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AN ANALYSIS OF CHINA'S ECONOMIC GROWTH PROSPECT FOR 2005-2020

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1. Introduction

After two decades or so of rapid economic development since the beginning of reform and opening up, the Chinese economy has entered a new and dynamic period of development. During this period, China will have important strategic opportunities for its economic development and all the economic and social tensions will be prominent. If China can seize these opportunities, overcome the difficulties in advance, solve the problems arising from development and maintain rapid economic growth, its economic strength and its overall national strength will move to a new high and the living standard of its people will rise to a new level.

The development of the Chinese economy in the future will face a changing internal and external environment as well as various opportunities and challenges. Due to the interaction of these uncertain factors, the economic development will also have great uncertainties. Selecting different development strategies will lead to different development results. This paper used scenario analysis to simulate the prospect of China's economic development during the 11th Five-Year Plan and an even longer time.

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* This report is one of a series of research papers on "Guiding Principles for the 11th Five-Year Plan and the Long-Term Goals by 2020".

Development Research Center of the PRC

First, we tried to give a base growth scenario in light of the unique features of the development and structure of the Chinese economy. Based on the past and present development features, the base growth scenario analyzes development trends, from which possible scenarios will be derived. In addition to the base growth scenario, we designed two additional scenarios. One is a coordinated development scenario, in which the economy, society, resources and the environment will develop in a coordinated manner, in keeping with the requirements of the scientific concept of development and through industrial restructuring and efficiency improvement. The other is a "risk" scenario, which will give more consideration to the possible risks that might be encountered in the future.

The model used by this research is the DRCCGE2004 version of the dynamic recursion China CGE model developed by the Development Research Center of the State Council. The time span for the simulation ranges from 2005 to 2020.

2. Scenario Design

First of all, this paper hypothesized some external factors and simulated various scenarios of China's economic growth and structural changes from 2000 to 2020 in light of the unique features of the growth and structure of the Chinese economy and development trends (see Table 1). In simulating various scenarios, we also hypothesized the growth trends of population and labor, the process of urbanization, the growth rate of government consumption and the total factor productivity (TFP)[①]

[①] TFP is mainly set through model dynamics on the basis of the TFP growth rate over the past two decades or so.

What we need to emphasize is that we also designed the preference of technological advance, which means that the advance of productivity is not neutral to different sectors. In the simulation, the share parameters for the production function (including the coefficient of intermediary inputs) are all updated so as to reflect the preference of technological changes in inputs.

The base scenario forecasts that the Chinese economy will continue its past development trend, the labor force will continue to move fast, human resources accumulation and technological advance will likely bring about an incremental effect of scale, system reforms will deepen further, the reform of the financial system, the trade system, the investment system and the state-owned enterprises will promote a more rational and effective allocation of the factors between different sectors and different regions. The interaction of all these factors will help maintain the TFP growth during the 2005-2020 period at the level of the past 25 years. That means the average annual growth rate will be between 2.0 percent and 2.5 percent. Urbanization and industrialization will move forward rapidly. Urbanization will continue to move forward rapidly at an average annual pace of 1.1 percentage points, expected to reach about 49 percent by the end of the 11th Five-Year Plan and about 60 percent by 2020. Technological advance in the future will continue to have a certain preference.② The savings behavior of the Chinese people will unlikely change dramatically during the 11th Five-Year Plan but the savings rate will drop slightly after 2010. The WTO-related tariff concessions and other commitments will be fulfilled and the impact arising from WTO accession will continue.

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② The preference of technological advance and the changes in the rate of intermediary inputs are mainly set with reference to the change trends reflected in China's input and output sheet 1987-2000 and the change trends of the relevant parameters of the United States.

The Fourth Plenary Session of the 16th Party Central Committee put forward the scientific concept of human-oriented, all-round, coordinated and sustainable development so as to better push forward economic and social development. This will be a basic guideline for China's development in the future. In keeping with this concept of development, we designed a coordinated development scenario. This scenario is based on a rapid and smooth progress in the reform of various systems, the stronger roles of the market in resource allocation, the vigorous advance in restructuring, and the progress in changing the mode of economic growth. On the basis of the base scenario, we further hypothesized that the industrial structure would be further upgraded, and the reform of the systems and rules would promote a rapid development of the service industry (especially the productive service industry) and eventually help optimize and upgrade the whole industrial structure. In the meantime, further market-oriented reforms would straighten out the prices of various resources (including energy), rationalize the allocation of resources and increase the efficiency of resource and energy utilization of enterprises. Therefore, we hypothesized that the preference of technological advance and the changes in the rate of intermediary inputs would further favor the coordinated development of all industries on the basis of the base scenario. In particular, the intermediary use of the service industry and the high-tech industries by various sectors would be faster and push up the added value of the high-tech industries. On the basis of the base scenario, the TFP growth rate of the service industry would be one percentage point higher each year during the 2005-2010 period and 0.5 percentage points higher each year during the 2010-2020 period. On the basis of the base scenario, the efficiency of energy utilization would be 0.2-0.5 percentage points higher and the movement of agricultural labor to non-farm industries would be fast.

Table 1 Scenario Designs for the Analysis of the Prospect of China's Economic Growth

Experiment	*Description*
	Base condition for all senarios
	1. Population growth and composition exogenous 2. Labor growth and land supply exogenous 3. Tariff reduction and quotas elimination according to the WTO protocol 4. All tax rates are fixed at its base year level. 5. Balance of payment gradually declines to zero in 2010. 6. Governmental consumption growth exogenous
BAU	***Business-as-Usual*** 1. labor transfer from agriculture to non-agriculture quickly 2. The change trend of the ratio of intermediate input exogenous 3. Total factor productivity（TFP）growth exogenous，according to the same level in the past 25 years，2.0%~2.5%
Coordination	***Harmonization coordination Scenario*** 1. The change trend of the ratio of intermediate input is apt to harmonious development of all industries, i.e. the intermediate demand for service and high technology goods increases, the rate of value-added in high tech. industries increases. 2. TFP growth rate of service sectors is 1% higher than BAU in 2005～2010, 0.5% in 2010～2020. 3. The efficiency of energy utilization is 0.2%～0.5% higher than BAU 4. labor transfer from agriculture to non-agriculture quickly
Risk	***Risk Scenario*** 1. labor transfer from agriculture to non-agriculture slowly relative to BAU 2. Household propensity to consumption is lower than BAU 3. The growth rate of governmental consumption is higher than BAU 4. Total factor productivity（TFP）growth exogenous，lower than the level in the past 25 years, 1.5%~2.0%

In consideration of all the uncertain factors that may confront future development, we also simulated a “risk” scenario. This scenario emphasizes some main challenges and risks to China’s economic development in the future. (1) The reforms of the banking system and the state-owned enterprises fail to move forward as expected and the development of the capital market is slow, which will make it difficult to avoid inefficient capital use in the early years of this century or a longer time. (2) The urban public products that are in a relatively short supply will constitute constraints to labor flow and urbanization, the obstacles confronting system reforms will slow down such reforms, and the progress in labor flow will be slow. (3) Ageing population and higher rates of support will lead to a decline in savings rate (investment rate). (4) Increased trade frictions will have negative impacts on import and export. All these factors will affect China’s future TFP growth rate to a certain degree. With regard to these factors, we presumed in the “risk” scenario that the TFP growth rate would be lower than the average level of the past 25 years, at an average annual growth rate of 1.5-2.0 percent, that labor flow would be slower and personal savings rate would be lower than in the base scenario.

3. Prospect Analysis for 2005-2020

Based on the above hypotheses, we worked out the simulation results for the three scenarios by employing the DRCCGE2004 model.

3.1. Base scenario

Table 2 shows the projected economic growth during the 2000-2020 period for the base scenario. In light of the current trend of economic growth, the economic growth rate during the 10th Five-Year Plan is estimated to be 8.7 percent. The base scenario

indicates that the GDP growth rate will be 8.1 during the 11th Five-Year Plan, slightly lower than during the 10th Five-Year Plan and that the economic growth rate will be 7.5 percent and 6.8 percent respectively for the 2010-2015 period and the 2015-2020 period. Overall, the economic growth in the first 20 years of this century will still be fairly fast, at an average annual growth rate of 7.8 percent.

Table 2 Economic Growth & its Sources for 2000-2020 (%, base scenario)

	2000-2005	2005-2010	2010-2015	2015-2020	2000-2020	2005-2020
GDP	8.7	8.1	7.5	6.8	7.8	7.5
Sources of growth						
Labor	0.5	0.4	0.2	0.0	0.3	0.2
Capital	6.4	5.6	5.0	4.5	5.4	5.0
TFP	1.9	2.1	2.3	2.3	2.1	2.2

In terms of the sources of economic growth, the main driving force for China's rapid economic growth for 2000-2020 remains the rapid capital accumulation. Although the contribution of capital input to GDP growth is progressively declining, it will continue to be as high as 65-70 percent. The rapid capital accumulation is attributable to the high rate of domestic savings (high rate of investment) and the fast-growing foreign direct investment. It is expected that the high savings rate and high investment rate will continue during the 11th Five-Year Plan. As the changes in the age structure of the population will result in a higher rate of support, as the social security system will continue to improve and as the government's financial policy changes, the savings rate (investment rate) will decline somewhat, to about 35 percent in 2020. Compared with capital, the contribution of the quantitative growth of labor will be very small. This is mainly determined by the changes in the age structure of China's population. The working-age population will continue to grow fairly fast before 2010 and the contribution of labor growth to GDP will stay largely at about 5 percent. With the changes in the age structure of the population after 2010, labor growth will slow down

and its contribution to GDP will also be declining. By 2020, the contribution of quantitative labor input to economic growth will be close to zero. The rapid TFP growth will become another leading push for China's sustained and rapid economic growth and its contribution will be increasingly higher.

China is still in the period of industrialization, and rapid changes in industrial structure are an important feature of this period. Annex 2 shows the industrial structure and the structure of foreign trade for the 2000-2020 period. The simulation results indicate that the ratios of the primary, secondary and tertiary industries will be 10.7:54.1:35.2 [③] at the end of the 11th Five-Year Plan, which will change to 7.1:52.5:40.4 by the year 2020. The proportion of the primary industry will persistently decline during the 11th Five-Year Plan and through to 2020. The proportion of the secondary industry will continue to rise during the 11th Five-Year Plan, which will be mainly manifested in the expansion of the energy sector arising from the rising demand for energy and the rising demand for capital goods in the intermediary inputs arising from the high rate of investment. In a sense, this is also a continuation of the features of the evolution of the industrial structure in recent years. In addition, the abolishing of the multi-fiber agreement (MFA) for the WTO transitional period will stimulate an expansion of the textile and clothing sector. Compared with 2010, the proportion of the secondary industry will decline slightly in 2020, mainly manifested in the declining proportions of the mining and low-tech industries. As energy demand will further expand, the proportion of the energy sector will rise further. Because of the preference of technological advance for the

[③] The proportions of industrial structure we mentioned here are worked out on the basis of the existing statistical standards and parameters and the proportions of industrial structure of the base year as reflected in the 2000 input and output sheet.

intermediary demand, the proportions of electronic communications and other high-tech sectors will rise further. As the personal consumption demand for the service industry will constantly rise and as the rapid industrial development will spur the demand for productive service industries, the proportion of the service industry as a whole will rise slightly during the 11th Five-Year Plan and through to 2020.

Along with the adjustment of the industrial structure, the employment structure will also undergo drastic adjustment. The main manifestation is that labor flow will be fast during the 11th Five-Year Plan and through to 2020. The employment proportion of the primary industry will drop to 41.0 percent by the end of the 11th Five-Year Plan and further to 34.2 percent by 2020. That will be nearly 15 percentage points lower than the 2000 level. The proportion of secondary industry will rise slightly during the 11th Five-Year Plan, thanks to the rapid development of the textile and clothing industries. During the 2010-2020 period, however, the employment proportion of the secondary industry will fall slightly due to the lower GDP proportion of the secondary industry and the higher capital/labor ratio. Compared with the secondary industry, the service industry has a stronger capacity for labor absorption, whose employment proportion will reach 43.4 percent by 2020.

Because of the impact of WTO accession and the upgrading of industrial structure, the structure of import and export will also change slightly. As the WTO transition period will end during the 11th Five-Year Plan, the reduced tariffs on farm products and the introduction of the tariff quota system will reduce the proportion of the export of the agricultural sector and the increase that of its import. The reduced tariffs on industrial goods and the abolition of the MFA against China④ will constantly push up the

④ According to WTO agreement, the MFA will be completely abolished in 2005.

proportion of the export of the textile and clothing industries. In the meantime, the export competitiveness of the capital- and technology-intensive industries will be stronger thanks to the fast rise in the capital/labor ratio and in human capital. Therefore, electronic communications and other products will see their export proportions rise further. In the long run, the relative scarcity of land and other resources and the continuous rise in the prices of farm products will persistently increase the cost of the textile and clothing sectors and the sectors that are directly related to farm products and reduce the export proportions. By 2020, electronic communications, textiles, clothing, chemical and electric equipment will be the leading export sectors.

3.2. Coordinated development scenario

Table 3 shows the state of the economic growth during the 2000-2020 period in the coordinated development scenario. For all periods, the economic growth rate in the coordinated development scenario will be higher than in the base scenario. The GDP growth rate will be 0.4 percentage points higher than in the base scenario during the 11th five-year plan, expected to reach 8.5 percent. The rate is expected to be 8.2 percent and 7.7 percent for the 2010-2015 period and the 2015-2020 period.

Table 3 Economic Growth & its Sources for 2000-2020 (%, coordinated development scenario)

	2000-2005	2005-2010	2010-2015	2015-2020	2000-2020	2005-2020
GDP	8.7	8.5	8.2	7.7	8.3	8.1
Sources of growth						
Labor	0.5	0.4	0.2	0.0	0.3	0.2
Capital	6.4	5.6	5.1	4.7	5.4	5.1
TFP	1.8	2.5	2.9	2.9	2.5	2.8

In terms of the sources of economic growth, rapid capital accumulation will still be the main driving force for China's rapid economic growth in this scenario. But the contribution of capital to economic growth will be smaller than in the base scenario. However, the contribution of the TFP will be higher than in the base scenario. This, in a sense, conforms more to the requirements of sustainable development, because on the one hand capital accumulation cannot maintain a sustained rapid growth for a long time due to various constraints and on the other the rate of marginal income for capital will decline with the deepening of capital.

In the coordinated development scenario, the service industry will post a rapid development thanks to the reform of its rules and systems and will play increasingly important roles in production and in boosting industrial competitiveness. This in turn will provide more development opportunities for the service industry and especially the modern service industry that serves production. For this reason, the efficiency of the service sectors will rise faster and rapidly increase the proportion of the service industry in the whole economy. The structure of the primary, secondary and tertiary industries will be 10.5:52.5:37.0 at the end of the 11th Five-Year Plan and 6.4:49.9:43.6 by the year 2020. The GDP proportion of the service industry in 2020 will be three percentage points higher than in the base scenario. With the deepening of marketization, the situation in which the current prices of resources (energy) fail to reflect their rarity will change and the price system will be more rational. As a result, the efficiency of resource (energy) utilization will be higher and the development of the energy-consuming and polluting sectors will face restrictions. These factors will make the development of the energy sector and the energy-consuming and polluting sectors become slower than in the base scenario. Meanwhile, the development of some high-tech industries such as electronic communications will be faster than in the base scenario.

In order to reflect the impact of economic development on the environment in the above two scenarios, we simulated the discharge of four major pollutants, namely SO_2, NOx, TSS and soot, in different scenarios. Table 4 shows the changes in pollutant discharges for both the coordinated development scenario and the base scenario, which indicate that the discharge of all four major pollutants will be lower than in the base scenario. In particular, the discharge of SO_2 and NOx will post greater changes. These two pollutants are mainly related to energy inputs. With the adjustment of the industrial structure and the enhancement of energy utilization efficiency, the discharge of these two pollutants in 2020 will be more than 10 percent lower than in the base scenario. Overall, the coordinated development scenario will see a faster economic growth and a lesser environmental pollution when compared with the base scenario.

Table 4 Pollutant Discharge in Coordinated Development Scenario

	2010	2020
NO2	-4.5	-11.1
NOx	-3.4	-12.9
TSS	-2.5	-6.6
Soot	-5.5	-8.3

Note: The data in the table indicate the percentage changes in pollutant discharge in the coordinated development scenario when compared with the base scenario.

3.3. Risk scenario

Table 5 shows the economic growth in the risk scenario from 2000 to 2020. During the 11th five-year plan, the GDP growth rate will be 7.5 percent or 0.6 percentage points lower than in the base scenario. The economic growth rate is expected to be 5.8 percent and 4.8 percent respectively for the 2010-2015 and 2015-2020 periods. The economic growth rate in the risk scenario will all be tangibly lower than in the base scenario. This is a fairly pessimistic scenario.

Table 5 Economic Growth & its Sources from 2000 to 2020 (%, risk scenario)

	2000-2005	2005-2010	2010-2015	2015-2020	2000-2020	2005-2020
GDP	8.7	7.5	5.8	4.8	6.7	6.0
Sources of growth						
Labor	0.5	0.4	0.2	0.0	0.3	0.2
Capital	6.4	5.5	4.2	3.3	4.8	4.3
TFP	1.8	1.6	1.4	1.5	1.6	1.5

4. Conclusions

From the analysis of the above scenarios we can draw the following conclusions:

1. The economy will continue to maintain a rapid growth during the 11th Five-Year Plan, at an average annual growth rate of about 8 percent. At 2000 constant prices, the aggregate GDP at the end of 11th Five-Year Plan will reach 2.4 trillion U.S. dollars, which will be larger than that of Germany in 2000. The per capita GDP will be about 1,700 U.S. dollars.[⑤] Compared with the 11th Five-Year Plan, the economic growth during the 2010-2020 period will be slightly slower, with an average annual growth rate of about seven percent. By the year 2020, the aggregate GDP will be about 4.8

[⑤] According to the World Bank data, the countries with a per capita GDP of 1660-2000 dollars in 2000 were Russia (1,660 dollars), Romania (1670 dollars), Jordan (1680 dollars), Guatemala (1690 dollars), Macedonia (1710 dollars), Salvador (1990 dollars) and Thailand (2010 dollars).

trillion U.S. dollars, surpassing that of Japan in 2000. The per capita GDP will be about 3,200 U.S. dollars.⑥

2. The most important driving force of the rapid economic growth during the 11th Five-Year Plan and the 2010-2020 period will continue to be a rapid capital accumulation, whose contribution rate will be 63.5 percent in the coordinated development scenario, 67.4 percent in the base scenario and 72.1 percent in the risk scenario. At the same time, the model simulation results also indicate that the contribution to the economic growth by the TFP growth arising from urbanization, human capital investment, economic restructuring and technological innovation will be increasingly greater. This contribution rate during the 2015-2020 period will be 10-15 percentage points higher than during the 10th Five-Year Plan. The TFP growth will be a key to a sustained and rapid economic growth in the future.

3. The industrial structure will continue to be adjusted and become more rational thanks to deepening industrialization and urbanization during the 11th Five-Year Plan and the 2010-2020 period. The main changes in industrial structure during the 11th Five-Year Plan will be that the proportion of the primary industry will continue to decline and those of the secondary and tertiary industries will rise slightly. At the end of the 11th Five-Year Plan, the proportions of the primary, secondary and tertiary industries could be 10.8:54.2:35.1. During the 2010-2020 period, the main changes in industrial structure will be higher efficiency and greater proportion of the service industry. The proportions of the primary, secondary and tertiary industries will be 7.3:52.5:40.2.

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⑥ According to the World Bank data, the countries with a per capita GDP of about 3200 dollars in 2000 were Turkey (3090 dollars), Panama (3260 dollars), Botswana (3300 dollars), Malaysia (3380 dollars), Estonia (3410 dollars) and Brazil (3570 dollars).

4. The simulation results indicate that if the national economy can post a coordinated and sustainable development, the damage of economic growth to the environment will be much smaller. Take 2020 for example. The discharge of the four major pollutants in the coordinated development scenario will be 7-13 percent lower than in the base scenario.

5. What is noteworthy is that in the next 10-15 years, China still faces a possible slowdown in its economic growth. For example, the negative impact of trade frictions on import and export, the lower rate of savings, the slower rate of capital accumulation and the higher system costs arising from system contradictions could reduce China's economic growth rate to about 6 percent.