China in 2020

A New Type of Superpower

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June 15, 2011 Washington DC

Questions to be addressed

- Is China really rising?
- Can China attain a sustainable position as an economic powerhouse for the years and decades ahead?
- How might this be accomplished?
- What is the difference between the economy of China and developed economies such as those in Europe, the United States, and Japan?
- Will China soon emerge as the world's newest superpower?
- If so, how will this change the world's economic and political landscapes?

Agenda

- China, An Emerging Superpower
- Economic Development: Past, Present, and Future
- Demographic Challenges: An Aging Society and Rapid Urbanization
- A Healthy China: Progress and Problems
- Education and Human Resources
- Science, Technology, and Innovation
- Climate Change and Sustainable Growth
- Development Goals and Grand Strategy

China, An Emerging Superpower

- One of the great events of the past three decades has been the rapid rise of China
- China's quick ascent into the ranks of great powers not only outstripped the expectations of the international community but has also far surpassed the Chinese government's own expectations

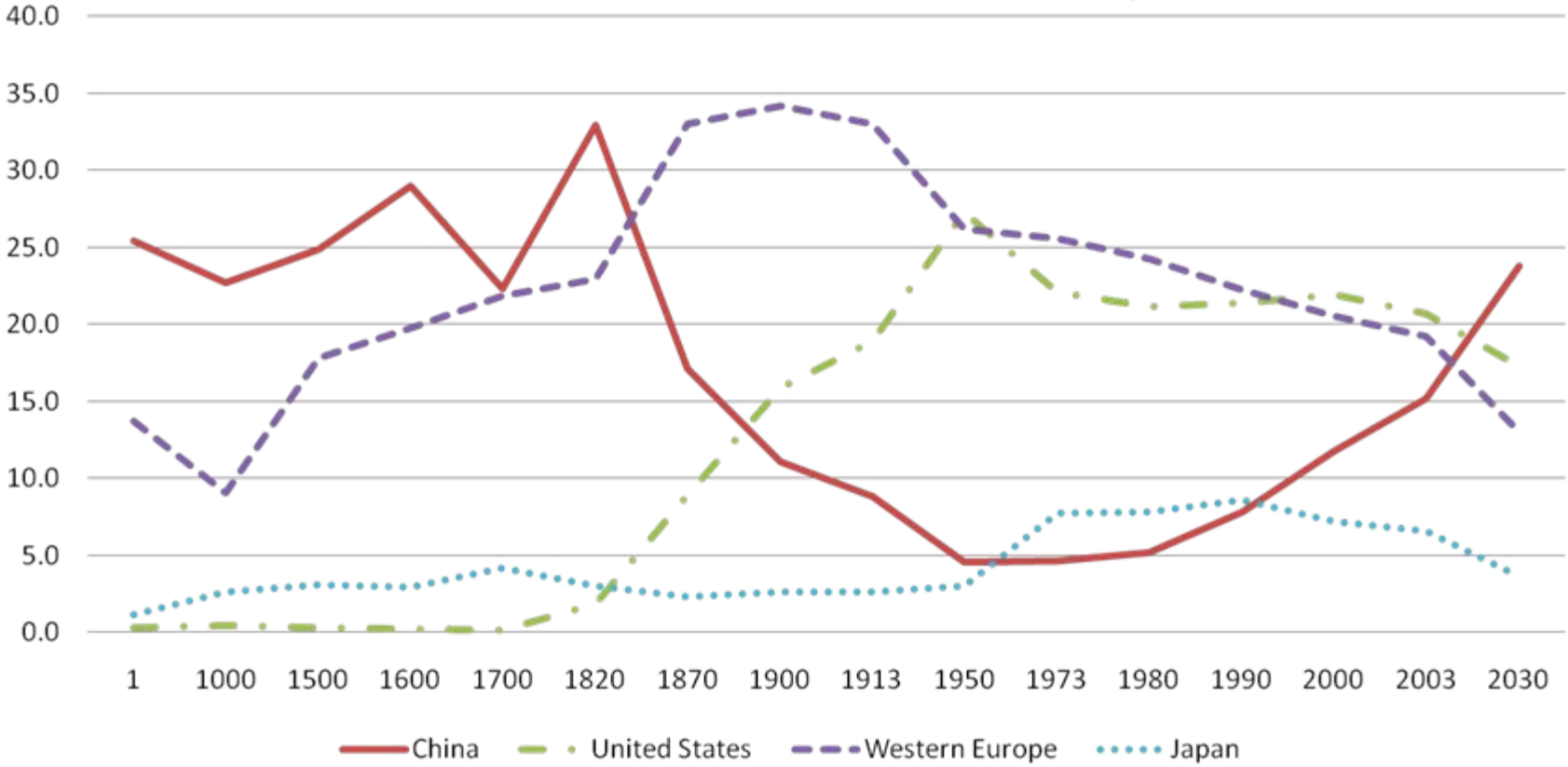
China, An Emerging Superpower

- The Rise of Modern China
  - The first stage, from 1950 to 1980, is what I term the preparation-for growth stage
  - The second stage in China's economic development, lasting from 1980 to 2020, is what I call the high-speed-growth stage
  - The third stage of development, lasting from 2020 to 2050, is what I call the steady-growth stage

China, An Emerging Superpower

China is experiencing a U curve (1820-2030)

Gross Domestic Product Shares World Total, Four Major Powers, 1–2030



Source: Angus Maddison, "Statistics on World Population, GDP, and per Capita GDP, 1–2003 AD" (www.ggdc.net/maddison/); Angus Maddison, *Chinese Economic Performance in the Long Run, 960–2030 AD* (Paris: OECD, 2007).

Economic Development: Past, Present, and Future

- Sources of Economic Growth in the PRC

Source	1952-77	Contribution	1978-2005	Contribution
GDP	6.1	100	9.6	100
Capital stock, 1987	11.5	75	9.5	39
Employment	2.6	13	2.4	8
Human capital	4.1	20	2.1	7
Total factor productivity	-0.5	-8	4.4	46

Source: Hu Angang and Taoxiong Liu, "Comparison of Defense Capital Power among China, U.S., Japan, and India," *Strategy and Management* 6 (2003); Chang Li, "Study of Regional Gaps in Human Capital and Economic Development" (master's thesis, Tsinghua University); *Chinese Labor Statistical Yearbook 2000; China Statistical Abstract 2004,* pp. 38–42.

Economic Development: Past, Present, and Future

- China's Potential for Further Economic Growth
  - International and domestic catch-up effect
  - High domestic savings and high investment rates
  - Expected increase in human capital
  - Growth of the nonagricultural sector
  - Steady increases in total factor productivity

Economic Development: Past, Present, and Future

- How will China catch up with the United States in total GDP (2010 estimation)
  - Physical quantity: China has also overtaken the United States in terms of output of major manufactured goods
  - Market exchange: by 2020 America's GDP will be between 2.35 and 2.70 times that of China and by 2035, 1.06–1.32 times that of China
  - The PPP method
- China overtaking the United States in terms of GDP, regardless of how it is calculated, is inevitable

Economic Development: Past, Present, and Future

GDP and the Added Values of Three Economic Sectors, China and the United States

	1980	1990	2000	2005	2007
China GDP (percent of world total)	1.04	1.85	3.77	5.20	5.87
U.S. GDP (percent of world total)	29.06	29.40	30.75	30.39	25.19
U.S./China ratio	28.03/1.00	15.87/1.00	8.15/1.00	5.85/1.00	4.29/1.00
China agricultural output (percent of world total)	9.45	12.97	15.54	16.97	21.53
U.S. agricultural output (percent of world total)	6.93	7.58	9.80	8.70	8.40
U.S./China ratio	0.73/1.00	0.58/1.00	0.63/1.00	0.51/1.00	0.39/1.00
China industrial output (percent of world total)	1.16	2.22	6.30	9.00	10.28
U.S. industrial output (percent of world total)	24.24	23.21	25.16	23.88	19.79
U.S./China ratio	10.33/1.00	5.41/1.00	1.91/1.00	1.33/1.00	1.93/1.00
China service industry output (percent of world total)	0.53	1.23	2.39	3.02	3.40
U.S. service industry output (percent of world total)	34.89	34.06	34.50	33.91	28.11
U.S./China ratio	65.29/1.00	27.65/1.00	14.43/1.00	11.22/1.00	8.27/1.00

Source: World Bank, *World Development Indicators 2010;* World Bank, *World Development Report 2009.*

Economic development

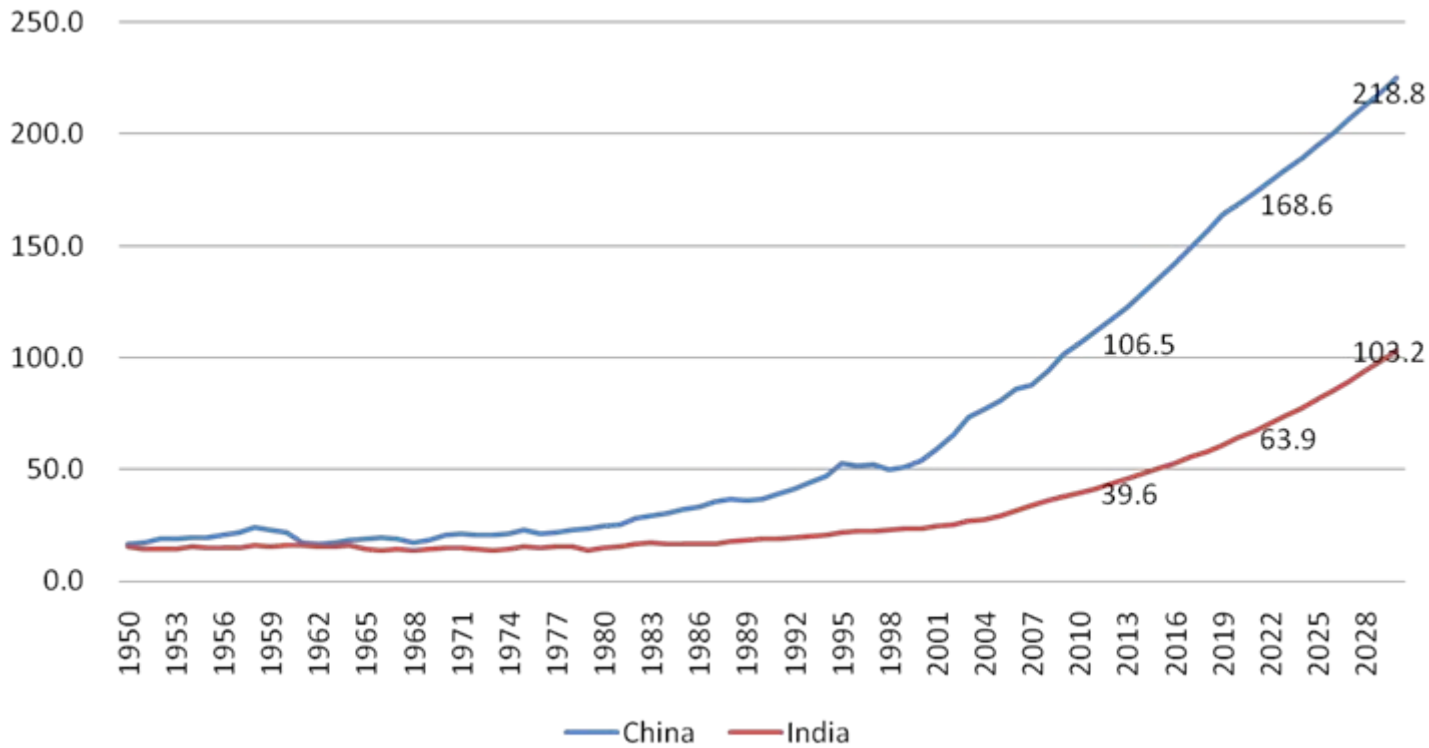
- China creates 50 years economic growth gold age (1978-2030 , 2011 estimation)

Growth index in China (1978=1.00)

	1978	2010	2020	2030	1978-2010 Annual growth (%)	2010-2030 Annual growth (%)	1978-2030 Annual growth (%)
GDP	1.00	20.57	44.4	87.4	9.9	7.5	9.0
GDP per capita	1.00	14.71	30.3	62.5	8.8	7.0	8.3

Economic development

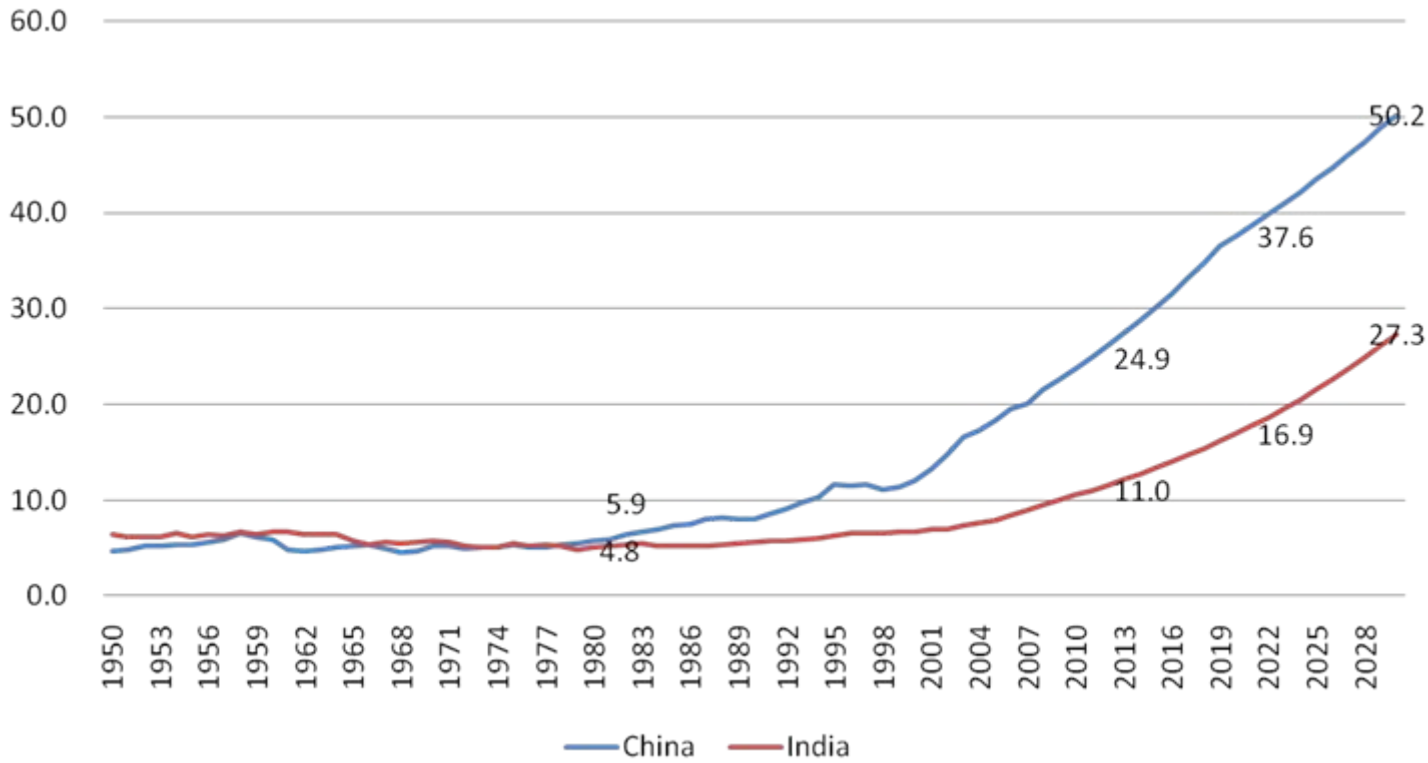
- Catch-up index of GDP (US=100 , 2011 estimation)



Note: Growth rate for China is 7% during 2010 to 2020, and 5% for 2020 to 2030, for US is 2% and for India is 7%.
Data source: Maddison, 2010.

Economic development

- Catch-up index of GDP per capita (US=100 , 2011 estimation)



Note: Growth rate for China is 7% during 2010 to 2020, and 5% for 2020 to 2030, for US is 2% and for India is 7%.
Data source: Maddison, 2010.

Economic development

- GDP gap among China, US and Japan (exchange rate, trillion USD, 2011 estimation)

	2000	2005	2010	2015	2020
China	1.198	2.257	5.879	13.085	27.807
US	9.849	12.580	14.660	17.411	20.679
Japan	4.667	4.552	5.474	5.897	6.353
US/China	8.22	5.57	2.49	1.33	0.74
Japan/China	3.90	2.02	0.93	0.45	0.23

Note: GDP growth rate for China is 8.5 from 2010 to 2020 and 7.5 from 2020 to 2030, GDP growth rate for US is 3.5% and for Japan is 1.5% with considerations of GDP deflator. GDP deflator for China is 4% and annual RMB appreciation rate is 4%.
Data source: World Development Indicator 2010, CIA World Factbook.

Demographic Challenges

- The PRC's rapid demographic transition
  - Modern demographic transition, 1949–78
  - An aging society: fewer children and more seniors, 1978-present
- Therefore, we need to adjust population control policies

Demographic Challenges

- Urbanization: the main driving force of future development

Urban Population Growth, China, the World, and the United States, 1950–2030

Period	China	World	United States
1950-1980	3.85	2.91	1.75
1980-2000	4.47	2.50	1.41
2000-2030	2.19	1.86	1.16
1960-1970	0.99	2.94	1.73
1950-2030	3.38	1.44	1.44

Source: UN Department of Economic and Social Affairs, *World Urbanization Prospects: The 2008 Revision.*

Demographic Challenges

Urbanization, China and the United States, 1950–2030 (2010 estimation)

Year	Urban population (million)			Urbanization rate (percent)			Share of world urban population (percent)	
	China	United States	Ratio	China	United States	Gap	China	United States
1950	61.7	101.2	0.61	11.2	64.2	53.0	8.37	13.74
1960	130.7	130.3	1.00	19.7	70.0	50.3	13.12	13.08
1970	144.2	154.6	0.93	17.4	73.6	56.2	10.83	11.61
1980	191.4	170.3	1.12	19.4	73.7	54.3	11.00	9.78
1990	302.0	192.8	1.57	26.4	75.3	48.9	13.28	8.48
2000	459.1	225.3	2.04	36.2	79.1	42.9	16.09	7.90
2010	607.2	259.0	2.34	47.0	82.3	35.3	17.38	7.41
2020	756.3	290.7	2.60	54.0	84.9	30.9	17.97	6.91
2030	879.9	318.5	2.76	60.0	87.0	27.0	17.72	6.41

Source: National Bureau of Statistics of China, *Statistical Data of the 55 Years of New China* (2004); UN Department of Economic and Social Affairs, *World Urbanization Prospects: The 2008 Revision;* author's calculations.

Urbanization

- The world is more and more urbanized (2011 estimation)

Urbanization, China and the United States, 1950–2030

Year	Urban population (million)			Urbanization rate (%)			Share of world urban population (%)	
	China	US	China/US	China	US	Gap	China	US
1950	61.7	101.2	0.61	11.2	64.2	53.0	8.37	13.74
1960	130.7	130.3	1.00	19.7	70.0	50.3	13.12	13.08
1970	144.2	154.6	0.93	17.4	73.6	56.2	10.83	11.61
1980	191.4	170.3	1.12	19.4	73.7	54.3	11.00	9.78
1990	302.0	192.8	1.57	26.4	75.3	48.9	13.28	8.48
2000	459.1	225.3	2.04	36.2	79.1	42.9	16.09	7.90
2010	**665.6**	259.0	**2.57**	**49.7**	82.3	**32.6**	**19.05**	7.41
2020	**845.0**	290.7	**2.91**	**60.0**	84.9	**24.9**	**21.00**	6.91
2030	**1020.0**	318.5	**3.20**	**70.0**	87.0	**17.0**	**22.90**	6.41

Note: 2020 and 2030 data is estimated by author, annual growth rate from 2010-2030 is 2.15%, 1978-2010 is 4.3%.
Source: National Bureau of Statistics of China, *Bulletin on Census 2010*; UN Department of Economic and Social Affairs, *World Urbanization Prospects: The 2008 Revision; a*uthor's calculations.

A Healthy China

- Building a healthy China by 2020
  - Reducing by half, between 1990 and 2015, the proportion of people whose income is less than a dollar a day.
  - Reducing by half, between 1990 and 2015, the proportion of the population without access to safe drinking water and basic sanitation
  - Reducing by three-quarters, between 2000 and 2020, the mortality rate of pregnant women.
  - Reducing by two-thirds, between 1990 and 2015, the mortality rate of children under five
  - Reducing by half, between 2000 and 2020, the infant mortality rate

A Healthy China

Millennium Development Goals, China and Other Countries, 2007

Goal	High-income countries	Upper-middle income countries	China	China's 2020 goal
Health resources per thousand persons				
Number of doctors	2.7	2.2	1.4	2.0
Hospital beds	5.9	4.2	2.2	4.0
Public health and basic medical services (percent)				
Children immunized against measles	93	94	94	98
Prenatal medical checkup coverage	n.a.	93	90	95
Rural population's access to safe drinking water	98	84	81	90
Use of sanitary latrines in rural areas	99	61	59	80
Funds raised for equalizing health services (percent)				
Urban medical insurance coverage	n.a.	n.a.	50	100
Rural medical insurance coverage	n.a.	n.a.	99	100
Government spending on health as share of total spending	17	10	4	8

Source: UN in China, *China's Progress toward the Millennium Development Goals, 2008 Report;* Hu Angang, *China in 2020: Building up a Well-Off Society* (Tsinghua University Press, 2007).

A Healthy China

- Human Development Index and China's goal of building a well-Off society

Indexes of Human Development, Life Expectancy, Education, and GDP, China, 1950–2020

Year	Human development index	Life expectancy index	Education index	GDP index
1950	0.225	n.a.	n.a.	n.a.
1975	0.523	n.a.	n.a.	n.a.
1980	0.559	0.674	0.641	0.361
1985	0.595	0.686	0.663	0.435
1990	0.634	0.712	0.711	0.481
1995	0.691	0.742	0.758	0.571
2000	0.732	0.771	0.791	0.633
2005	0.777	0.792	0.837	0.703
2008	0.793	0.799	0.851	0.665
2010	0.800	n.a.	n.a.	n.a.
2020	0.870	n.a.	n.a.	n.a.

Source: Nicholas Crafts, "The Human Development Index, 1870–1999," *European Review of Economic History* 6, no. 3 (2002): 395–405; UN Development Program, *Human Development Report 2002,* p. 246; *China Human Development Report 2007/08; China Human Development Report 2009/10;* author's estimates.

Education and Human Resources

- Becoming a human resources power, 1978–2000, 2010 estimation

Average Years of Education Received by People Aged Fifteen and Over, China and Other Countries, Selected Years, 1960–2000

Year	China	Developing countries	Developed countries	World
1960	2.0	1.79	7.06	4.61
1970	3.5	2.30	7.56	5.08
1980	5.0	3.08	8.86	5.77
1990	6.43	3.97	9.19	6.43
2000	7.85	4.48	9.76	6.72

Source: Robert J. Barro and Jong-Wha Lee, "International Data on Educational Attainment: Updates and Implications," *Oxford Economic Papers* 53, no. 3 (2001): 541–63; author's calculations.

Human capital

- Average education years for 15-64 population in selected countries (2011 estimation)

Year	China	US	Developed countries	World	China/US (%)
1950	1.00	8.38	6.22	3.17	11.9
1960	2.00	9.15	6.81	3.65	21.9
1970	3.20	10.77	7.74	4.45	29.7
1980	5.33	12.03	8.82	5.29	44.3
1990	6.43	12.14	9.56	6.09	53.0
2000	7.85	12.71	10.65	6.98	61.8
2010	**9.00**	12.20	11.03	7.76	73.8
2020	**10.00**				
2030	**11.00**	**13.00**			**85.0**

Note: 2020 and 2030 data is estimated by author.
Source: Robert J. Barro and Jong-Wha Lee, "International Data on Educational Attainment: Updates and Implications," Oxford Economic Papers 53, no. 3 (2001): 541–63; author's calculations.

Education and Human Resources

- Becoming a global human resources power, 2001–20

Total Human Capital, China, Selected Years, 1950–2020

Item	1950	1960	1982	1990	2005	2020
Population aged 15-64 (million)	337.8	363.0	625.2	762.6	888.0	996.0
Share of total (percent)	62.0	56.3	61.5	66.7	70.2	69.6
Average years of education	1.0	2.0	5.3	6.4	8.5	10.0
Human capital People (billion·year)	0.3	0.7	3.3	4.9	7.5	10.0
Share of world total (percent)	5.5	9.0	21.1	23.6	25.8	25.2

Source: UN Department of Economic and Social Affairs, *World Population Prospects: The 2008 Revision;* National Bureau of Statistics of China, "Statistical Data of the 55 Years of New China," *China Statistical Yearbook 2006;* author's calculations.

Education and Human Resources

- How should China become the world's leading human resources power?
  - It is imperative that the state accelerate the popularization of preschool education, aiming to raise enrollment in kindergartens to over 75 percent by 2020
  - It is essential to improve the quality of teachers
  - Equality in education should be made the most important policy goal
  - The educational system must be reformed, and a premium must be placed on institutional innovation
  - Both international and domestic education resources should be fully employed
  - An investment system should be established in which the government is the main investor and social organizations provide supplementary support

Science, Technology, and Innovation

- Measurement of science & technology power
  - The first capacity is the country's innovative capacity in science
  - The second capacity is innovative capacity as regards technology
  - The third capacity is the country's capacity to use new technologies
  - The fourth capacity is the capacity of a country to use global information
  - The fifth capacity is the capacity of a country to invest in R&D, measured by the country's R&D expenditures (purchasing power parity, or PPP)

Science, Technology, and Innovation

Science and Technology Power Shares World Total, 1980–2007
2010 estimation

Country	1980	1985	1990	1995	2000	2004	2007
China	0.81	1.16	0.82	1.33	3.97	7.21	9.70
Japan	16.54	20.76	15.24	15.85	16.31	14.50	14.57
Germany	6.88	5.71	5.41	5.39	6.10	5.26	5.22
United Kingdom	5.95	5.38	4.27	4.29	4.35	4.04	4.06
United States	25.93	25.32	39.13	34.92	28.59	24.50	23.24
Total	**56.11**	**58.33**	**64.87**	**61.78**	**59.32**	**55.51**	**56.79**
USA/China gap	32.01	21.83	47.72	26.22	7.20	3.40	2.40
Japan/China gap	20.42	17.90	18.59	11.90	4.11	2.01	1.50

Science, technology and innovation

- Five major indicators are used to measure science, technology and innovation power, and China will be of course a superpower by 2030 (2011 estimation)

Measurements of science and technology power

Dimension		Indicator	Period	Weight	Data source
Input	Human resource	Scientists & engineers engaged in R&D	95-07	1/5	UNESCO
	Investment capacity	R&D expenditure	80-09	1/5	OECD
Output	Science innovation capacity	International paper	80-09	1/5	Web of Science
	Technology innovation capacity	Patent applicant filed by resident	80-08	1/5	WIPO
	Market capacity	High tech product export	80-08	1/5	World Bank

Science, technology and innovation

- Science and Technology power share world total (%, 1980–2009, 2011 estimation)

	1980	1985	1990	1995	2000	2005	2009*
China	3.8	4.3	4.9	6.6	7.9	12.3	17.4
US	24.4	23.4	24.1	22.5	21.3	19.7	20.4
EU	24.2	21.7	22.1	21.1	19.6	18.3	19.7
Japan	14.3	17.8	18.7	18.7	16.4	13.7	12.4
USSR or Russia	11.4	9.8	6.9	3.8	3.2	2.7	3.0
US/China (times)	6.4	5.4	4.9	3.4	2.7	1.6	1.2

Note: USSR, 1980-1985; Russia, 1990-2009.

Science, Technology, and Innovation

- Driving forces of China's rise in science and technology
  - Economic and S&T globalization
  - The business sector
  - Government guidance and promotion
  - Sustained high-speed economic growth
  - China 2020: an innovative country

Climate Change and Sustainable Growth

- China: worst victim of climate change
  - Natural disasters since ancient times
  - Meteorological disasters
  - Natural disasters and agricultural losses
  - Natural disasters and economic loss

Direct Economic Losses Caused by Natural Disasters and their Proportion of GDP, 1990–2008

Year	Economic loss (billion yuan)	Proportion in GDP of the year (%)	Proportion in added GDP of the year (%)
1990	66.6	3.6	40.6
1991 (flood)	121.5	5.6	39.6
1992	85.4	3.2	17.0
1993	99.3	2.9	12.4
1994	187.6	4.0	15.5
1998 (flood)	300.7	3.8	62.9
2003 (SARS)	148.2	1.1	10.9
2005	204.2	1.11	10.9
2006	252.8	1.21	10.9
2007	236.2	0.96	8.1
2008	1175.2	3.91	47.3

Source: National Bureau of Statistics of China, Ministry of Civil Affairs, *Report of the Damage Caused by Disaster in China: 1949–1995* (1995), pp. 403–07; National Bureau of Statistics of China, *Statistical Bulletin on Economic and Social Development;* author's calculations.

Climate Change and Sustainable Growth

- China: A Superpower in Greenhouse Gas Emissions

CO2 Emissions Share World Total, Six Major Economies, Selected Years, 1960–2030

Unit: %	1960	1970	1980	1990	2005	2015	2030
China	8.98	5.65	8.08	11.29	19.16	25.34	27.32
EU	15.87	15.09	13.59	10.96	14.82	11.77	9.97
USA	33.68	31.18	25.32	22.67	21.75	19.76	16.44
Japan	2.47	4.96	4.71	4.76	4.55	3.79	2.82
Russia				9.26	5.74	5.28	4.71
India	1.28	1.30	1.79	3.01	4.14	5.28	7.88
Total					70.16	71.23	69.14
EU/China (Times)	1.77	2.67	1.68	0.97	0.77	0.46	0.36
USA/China (Times)	3.75	5.52	3.13	2.01	1.14	0.78	0.60

Source: World Bank, *World Development Indicators 2006;* International Energy Agency, *World Energy Outlook 2007.*

Climate Change and Sustainable Growth

- China's roadmap for tackling climate change
  - Breaking the stalemate and working together to reduce emissions
  - Climate change policy objectives for 2020
    - Energy conservation: reduce per capita GDP energy consumption by 20 percent every five years, with the 2006–20 cumulative reduction equaling 50–80 percent
    - Emissions reduction: reduce discharges of major pollutants by 10 percent every five years, with the 2006–20 cumulative reduction of SO_2 equaling 30–40 percent and of CO_2 equaling 50 percent
    - Innovative green technologies: become a collaborator, a leader, and a user
    - Green energy market: become the world's largest wind power and solar power market, become a producer and exporter of new energy technologies and equipment, and increase the use of clean energy to 20 percent of all energy consumed
    - Green ecology: build the world's biggest artificial forest carbon sink and the world's largest green screens (shelter belts in the northeast, the north, the northwest, and the southeast coast)
  - Other Policies Associated with Climate Change

Development Goals and Grand Strategy

- Basic principles and methods for goal design
  - People-centered scientific development
  - Modern socialist development
  - Millennium development goals
  - Long-term development goals

Development Goals and Grand Strategy

- Socialist Modernization by 2020
  - Economic growth and structural Goals
  - Common prosperity goals
  - Sustainable development goals
  - Social harmony and stability goals
  - Democracy and rule of law goals
  - Building a strong, modern, socialist country

Development Goals and Grand Strategy

Major Indicators of Top Priority for 2020

Indicator	Unit	Nature	2000	2005	2010	2020
Economic Growth and Economic Structure (4)						
GDP Growth	%	Expectant	8.6	9.5	11.1	7.5
Urban New Employment	Million	Mandatory	41.1	41.8	45	100
Transferred Rural Labor	Million	Mandatory		40	45	120
Urbanization	%	Expectant	36.2	43	47	>55
Resources and Environment (7)						
Reduction of Unit GDP Energy Consumption	%	Mandatory			20	20
Ratio of Renewable	%	Mandatory		5	10	17
Energy Consumption %						
Reduction of Unit GDP CO2 Emission	%	Mandatory				-20
Cultivated Land	Million	Mandatory	1.32	1.22	1.2	1. 18
Unit GDP Water Consumption	M3/10,000 yuan	Mandatory	515	407	255	117
Forest Cover	%	Mandatory	16.55	18.2	>20	23.4
Major Pollutants	%	Mandatory			-10	(15-20)
Science, Technology and Education (4)						
Patent Grants	10,000	Expectant	9.52	17. 16	30	80
Average Year of education	Year	expectant		8.5	9	>10
Gross Enrolment of Junior Secondary	%	Mandatory	88.6	95	97	99
Rural Compulsory Education	%	Mandatory			100	100

Development Goals and Grand Strategy

Major Indicators of Top Priority for 2020

Indicator	Unit	Nature	2000	2005	2010	2020
Poverty Reduction and Public Service (3)						
Rural Poverty and Low Income People	Million	Mandatory		14900	6000	>500
Rural People Drinking Unsafe Water	Million	Mandatory		300	60	>0. 2
Children Planned Immunization	%	Mandatory	85.3	87	>95	100
People's Life (4)						
Mean Life Expectancy	Year	Expectant	71.4	72	74.5	77
Urban Disposable Income Growth	%	Expectant	5.7	9.7	9.3	5
Rural Disposable Income Growth	%	Expectant	4.7	5.3	9.7	5
HDI	%	Expectant	0.73	0.76	0.80	0.88
Harmonious Society (4)						
Public Order Case	1/100,000	Mandatory	469	750	700	600
Urban Medical Insurance Coverage	%	Mandatory	31	50	>60	100
Urban Old-Age Insurance Coverage	%	Mandatory	45	48	>55	>85
Rural Medical Insurance Coverage	%	Mandatory	3.1	23.5	100	100

China as a New Type of Superpower

- China as a new type of superpower
  - China should not be a superpower that seeks hegemony and world domination
  - China's rise has been defined by peaceful development
  - China should be a resource-efficient, environmentally friendly superpower focused on green development
  - China should be a superpower with a high human development level and a small gap between rich and poor
  - China should also be a superpower with significant soft power resources
  - China must be a mature and responsible superpower

Rethinking the China Dream

- What is the China dream? Mao Zedong said fifty years ago that in the twenty-first century China should make a greater contribution to mankind, and in contribution to Hu Jintao's even greater contribution, it is clear that China's position has changed both in comprehensive national power and in other adaptations and rational changes
- The question remains: What will be China's contribution to the world?
- Besides its enormous economic and trade contributions, as well as poverty reduction contributions, China needs to contribute in four other key areas:
  - Human development
  - Science and technology
  - Green movement
  - Culture

Rethinking the *China Dream*

- These four contributions would represent China's modern renaissance, with domestic and international significance
- Given that China has become one of the largest stakeholders in world affairs today, it is incumbent upon it not only to follow its own interests and the interests of developing countries but also to develop in a fashion consistent with the interests of developed countries