rising from 0.4 percent of GDP in 2008 to 2.8 percent in 2009. Additional bank lending towards infrastructure projects run by LGIPs has been a key part of new bank lending of RMB 9.6 trillion in 2009, or almost 30 percent of GDP. Nonetheless, the lending surge was actually fairly broad based. Infrastructure made up one-half of total medium and long term (MLT) lending in 2009, compared to one-third in 2007. MLT lending to manufacturing, real estate (including mortgages) and other sectors also soared in 2009. The share of total new lending going to households, notably mortgages, increased from 14 percent in 2008 to 26 percent in 2009.

In addition, real estate investment gained prominence later in 2009 and household consumption growth held up well. Because of the steep fall early in the year, exports declined in 2009 as a whole. With imports strong, external trade was a major drag on growth in 2009 and the external current account surplus declined sharply. However, export volumes rebounded strongly since early 2009, and exceeded the pre-crisis level in early 2010. In a heated real estate market, surging property prices triggered policy measures in the spring of 2010.

Growth is on course to remain strong in 2010, with a shift in the composition. Government-led investment is decelerating. But, exports are likely to continue to recover amidst a pick up in the global economy and real estate activity is likely to grow most of this year. Consumption growth should remain solid. Inflation is back in decidedly positive territory. But, with global price pressures likely to be subdued amidst large spare capacity internationally, China's inflation is likely to remain contained. The external surplus is unlikely to increase again substantially this year.

To ensure economic and financial stability after the stimulus, policy attention has shifted to mitigating risks of a property bubble and strains on local government finances, including by increased vigilance on behalf of the central authorities towards lending by LGIPs.

In the medium term, the focus will be on rebalancing the economy and structural reforms. The global crisis makes rebalancing of China's economy more urgent and important and China needs more growth from domestic demand—consumption in particular. Also, relative prices need to change, notably those of energy, land, water, resources, environmental impact, and capital. The pattern of growth emerging in this setting would be driven more by the services sector, and less by industry (especially heavy industry).

To make the transition to such a pattern of growth easier and faster, structural policy adjustments in the following two areas are likely.

Measures to help channel resources to sectors that should grow in the new setting, instead of to sectors that have traditionally been favored and done well, include (i) financial sector reform, to improve access to finance for private sector, service oriented, and smaller firms; (ii) adjustment in prices and taxation, to remove subsidization of industrial inputs; and (iii) revision of the dividend policy for SOEs, to improve the allocation of capital. In addition, there may be measures to open up some service sectors to the private sector and remove restrictions.

A second area is policy reforms to support successful, permanent urbanization. Urban people consume more than rural people, and in particular spend more on services. Thus, more full urbanization stimulates the service sector oriented domestic economy. In addition to opening up service sectors, other key policy areas in the coming year may include further liberalization of the Hukou system; land reform; and reform of the inter-governmental fiscal system, to give municipalities the resources and incentives to provide basic public services (education and health) to migrants.

Medium and long term economic prospects remain good, although risks remain. Successful implementation of these reforms cannot be taken for granted. Nonetheless, China's prospects continue to be supported by broadly appropriate economic policies and institutions.

III.   Supply side—using the growth accounting framework

Building on Kuijs and Wang (2006) and He and Kuijs (2007), we use a Cobb Douglas production function to project potential output as a function of the capital stock (and thus investment); employment (largely determined by the population between 15 and 64), and total factor productivity (TFP). For details about the specification and key assumptions, see these earlier papers.[1]

This production function is first estimated over 1978-1994 and 1994-2009 (Table 1). The key findings of this exercise—discussed in more detail in the earlier papers—are: (i) the contribution of capital deepening to GDP growth soared in the 1990s to a very high rate; (ii) at the same time, TFP growth has remained high, compared to that in other countries; and (iii) together, these factors have boosted *potential* output—the capacity to produce—thus allowing China to have rapid GDP growth without running into macroeconomic stress such as high inflation or large external deficits.[2]

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[1] Notably Box 1 and Annex Tables 1-4 of He and Kuijs (2007).

[2] Annex Table 3 in He and Kuijs shows how the growth accounting results—on measured TFP growth and the contribution of capital deepening—are somewhat sensitive to the assumption on the elasticity of output with respect to capital and the starting assumptions on the capital stock, but not in a major way.

This production function, combined with projections for the key variables, is used to project potential output in 2010-20 (Table 1). All parameters—notably on depreciation and the elasticity of output with respect to capital and labor—are as in the estimation period. Other key inputs and assumptions are:

Table 1. Growth accounting (1978-2015); change, in percent

	1978-94	1995-2009	2010-15	2016-20
Potential GDP growth	9.9	9.6	8.4	7.0
Employment growth	3.3	1.0	0.2	-0.5
Labor productivity growth	6.4	8.6	8.2	7.5
From TFP growth	3.0	2.7	2.3	2.3
From higher H/L	0.5	0.3	0.5	0.6
From higher K/L ratio	2.9	5.5 **	5.4 ***	4.6
Memorandum items (in percent)				
Investment/GDP ratio (period average)	30.0	37.3	41.1	39.1

Source: NBS, and staff estimates.
* Methodology as in Kuijs and Wang (2006), but with human capital.
** The contribution from higher K/L is much higher in 2000-09 than in 1994-99.
*** This is influenced by the dramatic increase in investment in 2009.

- The contribution of investment and capital accumulation to growth remains high. Investment growth is likely to decline from 2010 onwards, after the massive expansion in 2009 and in line with the objective to rebalance the pattern of growth, towards less investment and industry and more consumption and services.[3] Even so, the investment to GDP ratio is likely to edge down only gradually. This is because the existing pattern of growth and resource allocation have a strong momentum and the rebalancing measures have so far been modest, in comparison. Investment of 39 of GDP in 2015-20 implies slowing but still rapid growth of the capital stock, which continues to contribute significantly to GDP growth (Figures 1 and 2).

- The demographic projections are from the 2008 UNPD projections, and labor supply behavior and labor market policy remain broadly unchanged. The latter implies an unchanged relationship between growth of the working population and employment growth. This means average growth of the working population and employment of 0.5 and 0.1 percent per year in

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[3] The shift towards more government-led, infrastructure oriented investment has lowered the short term impact of capital accumulation on growth, largely because the economic returns of investment in infrastructure are spread out over a longer period than those of investment in equipment. Moreover, government-led investment is likely to be less efficient, especially when the government goes "all out" to boost infrastructure investment. We assumed investment in 2009 was 5 percent less efficient in creating production capacity than normal.
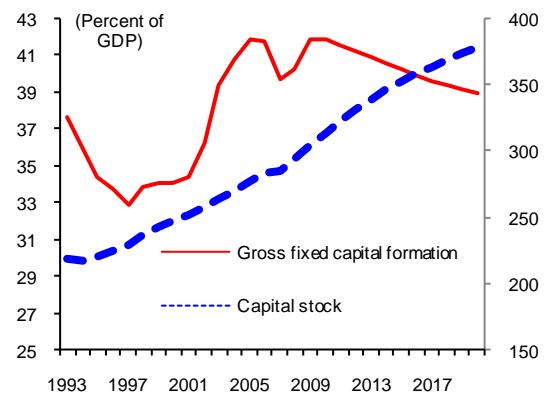
2009-15. In 2015-20, on these assumptions, the working population and employment would shrink by 0.1 and 0.5 percent per year.

Figure 1. Growth of the capital stock declines
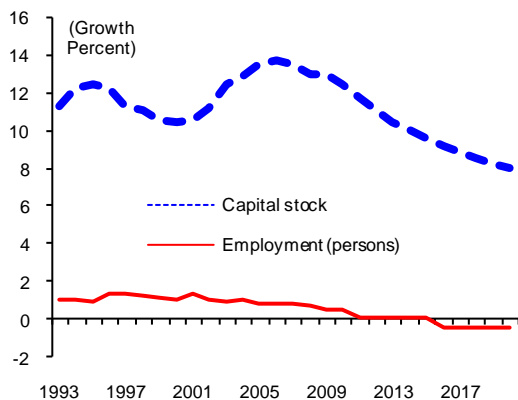
Source: CEIC, author's estimates.

Figure 2. But capital deepening remains high

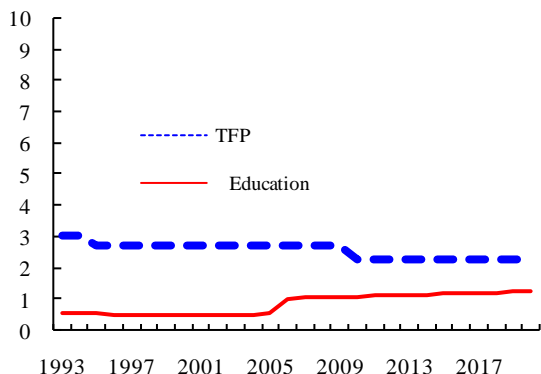Source: CEIC, author's estimates.

- Human capital per worker will continue to rise gradually, with the pace assumed to have increased somewhat since 2005 because of more government attention and spending on education (Figure 3).

- TFP growth moderates to a still relatively high rate (Figure 4). As productivity comes closer to that in developed countries, the rate of catch up in less developed countries and emerging markets tends to decline. In China during 1994-2009, particularly high TFP growth continued because of SOE restructuring, WTO accession, and very successful integration in the world economy of China's manufacturing industry and the associated economies of scale. In the coming decade, with a lower contribution expected from such forces, TFP growth is likely to ease. We assume it falls by 0.5 pp to 2.3 percent per year. This is still fairly high internationally, and assumes further structural reforms, but other Asian countries have been able to attain such a pace for a sustained period.[4]

Overall, on these mainstream assumptions, with both the working population and TFP on course to slow down, potential output growth is likely to moderate in the coming 10 years, growing at 7.7 percent in 2015 and 6.7 percent in 2020. Given that the demographics (and thus overall employment) are more or less exogenous, targeting significantly higher GDP growth would require either raising TFP growth or (even) higher investment. While the potential for TFP growth has bounds, more progress with rebalancing could mean more reallocation of labor from agriculture, more human capital formation, and higher services productivity. However, it takes time for higher efficiency gains to materialize. In the

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[4] See He and Kuijs (2007), Annex Table 2.

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meantime, targeting higher potential growth than in this scenario would require a substantially higher investment to GDP ratio, which is at odds with the government's objective to rebalance the pattern of growth.

Figure 3. TFP growth is likely to diminish

Source: CEIC, author's estimates.

Figure 4. Potential GDP growth is set to decrease
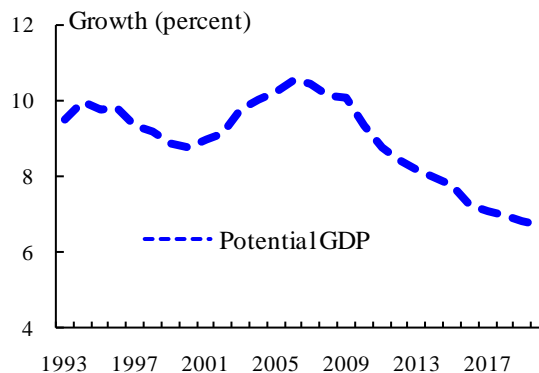
Source: CEIC, author's estimates.

IV.   Demand, or the expenditure components (until 2015)

Looking ahead, the expenditure components of GDP other than investment are determined in line with assumptions on their driving forces.[5]

- Private consumption is assumed to broadly grow in line with real household income. Our medium term outlook on the domestic economy, urbanization, and the urban labor market suggests continued robust wage and employment growth. Moreover, some further fiscal support to household disposable income is expected in the coming years, stemming notably from higher government spending on health, education, and social security.

- Exports are dependent on world imports. China's exports have in recent years continued to gain market share (Figure 5). In the coming 5 years, we expect China to continue to gain market share, reflecting the strong fundamental competitiveness of China's manufacturing sector. However, the market share gains are likely to be smaller than in the recent past, due to saturation effects. In addition, world import growth is likely to be more subdued. The assumption here is that world import growth is 1 pp lower in 2011-15 than in 1999-2008. In all, real export growth is likely to be substantially less than before—in this scenario it is 8 percent in 2012-2015. Under our assumptions, the global market share of China's exports (of goods and
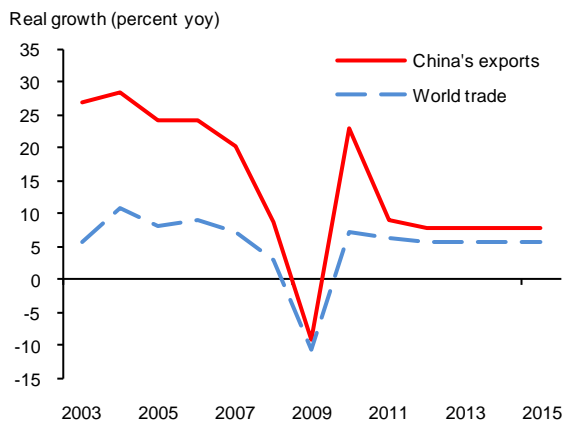
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[5] The demand side of the scenario is projected only to 2015, since projections further out become increasingly speculative.

services) would rise from 9 percent in 2009 to 11.6 percent in 2015. This is already a fairly high share, comparatively.[6] This suggests it may not be easy to have much faster export growth.
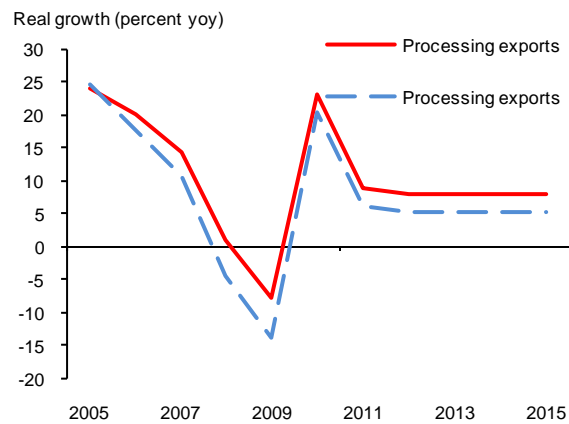
- Real imports are disaggregated into processing and non-processing imports.[7] Processing imports are assumed to grow broadly in line with processing exports. In 2004-08, real processing imports grew on average 2.8 percentage points slower than real processing exports, because of deepening of supply chains and increased domestic sourcing (Figure 6). In our base scenario, we assume a similar differential in 2010-15.

Figure 5. Exports and world trade	Figure 6. Processing exports and imports

Real growth (percent yoy)

China's exports
World trade

Real growth (percent yoy)

Processing exports
Processing exports

Source: CEIC, author's estimates.   *Source*: CEIC, author's estimates.

- Real normal (non processing) imports are assumed to grow broadly in line with domestic demand (Figure 7). In 2004-08, the average elasticity of normal imports with respect to domestic demand was 1.4, but it has tended to decline over time. Our scenario assumes that this decline will continue. Thus we assume an elasticity of 1.2 in 2010-15.

Based on these assumptions and projections, GDP growth would taper off from 9.5 percent in 2010 to 7.9 percent in 2015 (Table 2). Actual GDP would continue to grow broadly as fast as potential GDP, and the level of actual output would remain close to that of potential output, continuing the track record since the late 1990s (Figure 8).

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[6] In recent decades, only the US had a higher global market share. It peaked at 14 percent in 1998. It has declined to single digit levels since then.

[7] Real volumes of processing and non-processing trade are estimated using available trade deflators and information of the composition of the trade flows.

Table 2. Main Economic Indicators

*(percent change, unless otherwise indicated)*

	2007	2008	2009	2010 f	2011 f	2012 f	2013 f	2014 f	2015 f
Real GDP	13.0	9.6	8.7	9.5	8.5	8.2	8.0	7.9	7.9
Domestic demand 1/	10.8	9.4	13.8	9.6	8.5	8.3	8.2	8.1	8.0
Consumption 1/	10.2	8.8	9.7	9.5	9.1	9.1	8.9	8.9	8.9
Gross capital formation 1/	11.4	10.2	18.3	9.7	8.0	7.6	7.4	7.2	7.0
Contribution to GDP growth (pp)									
Domestic demand 1/	10.4	8.8	12.7	9.1	8.3	8.1	7.9	7.8	7.7
Net exports 1/	2.6	0.8	-4.0	0.4	0.3	0.1	0.1	0.1	0.1
Contribution net exports (WB, pp) 2/	3.5	1.8	-4.8	0.4	0.3	0.1	0.1	0.1	0.1
Exports (goods and services) 2/	20.0	8.6	-10.4	23.0	8.9	7.9	7.9	7.9	7.9
Imports (goods and services) 2/	14.2	5.1	4.3	26.4	9.0	8.6	8.4	8.4	8.4
Potential GDP growth	10.4	10.1	10.0	9.3	8.8	8.5	8.2	8.0	7.8
Output gap (pp)	2.4	1.9	0.5	0.7	0.5	0.2	0.0	0.0	0.1
External terms of trade	-0.9	-4.3	8.6	-6.4	-0.1	1.1	0.7	0.7	0.7
Gross national saving (% GDP)	54.1	52.0	51.4	51.1	50.9	50.8	50.4	50.0	49.6
Gross capital formation (% GDP)	43.1	42.5	45.4	46.4	46.2	45.9	45.6	45.3	44.9
Current account balance (% GDP)	11.0	9.4	6.1	4.7	4.7	4.9	4.8	4.7	4.7
Foreign exchange reserves (US$ bln)	1529	1946	2400	2705	3028	3395	3798	4247	4745

Sources: NBS, PBC, Ministry of Finance, and staff estimates.

1/ WB estimations using contribution to growth data (Table 2-20 in NBS Stat. Yearbook).
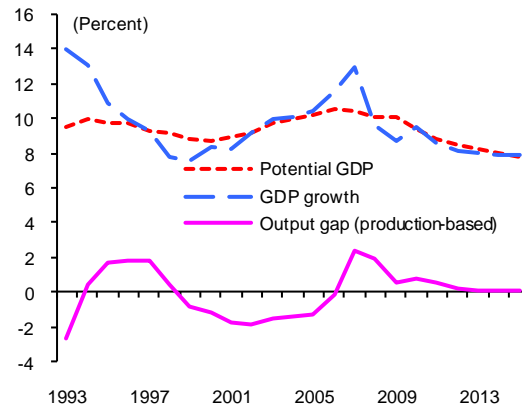
2/ WB staff estimates based on trade data for goods from the Custom Administration,

adjusted for estimated difference in price development for services trade.

Figure 7. Normal imports and domestic demand
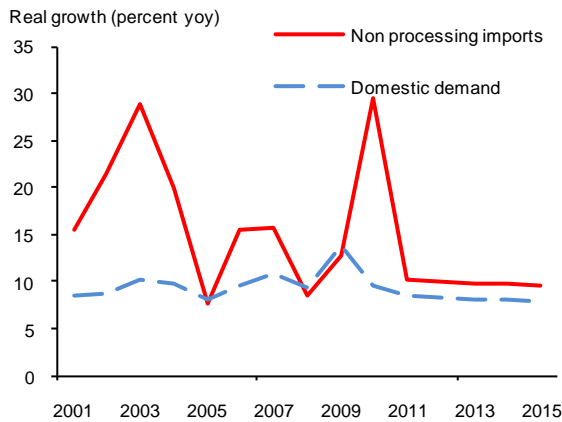
Source: CEIC, author's estimates.

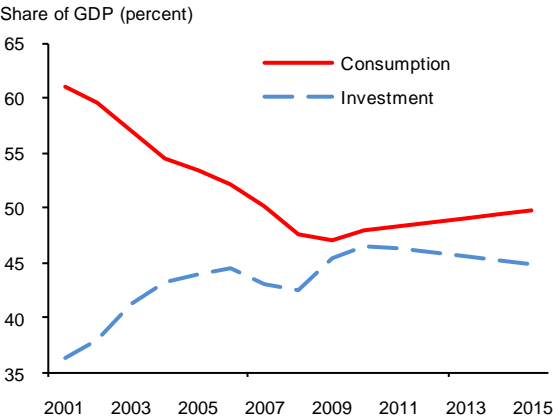### Figure 8. Actual and potential GDP growth

Source: CEIC, author's estimates.

There is some modest progress with rebalancing in this scenario, although less than in the "rebalanced" scenario in He and Kuijs (2007) (Figure 9). The share of consumption in GDP stops falling and rises somewhat through 2015. The ratios of investment and saving in GDP edge down gradually (Table 2). This

is based on our assessment that there is rebalancing taking place as a result of policy measures but that the measures outlined so far have been modest, compared to the momentum of China's traditional pattern of growth. Demographics are considered to play a modest role in reducing the saving rate in the coming decade, based on calculations using China's projected demographics and parameters estimated by Loyaza et al (2000).

China's export to GDP ratio probably peaked in 2007. China's export to GDP ratio fell markedly in 2008 and 2009. Exports are set to recover in 2010. However, given the outlook for exports described above, export volumes are unlikely to outgrow domestic activity in 2010-15 despite continued good competitiveness. Moreover, tradable prices are assumed to lag domestic prices. As a result, the export to GDP ratio would gradually diminish, in nominal terms (Figure 10), indicating a likely gradual shift in the nature of China's economy.

Figure 9. Consumption and investment	Figure 10. Exports and imports

Source: CEIC, author's estimates.
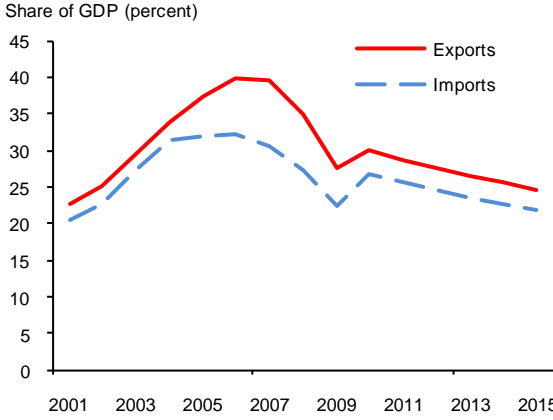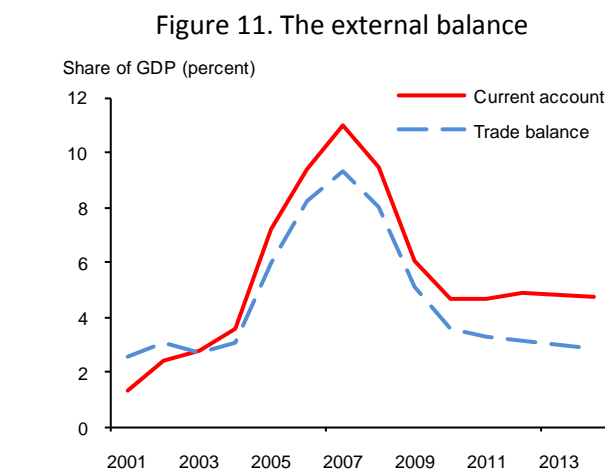

Source: CEIC, author's estimates.

In the medium term, import growth is likely to be somewhat higher than export growth. Economic growth in China is likely to continue to be robust. This should support import growth. This is so even though China's continued strong competitiveness is likely to lead to some further "crowding out" of imports, including in the processing sector.

The trade surplus is likely to diminish relative to the size of the economy, but the current account surplus not. In this scenario, after the massive negative contribution of net trade to growth in 2009, this contribution will be moderately positive in 2010-11, in constant prices. Given the assumptions discussed above, it is broadly zero from 2012 onwards. On the basis of the international prices assumed by the

World Bank, China's terms of trade will improve somewhat during 2011-15.[8] As a result, the trade balance would rise modestly in US dollar terms, but decline substantially as a share of GDP (Figure 11). With the external surplus remaining sizeable, China's net external assets continue to rise. As a result, the "income balance" of the current account should rise substantially, driving up the current account surplus over time in US dollar terms and keeping it broadly constant as a share of GDP.

External reserves are likely to continue to build on. Our projection is based on the above current account projections, and the following simplifying assumptions: (i) Net FDI converges to 0 as FDI outflows continue to increase while FDI inflows have peaked; (ii) Net other flows (including "hot money") are 0.[9] Foreign reserves would be $ 7.5 trillion at end 2020.

These results are sensitive to some of the assumptions. As discussed, the results of the growth accounting exercise for the past are not very sensitive to changes in the assumptions on parameters. With regard to growth accounting for the future, the sensitivity analysis is straightforward. For instance, if TFP growth were 0.5 percentage point (pp) lower, potential output growth would be 0.5 pp lower. Significantly less rebalancing than assumed here would mean higher investment and thus capital accumulation, but likely lower TFP growth, with uncertain overall impact on growth.

Figure 11. The external balance

Source: CEIC, author's estimates.

Turning to external trade, we assume that the elasticity of exports with respect to world imports is one. This is low compared to other estimates. This assumption reflects a believe that the spectacular increase in exports in the recent decade reflects supply side effects and one-off factors related to the integration of China's manufacturing sector in the world economy and should not be seen as a very elastic response of China's exports to increases in world imports. Based on this export elasticity, the direct/mechanical impact of changes in assumptions on world import growth on China's growth are modest. If world trade growth were to be 3 pp lower, this would mechanically reduce China's GDP growth by only 0.6 pp. However, indirect effects, notably via investment, could add substantially to that, although these are difficult to model other than by making arbitrary assumptions. As discussed above, we assume continued market share gain. Our export growth projection could also be seen as consistent with the

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[8] The World Bank's Development Economics department expects international energy and metal prices to be contained in the next 5 years by the large inventory overhang and agricultural markets to be "well supplied." See Global Commodity Markets, companion to the January Global Economic Prospects 2010.

[9] While getting a lot of attention, such flows have so far been small (accumulated $ 48 bln in the last 6 years).

lower world import growth using an elasticity with respect to world import growth of 1.4. Still higher assumed export elasticities would imply a larger role for exports and trade in the economy. However, we argued above that we think there are limits to the speed of further market share gains, given China's already high global market share. Changes to most of the other assumptions on the trade relationships do not alter the results materially. The exception is the elasticity of normal (non processing) imports with respect to domestic demand. If this were 1.6 instead of 1.2, China's GDP growth would be 0.6 pp lower and the current account surplus 2.1 percent of GDP lower in 2015.

V.   How would China's living standards and its economy compare internationally in 2020?

China's growth has been rapid in recent decades. But its overall level of development and living standards are still modest. China's GDP per capita was $ 3,678 in 2009, below that of Namibia and Ecuador. As argued in section III, China should be able to grow at a robust pace in the coming decades. This section looks at how China would compare with other countries in 10 years.

China's *future* living standards can be compared with other countries' *current* living standards. Using the growth projections outlined above, in *constant US dollars of 2000*, China's GDP per capita would reach $4,800 in 2020, about the 2008 average of Latin America and the Caribbean and almost as much as the 2008 level of Turkey and Malaysia (Figure 12).

China's future economy can also be compared to that of other countries' in the future. This is more difficult though, as it requires growth projections for the other countries and decisions on what prices to use. Sometimes such comparisons are done in constant prices and market exchange rates of a recent base-year. However, these comparisons are of limited use (Box 1).

Box 1. How to assess the relative size of countries and relative living standards in the future?

Constant prices of a baseyear. Comparisons of economies in the future are often done using constant prices and exchange rates of a baseyear. The downside is that the comparison is difficult to interpret, since it ignores changes in relative prices over time that are an integral part of development and catch up. For comparison, this would be like comparing GDP per capita in 2009 for Japan and the US in prices of 1950. Such a comparison provides little insight in today's purchasing power.

In current prices, on market exchange rates. This is the most objective metric, and the most useful metric to compare the size of economies and wealth. However, it tends to underestimate living standards and economic activity in poor countries, since prices of non-tradables are significantly lower in poor countries.

Using PPP exchange rates. This method tries to correct for the underestimation of economic activity in poor countries. The adjustment for purchasing power remains easy to interpret over time. Also, by better comparing the level of economic activity adjusted for price differences across countries, this method is useful in comparing the determinants for the demand for resources, including energy, across countries. However, it is not easy to have accurate estimates of PPP. During the 2005 revision of the International Comparison of Prices initiative, the PPP adjustment factors of many countries including China were revised sharply.

Comparisons of future activity and living standards at purchasing power parity (PPP) are easier to interpret. However, it is not easy to measure PPP exchange rates accurately (Box 1). World Bank estimates suggest a PPP adjustment factor for China of 1.8 in 2008. On this basis, and using Consensus Economics forecasts for GDP growth in the US, China's GDP per capita in PPP would increase from 15 percent of the US level in 2009 to 26 percent in 2020 (Figure 13). With its larger population, China's total GDP in PPP terms would exceed that of the US by then.

Figure 12. Comparing China in the future with other countries now

Constant 2000 $
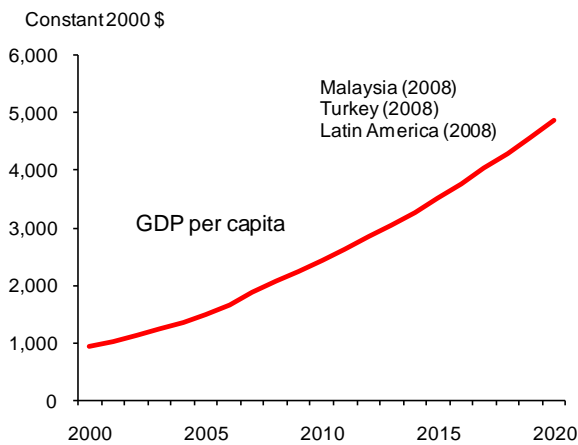
Source: CEIC, author's estimates.

Figure 13. Comparing China and the US in the future using PPP

Percent
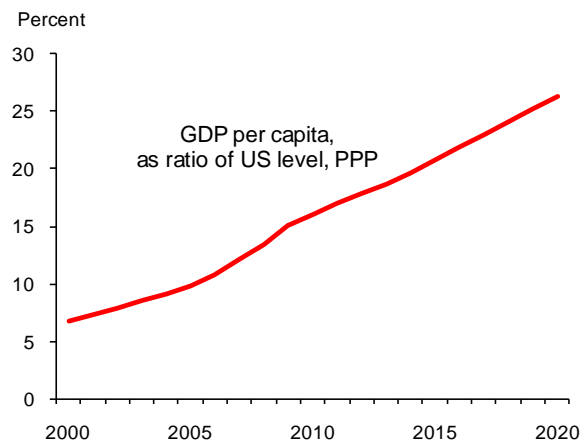
Source: CEIC, Consensus Economics (April 2010), author's estimates.

The usefulness of PPP comparisons notwithstanding, most interest still goes out to comparisons at current prices and market exchange rates. To do this for the future requires projecting how future price increases differ across countries, that is, projecting future real exchange rate (RER) movements.

RER appreciation plays an important part in the catch up of developing countries with more developed ones. Catch up is the narrowing of differences in GDP per capita in US dollar terms, and it generally takes place because of a combination of more rapid real GDP growth and appreciation of the RER.

The most well known and persuasive reason for RER appreciation during catch up is the Balassa-Samuelson (B-S) effect: rapid productivity growth in the traded goods sector pushes up wages. As long as wages in the tradable sector do not outpace productivity, unit labor costs are contained. However, as long as the labor market is not heavily segmented, wages also rise rapidly in the non-tradable sector. Productivity growth in this more service-oriented part of the economy tends to be lower than in manufacturing. As a result, unit labor costs in the non-tradable part of the catch up country rise relatively fast–faster than in the high income counties, leading to RER appreciation.

RER appreciation has played a large role in the catch up of some countries, but much less so in others. International projection exercises tend to use a rule of thumb with the RER appreciation a linear function of the rate of labor productivity catch up. This is the case for Goldman Sachs (2007 and 2010) and Price Waterhouse Coopers (2006 and 2008). However, some economies with rapid catch up have had large RER appreciation, such as the West European ones, Japan, South Korea, and, to a lesser extent, Hong Kong (China) and Singapore. Others including Chile, Thailand, Malaysia, and Turkey have had negligible RER appreciation, or even RER depreciation.

As suggested by Rogoff (2005), catching up countries may not see substantial RER appreciation if they still have significant surplus labor in agriculture. If many people are still working in agriculture, with incomes close to subsistence levels, productivity increases in industry are not necessarily shared fully with labor and wages tend to lag productivity. As a result, the B-S effect may not occur. Figure 14 plots for all countries with data available the average annual RER appreciation vis-a-vis the US dollar during 1980-2005 against the average share of employment in agriculture in that period. Indeed, barring 2 a-typical outliers, only (some of the) countries with modest shares of labor left in agriculture experienced RER appreciation, even though several of the countries without RER appreciation grew rapidly.

China has so far seen little trend RER appreciation. The current effective RER is broadly the same as before the reforms of the mid to end 1990s that greatly enhanced productivity (Figure 15).

Figure 14. Real appreciation typically only happens when surplus labor has been absorbed (1980-2005)
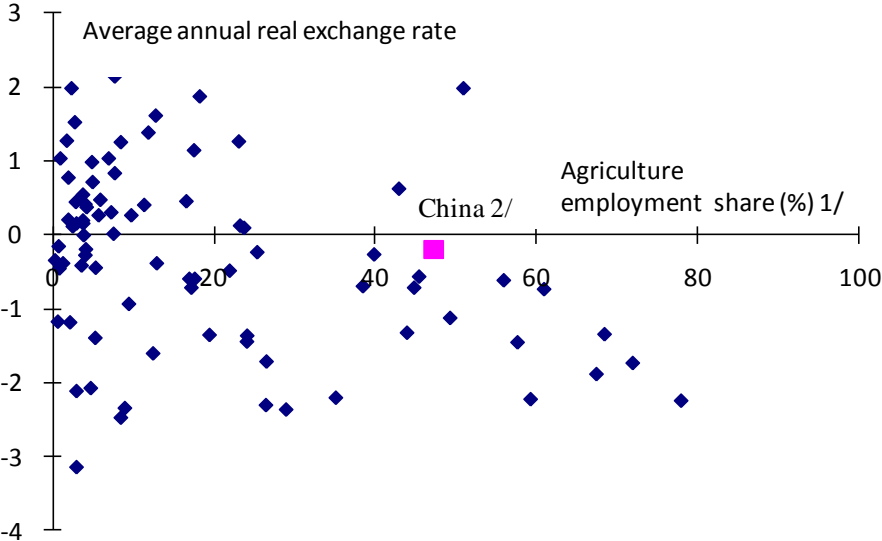
Sources: World Development Indicator and author's calculation.
1/ Period average. 2/ Calculated over the period 1993-2004.

However, with substantial wage growth for migrants in recent years, discussions on the possible exhaustion of surplus labor and the "Lewis turning point" have intensified in China, particularly after some high profile labor disputes and wage increases in May-June 2010. Several observers have concluded that China may soon exhaust its surplus labor.[10] If true, substantial sustained BS effects in the coming decade may drive up the real exchange rate.

It is not clear how much RER appreciation there will be in the coming decade. Looking at the labor market data, it seems unlikely that China has already exhausted its surplus labor. The official employment statistics suggest that over 40 percent of China's employees are still employed in agriculture, where labor productivity is 1/6th of that in the rest of the economy. Even after adjustment for possible overstatement of agricultural employment following Brandt, Hsieh, and Zhu (2008) by as much as 10 percentage point (see Appendix I of He and Kuijs for a discussion), agricultural employment is relatively high. This would suggest that surplus labor is still sizeable, especially considering expected future technological change in agriculture and additional surplus labor in the cities (see Special Focus in the September 2007 World Bank China Quarterly Update). Given the empirical pattern shown in Figure 14, this would suggest that sustained RER appreciation would still be quite some time away in the future. However, it is possible that China's upcoming demographic changes, which are going to affect the economy at a relatively early stage of development, will advance substantial trend RER appreciation in China compared to the typical pattern.

Figure 15. Nominal and real effective exchange rates
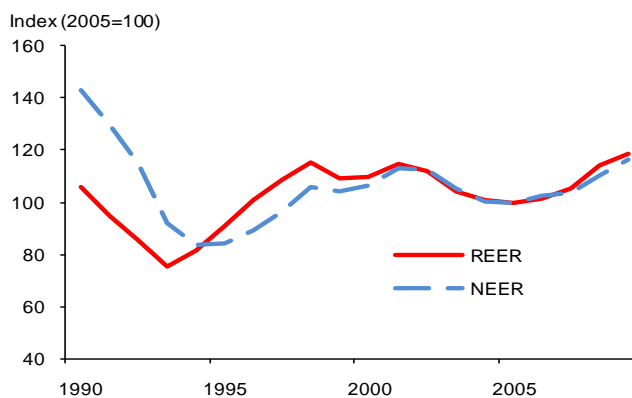
Source: CEIC, BIS, author's estimates.

Given the uncertainty over the pace of the RER in the coming decade, we present 2 long term paths. In the lower path, we assume average RER appreciation of 0.8 percent per year against the US dollar. [11] This is broadly the average of those countries with RER appreciation against the dollar during this period. . In this path, and using the Consensus Forecast growth projections for the US mentioned above, China's GDP per capita in current prices and exchange rates would increase from 8.2 percent of the US level in 2009 to 16 percent in 2020 (Figure 16). China's total GDP was 35.8 percent of that of the US in 2009. This ratio would increase to 66 percent in 2020. Extending the growth accounting, along this path China would overtake the US as the largest economy in 2029.

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[10] For instance, see Cai and Wang (2007).

[11] These paths are against the US economy and the US dollar, because this greatly simplifies the exercise. In reality, it is the effective exchange rate and the comparison of China with the group of trading partners that matters.

Along the upper bound path, the real exchange rate appreciation is assumed to be 3 percent per year. This is broadly in line with what it was in Japan during 1965-1990 and South Korea during 1970-1996.[12] It seems a high rate compared to the experience of most other countries. But, there may be some pent up room for real appreciation in China, after the resistance to it in the previous decade, including from possible adjustment of prices of resources. Along this path, using the same assumptions on real growth, China's GDP per capita in current prices and market exchange rates would increase to 20 percent of the US level in 2020 (Figure 17). China's total GDP would increase to 82 percent of that of the US in 2020. Along this path China would overtake the US as the largest economy in 2023.

The difference between the 2 scenarios is not so large through 2020, because real GDP catch up is relatively large then. Extending the scenario further out, the differences become larger, as the role of real catch up becomes smaller compared to that of RER appreciation.

How do these scenarios compare to others? Many international projection exercise use other metrics, often PPP. The forecasts of Goldman Sachs and PWC are also in current prices and also incorporate RER appreciation of catching up countries. The most recent Goldman Sachs scenario (2010) has 0.4 pp higher average real growth for China in 2011-20 and 0.5 pp lower average real growth in 2021-30. While the paper does not explicitly state the assumption on RER appreciation, it seems to be close to our higher appreciation path, since they envisage China becoming the largest economy in 2027. The PWC report only shows 2050 estimates and seems to use constant rates of growth and RER appreciation of around 2 percent per year. It envisages China becoming the largest economy in 2025.

Figure 16. China in current $, compared with the US, RER apprec = 0.8 %
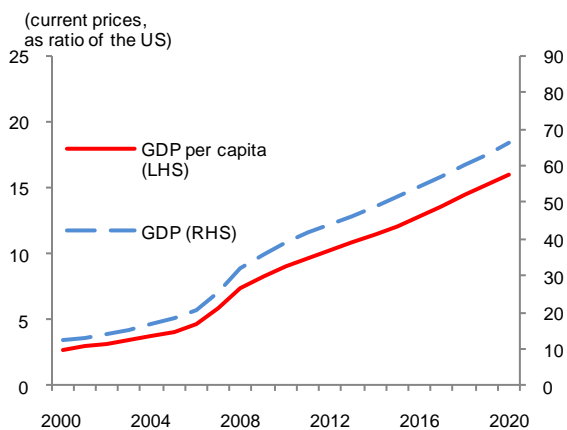
Figure 17. China in current $, compared with the US, RER apprec = 3 %

Source: CEIC, author's estimates.
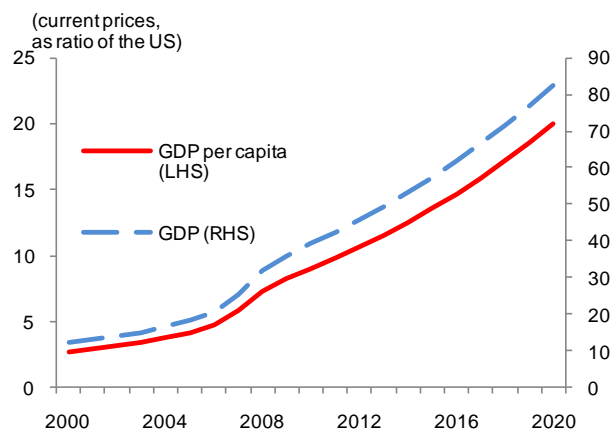
Source: CEIC, author's estimates.

[12] The starting points are determined by data availability. The end points are determined by a judgment on when the catch up was largely complete. Extending the period does not change the results significantly.

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