# TRÉSOR-ECONOMICS

Actual and potential growth in China

◼ Before the crisis, China enjoyed a period of buoyant growth, driven mainly by capital accumulation. It was able to maintain a high investment-to-GDP ratio thanks to abundant savings, partly a consequence of distortions in factor prices including the exchange rate, wages and interest rates. Productivity gains also contributed to China's outstanding performance, through technological catch-up but also via sectoral reallocations of labour from agriculture to industry.

◼ Since the 2008 financial crisis, however, China has been facing a sharp economic slowdown. The stimulus measures, which have led to a strong rise in investment, have admittedly offset the weakness of exports due to slacker external demand-but at the price of an aggravation of the economy's internal imbalances. Moreover, diminishing marginal returns on capital and an ever less efficient allocation of resources after the crisis have lowered productive efficiency and raised total debt, reflecting greater vulnerabilities. At the end of 2013, the authorities firmly committed themselves to rebalancing towards a more sustainable growth model.

◼ In this current transition, the French Directorate General of the Treasury and the Banque de France have prepared an estimate of China's potential growth to 2030, in order to measure the impact of rebalancing on Chinese prospects. Using a production-function approach, the estimate incorporates-with adaptations-the latest conceptual developments that highlight the role of credit in determining potential growth; it also takes into account the impact on total factor productivity (TFP) of a shift in sectoral reallocations towards services.

◼ On balance, our evidence suggests that the Chinese slowdown since the late 2000s is largely structural. GDP growth in 2014 was close to its potential, although with a mildly positive output gap. The downtrend in potential growth should persist, and may prove steeper in the medium term than the Consensus Forecast. Our findings point to the need for a fine calibration of fiscal policy, which could usefully accompany the structural transformations of the economy and the transition towards a more moderate and more sustainable growth model-while avoiding an excessive slowdown.

China: contributions to potential growth
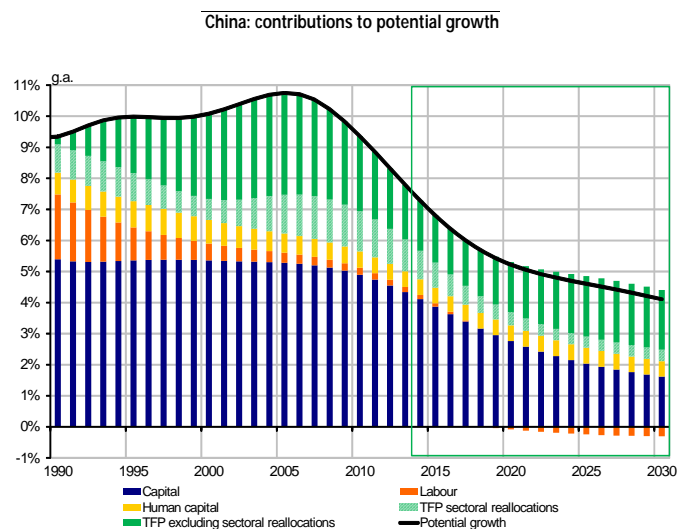
Source: DG Trésor calculations.

1. The exceptional vigour of Chinese growth in the past two decades has been driven by a catch-up effect and large-scale reforms-but also by imbalances

1.1 Capital accumulation and productivity gains have been the growth drivers

For the past two decades, China has posted exceptionally robust GDP growth, running at approximately 10% until 2009. The main driver has been investment, which has been particularly vigorous since the late 1980s. The ratio of investment to GDP nearly doubled in 20 years from 24% in 1990 to 45% in 2010, peaking at 47% in 2013 (see Chart 1). While some Asian countries such as Japan, South Korea and Thailand have adopted a similar development model based on capital accumulation, none has matched China's investment ratio.

Chart 1: China: GDP and investment

— GDP (year-on-year) — Investment (as % of DGP : right scale)
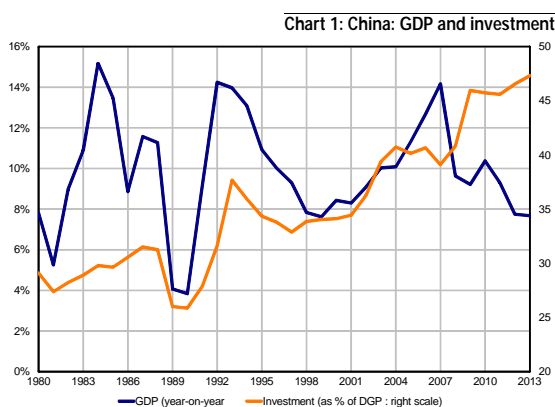
Source: NBS.

This powerful investment dynamic is due to a relatively low initial capital stock and heavy urbanisation needs. While China's capital per capita doubled between 2000 and 2010, it reached only 22% of the U.S. level, 23% of the Japanese level, and 30-40% of the level of other Asian countries (South Korea, Taiwan) according to the Penn World Table (PWT) (2013). Another explanatory factor is the urbanisation under way in China since the 1980s, which increased the need for housing and infrastructure.

Chinese growth has also been fuelled by productivity gains, which are the result of successive waves of reforms: the promotion of private-sector initiative in the 1980s, public-sector reform in the 1990s, and the trade opening in the early 2000s. They are also due to the absorption of foreign technologies via a catch-up effect, and to labour reallocations from agriculture towards the more productive manufacturing sector.

1.2 China also owes its outstanding performance to factor-price distortions

The undervalued exchange rate has enabled China to reap substantial benefits from its entry into the WTO in December 2001. Greater price competitiveness facilitated exports and gains in international market share, allowing a rapid absorption of rural labour into the manufacturing sector. This strong competitiveness also helped to attract foreign direct investment (FDI), stimulating investment and promoting technology transfers. The **weakness of wages** due to the excess rural labour supply played a similar role. Lastly, **financial repression[1], notably through low interest rates**, also helped to sustain robust investment growth.

Factor-price distortions also fostered abundant domestic savings–a prerequisite for maintaining a high investment ratio–in an environment characterised by a closed capital account and a strictly controlled banking system. The undervalued exchange rate and low wages curbed real household income, while low interest rates constituted an implicit transfer from households (as net lenders) to businesses. The national saving rate is extremely high, reaching 51.8% of GDP in 2013. According to Ma and Yi (2010)[2], this is due to the unusual combination of high savings in each of the three sectors of the economy: businesses, households and government.

These distortions have thus played a crucial role in the Chinese growth model, both directly (by stimulating investment) and indirectly (by driving up savings, and fostering productivity gains through sectoral reallocations and technology transfers). However, while they have sustained China's high growth rate, they have also been one of the main causes of its macroeconomic imbalances since the 2000s.

2. Since the crisis, the rise in debt has been associated with lower capital efficiency, a sign that the current growth model is losing momentum

The international financial crisis fundamentally altered the Chinese growth model, shifting it from growth driven by both exports and investment to growth driven by investment alone as well as by a sharp increase in debt. Slack economic growth in the advanced countries has considerably eroded international demand for Chinese products. Unfortunately, the export sector played a critical role in the Chinese growth model: given the internal imbalances–combining high investment and low consumption-productive capacity far outstripped domestic absorption capacity, and the excess production was exported. With the global economy no longer able to absorb China's surplus production, a capacity glut has appeared. Paradoxically, China has sought to offset softer global demand through greater reliance on investment, exacerbating the capacity glut. As investment has been financed by a rapid increase in credit, the growth model has become even more vulnerable.

(1)   Lardy, N. R. (2008), Financial Repression in China, Policy Brief PB08-8, Peterson Institute for International Economics.
(2)   Ma, G. and Yi, W. (2010), "China's High Saving Rate: Myth and Reality", *International Economics*, no. 122, pp. 5-40.

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2.1 The productive efficiency of investment has declined since the crisis

The rise in investment since the 2008-2009 crisis is mainly due to the economic stimulus measures enacted by the authorities in the form of a massive recovery plan exceeding 13% of GDP over two years. The share of residential investment surged from 7% to 10% of GDP between 2008 and 2013. Overall, the growth in investment doubled the capital stock between 2005 and 2011, fostering overcapacity in certain sectors. The decline in inflation since mid-2011 and the decrease in producer prices since early 2012 attest to this surplus capacity[3].

The capacity glut diminishes the efficiency of productive capital. The investment needed to generate the same level of GDP is rising steadily, as suggested by the ICOR indicator[4], which has moved from 4 yuan in 2000-2007 to 5.5 yuan in 2008-2013.

Admittedly, on a per-capita basis, China's capital stock remains low by comparison with the advanced countries (see above), but the comparison is not straightforward. Differences in technology, economic structure and labour skills, as well as the investment absorption capacity, can explain a lower capital stock per capita. Comparing China with other emerging economies, Lee *et al.* (2012)[5] concluded in 2012 that China had overinvested the equivalent of 12-20% of GDP in 2007-2011.

2.2 This lower productivity of capital since the crisis has been accompanied by a sharp rise in debt

The strong increase in the debt-to-GDP ratio since 2008 raises questions about the sustainability of the current growth model. The 2009-2010 investment plan was financed through borrowing by local government and public-sector firms, which ran up massive debt with banks and shadow-banking institutions. This caused total debt to explode from 120% to over 200% of GDP between 2008 and 2013 (see Chart 2). In the past, similar credit booms observed in other countries have often triggered banking and financial crises[6].

Chart 2: China: credit trend

Source: CEIC.
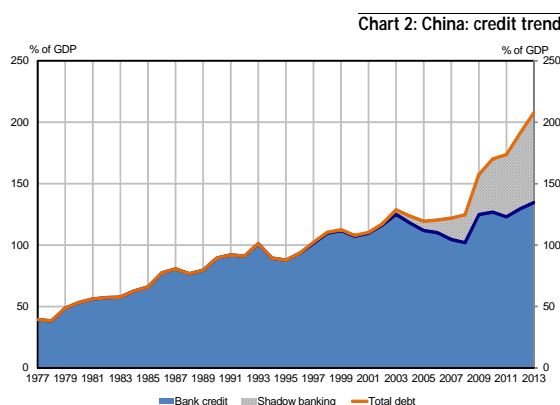
2.3 The authorities are aware that rebalancing is urgent and have announced a package of measures to achieve it

Beyond the external rebalancing already partly achieved since the crisis, China must conduct a domestic rebalancing that requires a decrease in savings to boost consumption and a cutback in investments yielding low returns. Until now, the share of private consumption in GDP has remained weak. Moreover, whereas the current-account surplus has fallen sharply since the crisis, the fall-off in external demand has been almost entirely offset by a rise in investment, which has fluctuated between 45 and 48% of GDP.

Several reforms may promote rebalancing in favour of consumption, particularly those concerning the expansion of social-insurance coverage, the liberalisation of interest rates, and *hukou reform*[7]. The authorities are aware of the urgent need to rebalance, and announced a set of measures to achieve it at the Third Plenum of November 2013[8].

3. The structural changes entailed by rebalancing make it all the more necessary to re-estimate potential medium- and long-term growth

The most suitable approach to estimate the impact of rebalancing on China's potential growth seems to be the method based on the production function, which involves capital stock and therefore, implicitly, investment. Recent studies by the BIS[9] on the U.S., the U.K. and Spain before the crisis have shown the importance of

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(3) See IMF, People's Republic of China, 2013 Article IV Consultation. In the 2012 Consultation, the IMF estimated that capacity utilisation had dropped to around 60% in 2011.

(4) The ICOR (Incremental Capital-Output Ratio) indicator is the ratio between investment in year t and the change in GDP between years t and t+1. The ICOR can be interpreted as a measure of capital inefficiency, for the higher the ICOR, the lower the productivity of capital.

(5) Lee, I.H., Syed, M.H. and Xueyan, L. (2012), Is China overinvesting and does it matter?, *IMF working paper* WP/12/277 November.

(6) Drehmann, M., Borio, C. and Tsatsaronis, K. (2011), "Anchoring countercyclical capital buffers: The role of credit aggregates", *International Journal of Central Banking*, 7(4), pp. 189-240.

(7) *Hukou* is the household registration system. The reform aims to turn rural migrants living in urban areas into fully-fledged residents, with access to social protection and public services.

(8) Third Plenum of the 18th Congress of the Chinese Communist Party. The reforms announced concern, in particular, the greater role of market mechanisms and optimal allocation of production factors. For more details, see www.ambafrance-cn.org/Le-contenu-des-reformes-economiques-et-financieres-portees-par-les-dirigeants-chinois-se-precise.

(9) Borio, C., Disyatat, F.P. and Juselius, M. (2013), Rethinking potential output: Embedding information about the financial cycle, *BIS Working Papers* 404, Bank for International Settlements.

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incorporating financial-cycle variables into estimates of potential growth: whereas standard methods had significantly overestimated potential growth in these countries, the introduction of credit variables appears to produce more robust results. Taking the BIS studies as a model, the Bank of Spain[10] examines a measure of "sustainable growth", defined as growth that does not create or aggravate imbalances; it is less volatile than the standard measure of potential growth. To examine the steep rise in credit in China, the methodology we have chosen draws on the findings of the BIS and Bank of Spain studies, with adjustments.

3.1 A supply-side approach for the production function

We estimate potential growth from a Cobb-Douglas production function with four compo- nentœ–**capital, labour, human capital** and total factor productivity–**whose returns to scale are assumed constant.** We extract these components by applying a Hodrick Prescott (HP) filter for each macroeconomic series[11]. For the period studied, 1995-2013[12], we use series from national or international sources, except for the capital series, which we restate to adjust for any imbalances due to China's vigorous capital accumulation.

We set the capital and labour coefficients at conventional levels of 40% and 60% respectively, similar to those used in the literature for other countries. We assume the parts to be stable in the estimation period and in the projection. In other words, our hypothesis is that China's income distribution will converge gradually towards the world average.

Box 1: Methodology for estimating the structural component of investment

We use the approach and GAP software developed by Planas and Rossi (2010)[a] of the European Commission, i.e., a bivariate state-space model that extracts the unobservable structural component of a variable (investment) from the interaction with another, observable variable (credit). This type of model is generally used to determine potential growth from observable variables such as unemployment or inflation. The state-space model is written as two equations, where the observed variable is a function of the unobserved variable (credit as a function of the investment cycle), whereas the unobserved variable (the investment cycle) is modelled as an autoregressive process. Such a model therefore posits that investment and credit have specific structural components, but common cyclical components. The credit cycle thus becomes a function of the present and past values of the investment cycle. We estimate the model parameters by maximum likelihood, and use a Kalman filter to generate the unobservable variable[b] (the investment cycle and, by differencing, its structural component).

Observed investment is thus broken down into a potentially non-stationary trend and a stationary cyclical component:

$$Ivt_t = trend_t + cycle_t \qquad (1)$$

The trend is modelled as a second-order random walk, implying that the trend slope is not stationary :

$$(1 - L)trend_t = \mu_{t-1} + e_t \qquad (2)$$

$$(1 - L)\mu_t = v_t \qquad (3)$$

L is the lag operator, and μ_t..., e_t and v_t are white noise.

The behaviour of the investment cycle is described by means of a second-order autoregressive process:

$$(1 - \rho_1 L - \rho_2 L^2)cycle_t = \varepsilon_{cycle,} \qquad (4)$$

With $\varepsilon_{cycle,t}$ a white noise.

Investment and credit are then linked by the following equation:

$$\Delta Credit_t = \varphi + \gamma(1 - L)^2 Ivt_{t-1} + \sum_{i=0}^{r} \beta_i cycle_{t-i} + \phi_1 \Delta Credit_{t-1} + \phi_2 \Delta Credit_{t-2} + v_t \qquad (5)$$

φ is a constant, r eis the number of lags for which the investment cycle is assumed to influence credit, β and ϕ are parameters to be estimated, and v_t is a white noise.

a. Planas C. & Rossi A. (2010), "Program GAP: Technical description and user manual", Version 4.2. *JRC scientific and technical report*, Joint Research Centre of the European Commission.
b. The Kalman filter assigns values to the unobserved variable and then predict values for the observed variable, so as to minimise prediction errors.

3.2 A demand-side approach to capital

China's vigorous investment growth since the crisis has been fuelled by an acceleration of credit that needs to be factored into the estimate of potential growth. Accordingly, to complement the supply-side approach, we seek to determine the GDP that could be obtained by using all available resources without generating imbalances, i.e., the growth that does not create credit imbalances. In practice, the notion of potential capital used here is thus equivalent to that of "sustainable" capital. It differs from the aggregate usually obtained by applying a filter to actual capital. We therefore try to include in our estimate only the investment component that does not generate credit bubbles. To segregate this component, we use the GAP software developed by the European Commission and typi-

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(10) Alberola, E., Estrada, A. and Santabárbara, D. (2013), Growth beyond imbalances: sustainable growth rates and output gap reassessment, Banco de España Working Papers 1313, Banco de España.
(11) The methodologies for estimating potential growth are recalled in Anand, R. et al. (Potential Growth in Emerging Asia, I*MF Working Papers* 14/02, 2014).
(12) We apply the HP filters to a longer period (1978-2030, including the forecasting horizon) to avoid their specific side effects.

cally used to determine potential GDP from imbalance variables such as unemployment or inflation. We adapt the methodology to separate the sustainable component of investment from its interaction with credit (see Box 1).

The use of this methodology entails a downward adjustment of investment of around 3-6 points for 2009-2011, in other words, between 1.5 and 3 points of GDP per year depending on the year examined. These results confirm the assumption that the strong debt dynamics in the post-crisis period are indeed linked to the strong investment dynamics. The investment adjustment translates into a decrease of approximately 0.5-1.1 points per year in the accumulation of productive capital stock (see Chart 3). Given the share of capital in the production function, this adjustment for overinvestment implies a decrease in potential growth of 0.2-0.5 points during the period.

Chart 3: Change in capital stock: adjustment for credit bubbles
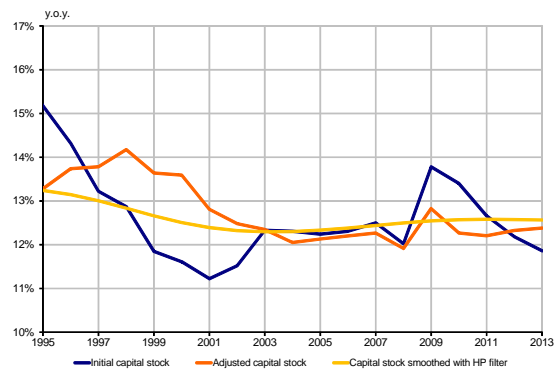
Source: NBS, DG Trésor calculations.

4. What long-term dynamics can we expect for China's capital, labour, human capital and total factor productivity?

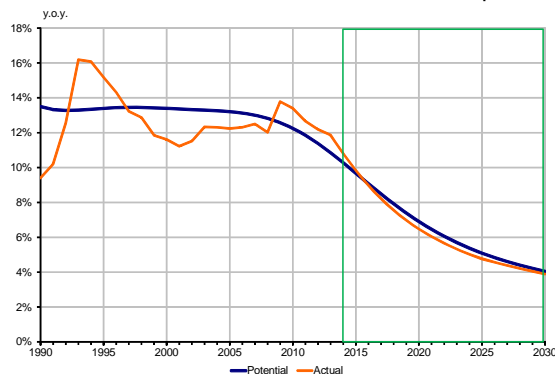### 4.1 Capital accumulation is expected to slow in the years ahead

The very high investment ratios recorded in the past two decades will be hard to maintain in the medium and long term, for three reasons: (1) excess industrial capacity in several sectors should gradually be eliminated; (2) the marginal return on capital should decline with capital intensity, reducing profitability and hence the incentives to invest; (3) the cost of capital should increase, in particular owing to the liberalisation of the banking and financial sector[13] and the likely resulting rise in the risk premium.

Chart 4: China: capital stock

Source: NBS, DG Trésor calculations.

In this context, our projections rest on the assumption of a gradual decrease in the investment ratio from 47% of GDP today to 34% in 2030. This hypothesis is consistent with that of Haltmaier (2013)[14] and with the rebalancing scenario of the World Bank and the Development Research Center of the State Council (People's Republic of China)[15]. To arrive

at an investment ratio of 34% in 2030, we assume that capital stock will follow a linear growth path starting in 2013. This would correspond to a slowdown in capital accumulation from approximately 12% a year today to 4% in 2030 (see Chart 4). Assuming constant distribution coefficients of 40% for capital and 60% for labour, the ultimate outcome would be a loss in potential growth of over 3 points.

4.2 The labour factor should drag down potential growth between 2015 and 2030

Since 1950, China's population has tripled–thanks to a vigorous birth rate and improved health conditions–**fuelling an increase in the labour force. However, labour-force growth has been trending down since the early 1980s,** from an annual average of 1.7% in the 1980s to 1.1% in the 1990s and 0.6% since 2000. Two of the main causes are the policy of birth restrictions introduced in 1970 and the "one-child" policy implemented since 1979.
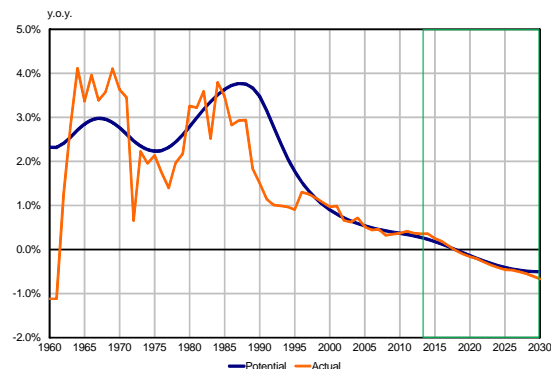
Chart 5: China: employment

Source: NBS.

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(13) Conversely, banking-sector liberalisation could offer greater access to credit for certain categories of economic agents.

(14) J. Haltmaier (Challenges for the Future of Chinese Economic Growth, International Finance Discussion Papers 1072, Board of Governors of the Federal Reserve System, 2013) uses the 34% investment ratio target in 2030 to create an alternative scenario for a decline in investment, which would lower GDP growth to 5.4% by 2030.

(15) China 2030: Building a Modern, Harmonious, and Creative High-Income Society, 2013.

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The positive effects of the demographic dynamics are turning negative. According to national statistics, the labour force grew by only 0.4% in 2012 and has been falling since. **China will thus face major demographic problems in the decades ahead:** the further decline in the labour force (by 2% between 2013 and 2030) will automatically influence potential growth, which will affect the saving rate and, ultimately, the cost of capital. **Our forecast broadly assumes that labour will follow the same path as the labour force**[16], under the hypothesis that NAIRU and hours worked remain constant (see Chart 5).

4.3 The contribution of human capital should increase with advances in education

China has achieved major gains in education. Barro and Lee's human capital index has been rising steadily since its creation. It posted a particularly steep increase between the mid-1980s and 1990 owing to the school reforms of the late 1970s. As a result, the average number of years of education for the population aged over 15 rose from 5.6 in 1990 to 7.5 in 2010[17] (Barro and Lee, 2014[18]).

The contribution of human capital to potential growth, while weak, should increase slightly through the growing share of earned income in total income, but also because the economy should produce more skilled-labour-intensive goods. **Overall, we forecast that human capital will grow by an annual average of 0.8%, the value observed in 2008-2011** (see Chart 6).

Chart 6: China: human capital
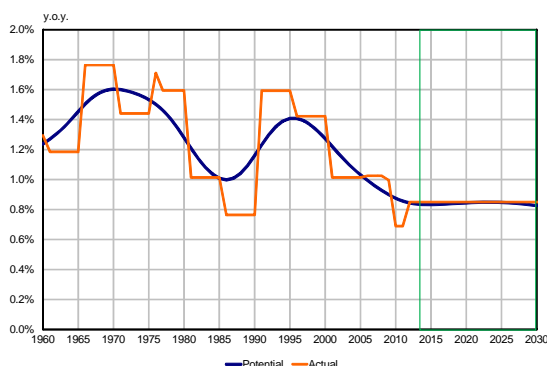
Source: PWT (Barro and Lee).

4.4 Total factor productivity will grow more slowly than in the past, as the rebalancing of the economy will entail a smaller contribution from sectoral reallocations of labour

The strong contribution of TFP to growth in the past (TFP being calculated as a residual of the Cobb Douglas function[19]) had four main causes: (1) the reallocation of labour from the low-productivity primary sector to the more productive secondary sector; this triggered a massive migration from rural areas to urban areas, estimated at around 200 million people in all; (2) gains from the trade opening that followed China's accession to the WTO in 2001; (3) structural reforms, particularly the privatization of State-owned enterprises in the early 1990s; (4) other developments such as the growing access to foreign technologies and the rise in R&D investment (the share of R&D in GDP rose from 0.9% in 2000 to almost 2% in 2012, a level nearly comparable to that of the developed economies).

The rebalancing of the Chinese economy should entail a sectoral shift towards services, where productivity gains are smaller. Urbanisation should gradually slow-and, with it, the associated reallocation of labour from the primary sector to other sectors. It is therefore important, **in our projections,** to separate the contributions of sectoral reallocations, so as to allow for these trend inflections. Box 2 gives a breakdown for determining the extent to which factor movements (of capital and labour) between sectors (agriculture, industry, services) impact the change in total factor productivity. In our projection, and under the sectoral projection hypotheses of the World Bank (for GDP and employment), sectoral reallocations should contribute less to TFP gains than previously.

Intra-sectoral TFP-i.e., the productivity resulting from changes within a given sector-had been gradually accelerating before the crisis, posting annual gains of 3.5% or so between 2000 and 2008. Since the crisis, its gains have slowed sharply, to approximately 1% a year in 2012-2013[20]. To achieve larger TFP gains, China would need to evolve towards a higher-value-added economy. However, the scope for such a transition appears limited at present, for the output of products with technology content[21] has been stagnant since the crisis, and these products accounted for 26% of China's manufacturing exports in 2012 according to the World Bank.

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(16) We use the labour-force projections of the Paris-based CEPII research institute, which are based in turn on UN projections of the working-age population (medium fertility growth scenario to 2050) and on participation rates calculated from ILO data.

(17) The average length of education was 10.7 years for France and 12.4 years for Germany in 2010.

(18) Barro, R.J. and Lee, J.W. (2010), "A New Data Set of Educational Attainment in the World, 1950-2010", *Journal of Development Economics*, vol. 104, pp. 184-198.

(19) It should be noted that TFP is calculated as the residual of the production function taking into account the unadjusted capital series so as not to increase TFP artificially.

(20) These results are also consistent with those of the Conference Board (The Long Soft Fall in Chinese Growth, 2014, p. 25) and the World Bank (Bulman, D. and Kraay, A. (2013), Thirty Years of Growth in China: Accumulation, Reallocation, and TFP Growth, unpublished working paper, World Bank; quoted in Urban China report, fig. 1.2, p. 87).

(21) High-technology exports (expressed as a % of manufacturing exports) are products with high R&D intensity in sectors such as aerospace, IT, pharmaceuticals, scientific instruments and electrical machinery.

Nevertheless, the changes in intra-sectoral TFP will also depend on the reforms enacted. Reforms are crucial to ensuring balanced, sustainable growth. We assume a full implementation of the reforms announced by the authorities at the Third Plenum, with a positive but gradual effect on productivity that will shift the economy upmarket. As a result, intra-sectoral TFP gains should gradually accelerate to 2% a year by 2025 (see Chart 7).

Our projection shows broadly stable gains in TFP for the whole economy (excluding human capital), reaching 2.3% a year by 2030. The impact of reforms on intra-sectoral TFP would, on balance, offset the decline in the contribution of sectoral reallocations.

Chart 7: China: breakdown of TFP

Potential TFP: sectoral reallocations — Actual TFP: sectoral reallocations
Potential intra-sectoral TFP — Actual intra-sectoral TFP
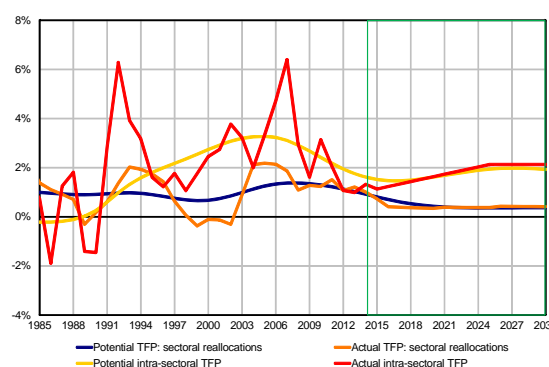
Source: national statistics, DG Trésor calculations.

Box 2: **Determination of intra-sectoral and inter-sectoral components of total factor productivity**

To segregate the contribution of sectoral reallocations, we examine a Cobb-Douglas production function for each of the three sectors of the economy: agriculture, industry, services:

$$Y_i = A_i K_i^{\alpha} L_i^{(1-\alpha)}$$

with $i = 1,2,3$, and α identical for the three sectors

$$Y = \sum_{i=1}^{3} Y_i, \; K = \sum_{i=1}^{3} K_i \; et \; L = \sum_{i=1}^{3} L_i$$

GDP growth is written:

$$\frac{dY}{Y} = \sum_{i=1}^{3} \left(\frac{Y_i}{Y} \right) \frac{dY_i}{Y_i}$$

$$\frac{dY}{Y} = \sum_{i=1}^{3} \left(\frac{Y_i}{Y} \right) \frac{dA_i}{A_i} + \alpha \sum_{i=1}^{3} \left(\frac{Y_i / K_i}{Y / K} - 1 \right) \frac{dK_i}{K} + (1-\alpha) \sum_{i=1}^{3} \left(\frac{Y_i / L_i}{Y / L} - 1 \right) \frac{dL_i}{L} + \alpha \frac{dK}{K} + (1-\alpha) \frac{dL}{L}$$

Productivity gains (TFP) are thus written:

$$\frac{dA}{A} = \sum_{i=1}^{3} \left(\frac{Y_i}{Y} \right) \frac{dA_i}{A_i} + \alpha \sum_{i=1}^{3} \left(\frac{Y_i / K_i}{Y / K} - 1 \right) \frac{dK_i}{K} + (1-\alpha) \sum_{i=1}^{3} \left(\frac{Y_i / L_i}{Y / L} - 1 \right) \frac{dL_i}{L}$$

- The first term denotes intra-sectoral TFP gains ;
- The second term denotes reallocations of capital;
- The third term denotes reallocations of labour.

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5. Significantly slower potential growth is to be expected in the coming decade

5.1 Potential growth has slowed in recent years, from around 10% before the crisis to 7% or so in 2014

In the past, China's potential growth has been driven mainly by capital accumulation and robust TFP–in contrast with the modest contributions from labour and human capital. The labour factor contribution has decreased steadily since the 1970s-1980s, amid the slower increase in the labour force. The contribution of the human capital factor has also declined regularly, in particular since 1995.

According to our estimates, potential growth was running at close to 10% in the 1990s-2000s, easing to 7% or so in 2014 (see Chart p. 1).

5.2 These results call for a fine-tuning of fiscal policy that will support the transition to a more moderate and more sustainable growth

The main cause of the economic slowdown since 2011 appears to be structural. This is borne out by the fact that potential growth has decreased as well, owing to overinvestment and the deceleration in total factor productivity. At the cyclical level, the post-crisis slowdown in exports has been broadly offset by massive, steady fiscal support since 2008: according to the IMF, the "augmented" public deficit, i.e., including local government, rose from less than 4% of GDP in 2007 to 10% in 2013. As a result, actual growth remained more or less in line with potential growth in 2011-2014.

The output gap[22] was a slightly positive 0.7 points in 2014. The acceleration in Chinese growth before the 2008 crisis (peaking at 14.2% in 2007) reflected an overheating that led to a positive output gap of 1.0 points in 2007 (see Chart 8). The structural slowdown has continued in 2015 and, as some indicators suggest, it could be compounded by a cyclical downturn.

Chart 8: China: output gap
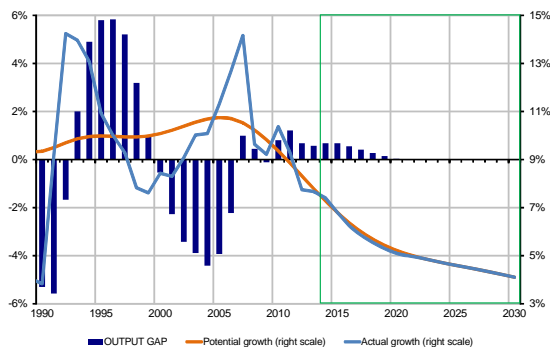
Source: national statistics, DG Trésor calculations.

This situation may require caution in the use of recovery instruments. Since the massive stimulus in 2008-2009, China has routinely resorted to "mini-stimuli", notably through investment and credit, as soon as the economy has lost momentum. A continuation of these stimulus policies could perpetuate the economy's present imbalances, raising the possibility of a more abrupt adjustment in the longer run. By contrast, measures to support household consumption-such as a strengthening of the social protection system that might reduce precautionary savings-could help to rebalance the economy towards a more sustainable model.

5.3 Our scenario therefore points to a gradual decline in potential growth to 5% in 2020 and 4% by 2030

In view of the rising imbalances observed in the recent period, China's growth model is likely to evolve in the years ahead, entailing a further decline in potential growth. Under our assumptions, this outcome would result mainly from a progressive rebalancing of the Chinese growth model (1) towards more consumption, hence a more moderate role for capital accumulation, and (2) towards services, implying a lesser contribution of sectoral reallocations to productivity gains.

In our scenario, the decline in potential growth, while gradual, would be faster than what most forecasters currently expect: it would slow to approximately 5% by 2020, and around 4% by 2030–in other words, to nearly half its present level. The decline would also be relatively more dependent on changes in TFP, given the expected contraction in the labour force and slacker investment. This downtrend in potential growth would justify the authorities' continued efforts to scale down medium-term growth targets, consistently with the patterns observed in recent years.

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(22) The output gap is positive when actual GDP exceeds potential GDP.

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