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Understanding China's Growth: Past, Present and Future

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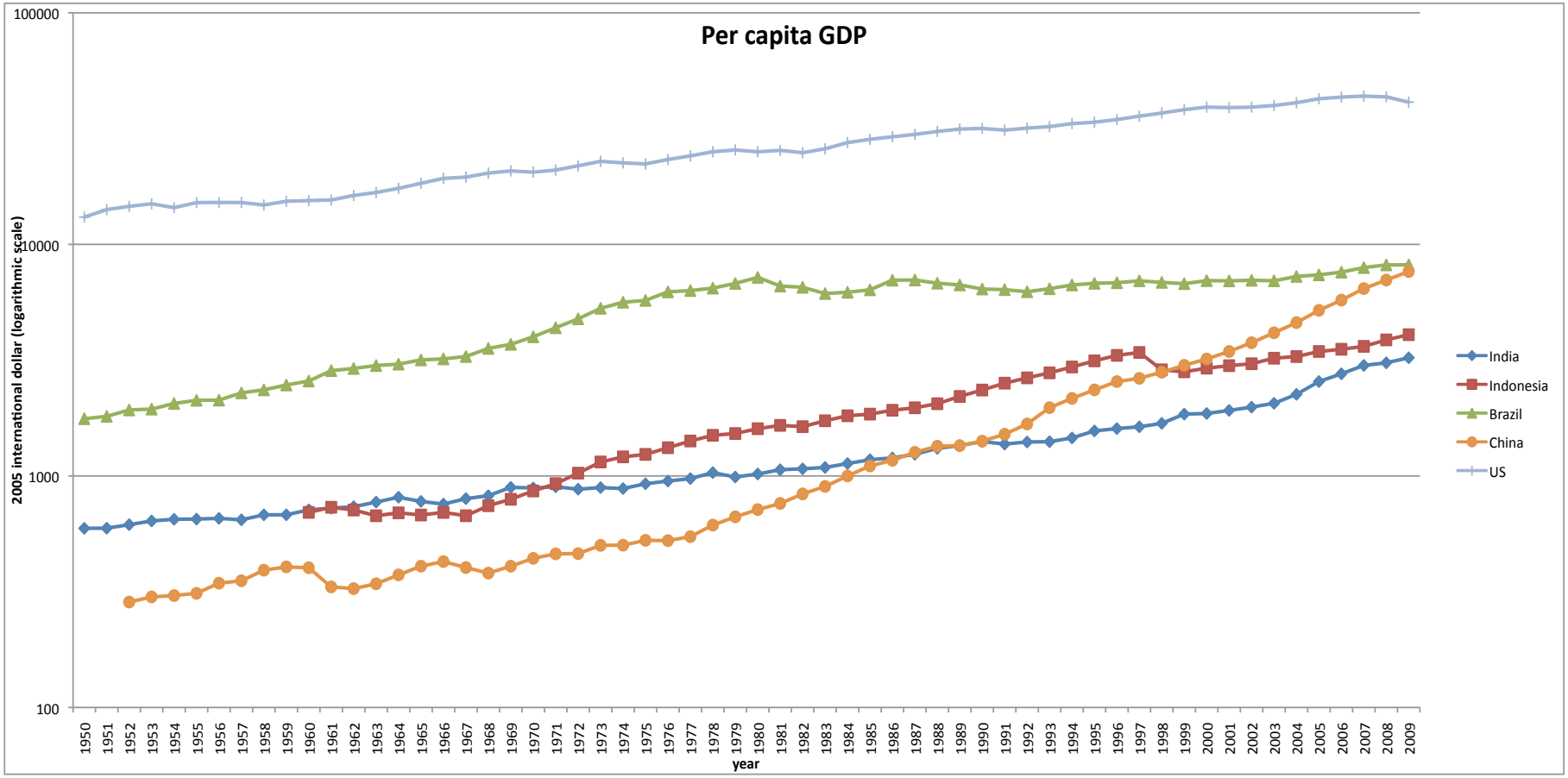
China's growth since 1978

- In 1978, per capita GDP in China was 1/40 of that in US and 1/10 of that in Brazil
- Since 1978, per capita GDP in China has grown at 8% a year on average, doubling every 9 years.
- The rapid improvement in average living standard has occurred in a country with about 20% of world's population

Per capita GDP in China and various countries



Growing importance of China in the world economy

- China's per capita GDP (PPP measure) is now 1/5 of U.S. level and at the same level as Brazil
- In total size, China is now the second-largest economy in the world
- Imports from China account for at least 10% of total imports for any region in the world

Three questions

1. What are the main sources of China's remarkable growth?

2. How long can China's rapid growth be sustained?

3. What are the main challenges China faces in sustaining high rates of growth?

I will try to answer these questions based on the results of three recent papers

- "Understanding China's Growth: Past, Present and Future", *Journal of Economic Perspectives,* Fall, 2012
- "Factor Market Distortions across Time, Space and Sectors in China", *Review of Economic Dynamics,* January, 2013
- "Accounting for China's Growth", working paper

Main conclusions

- China's growth has been driven by increases in productivity, not by investment nor by demographic factors
- There is still plenty of room for growth in China, strong growth potential in the next two decades
- However, many challenges in realizing the growth potential

Question 1

What are the main sources of China's growth since 1978?

Growth Accounting

Two methods of decomposing the sources of GDP growth:

- standard method
- alternative method based on growth theory

Aggregate Production Function

$$Y = AK^{\alpha}(hL)^{1-\alpha}$$

Y: GDP
K: Real capital stock
h: Average level of human capital
L: Size of the labor force
α: Capital income share—around 0.5 in China

Standard Growth Accounting

$$Y = AK^{\alpha}(hL)^{1-\alpha}$$

$$g_Y = g_A + \alpha g_K + (1-\alpha)\left(g_h + g_L\right)$$

g_x is the growth rate of x

Average growth rates

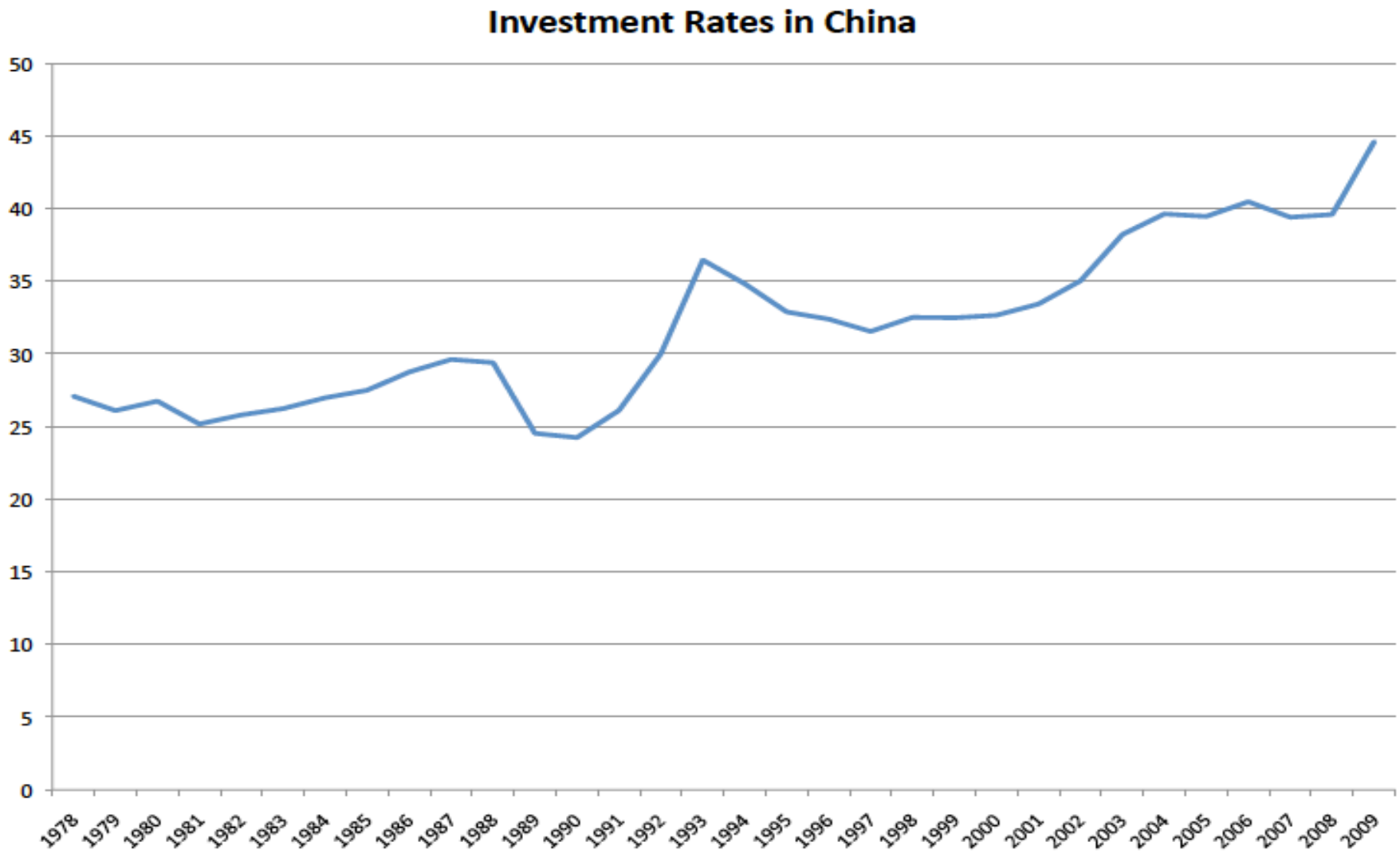
	GDP	K	h	L
1978-2009	9.48	9.02	1.27	1.64
1978-1988	9.43	7.88	1.20	2.84
1988-1998	7.75	7.74	1.77	1.27
1998-2009	11.09	11.24	0.87	0.90

Standard growth accounting

	GDP	Contributions from			
	Growth	K	h	L	TFP
1978-2009	9.48	4.51	0.63	0.82	3.51
1978-1988	9.43	3.94	0.60	1.42	3.47
1988-1998	7.75	3.87	0.88	0.63	2.37
1998-2009	11.09	5.62	0.44	0.45	4.59

Calculation made with α=0.5

Has China's growth been driven by investment?



Alternative growth decomposition

A decomposition proposed by Hall and Jones (1999), and Kehoe and Prescott (2002):

$$Y = A^{\frac{1}{1-\alpha}} hL\left(\frac{K}{Y}\right)^{\alpha}$$

In the long-run, growth of both K and Y are driven by A, h, and L, and K/Y should be a constant

K/Y may change during the transition or due to changes in investment rate

Theory-based growth accounting

$$Y = A^{\frac{1}{1-\alpha}} hL \left(\frac{K}{Y} \right)^{\frac{\alpha}{1-\alpha}}$$

$$\frac{Y}{Pop} = A^{\frac{1}{1-\alpha}} h \frac{L}{Pop} \left(\frac{K}{Y} \right)^{\frac{\alpha}{1-\alpha}}$$

$$g_Y = \frac{1}{1-\alpha} g_A + \left(g_h + g_L \right) + \frac{\alpha}{1-\alpha} g_{K/Y}$$

Accounting based on growth theory

	GDP	Contributions from			
	Growth	K/Y	h	L	TFP
1978-2009	9.48	-0.45	1.27	1.64	7.02
1978-1988	9.43	-1.55	1.20	2.84	6.94
1988-1998	7.75	-0.02	1.77	1.27	4.73
1998-2009	11.09	0.15	0.87	0.90	9.17

China's growth has not been driven by investment

- Despite rising rates of investment, returns to investment remain to be the highest in the world
- This would not be possible without high productivity growth
- High investment rates are the result of high productivity growth, not the cause of high GDP growth rates

China's modern growth before and after 1978

Figure 2

GDP per capita of China and US: 1952–2009

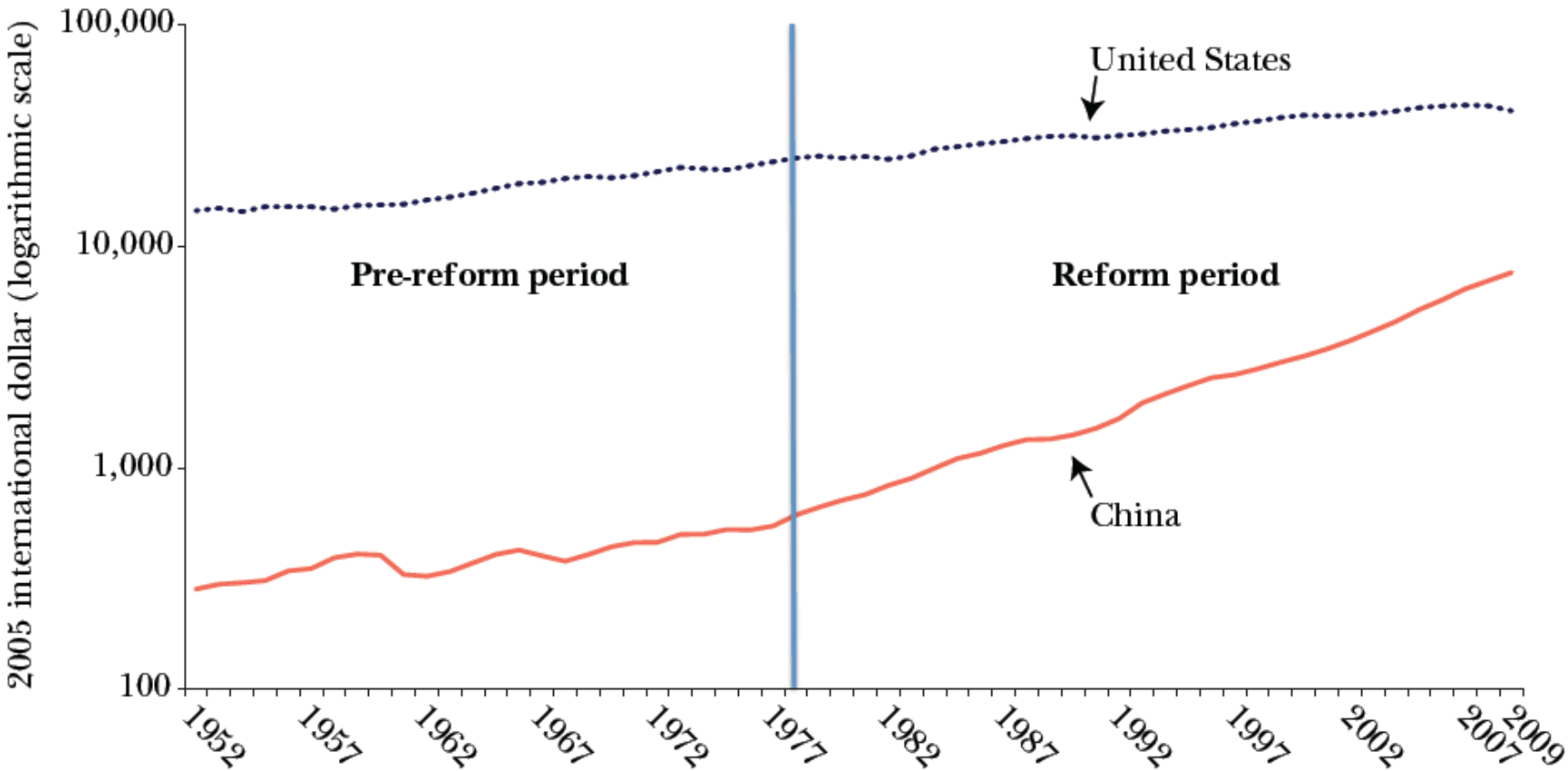


Table 1

Decomposing China's Growth: 1952–2007

	Average annual growth rates (%)				
Period	*GDP per capita*	*Labor partication rate*	*Capital/output ratio*	*Average human capital*	*TFP*
1952–1978	2.97	0.11	3.45	1.55	–1.07
1978–2007	8.12	0.57	0.04	1.18	3.16
	Contributions to per capita GDP growth				
Period	*GDP per capita*	*Labor partication rate*	*Capital/output ratio*	*Average human capital*	*TFP*
1952–1978	100	3.63	116.15	52.25	–72.03
1978–2007	100	7.05	0.51	14.55	77.89

Different growth patterns before and after 1978

- In the pre-reform period, accumulation of both physical and human capital is the main source of growth

- During the reform period, productivity growth is the main source of growth

Question 1

What are the main sources of China's growth since 1978

Answer: Productivity growth

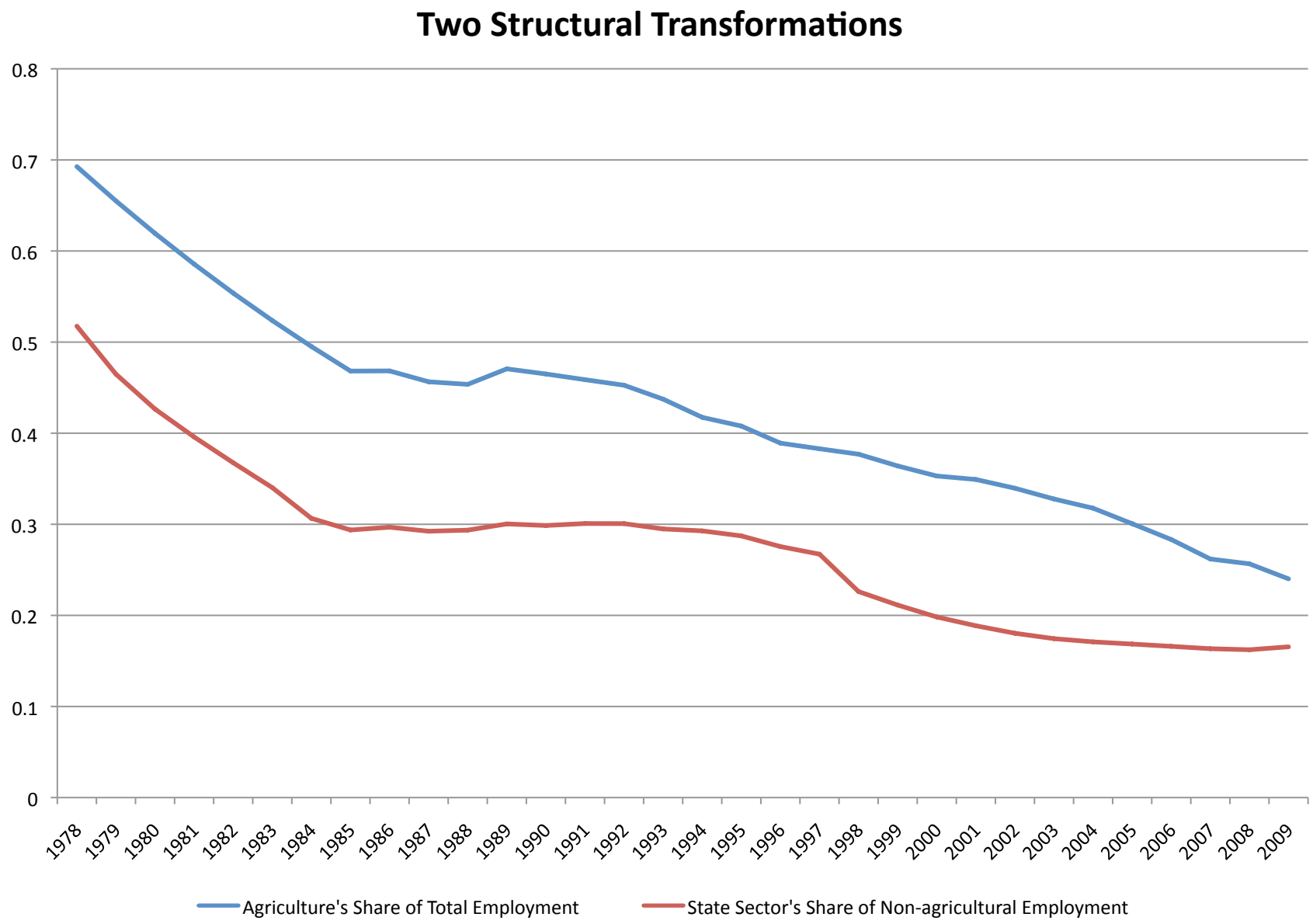
What are the sources of productivity growth since 1978?

- Technological progress?
- Policy and institutional reforms?
- Structural transformations?
  - From agriculture to manufacturing and services
  - From state sector to non-state sector

Policy and institutional reforms

- General policy of "Reform and Opening Up" (*Gaige Kaifang)* is decided in December 1978

- Agriculture:
  - Implemented Household Responsibility System and price reform in agriculture in the early 1980s
  - Further market reforms in 1990s
  - Relaxation of restrictions on non-farm activities:
    - rise and expansion of TVEs
    - structural transformations


Two Structural Transformations
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1978
1979
1980
1981
1982
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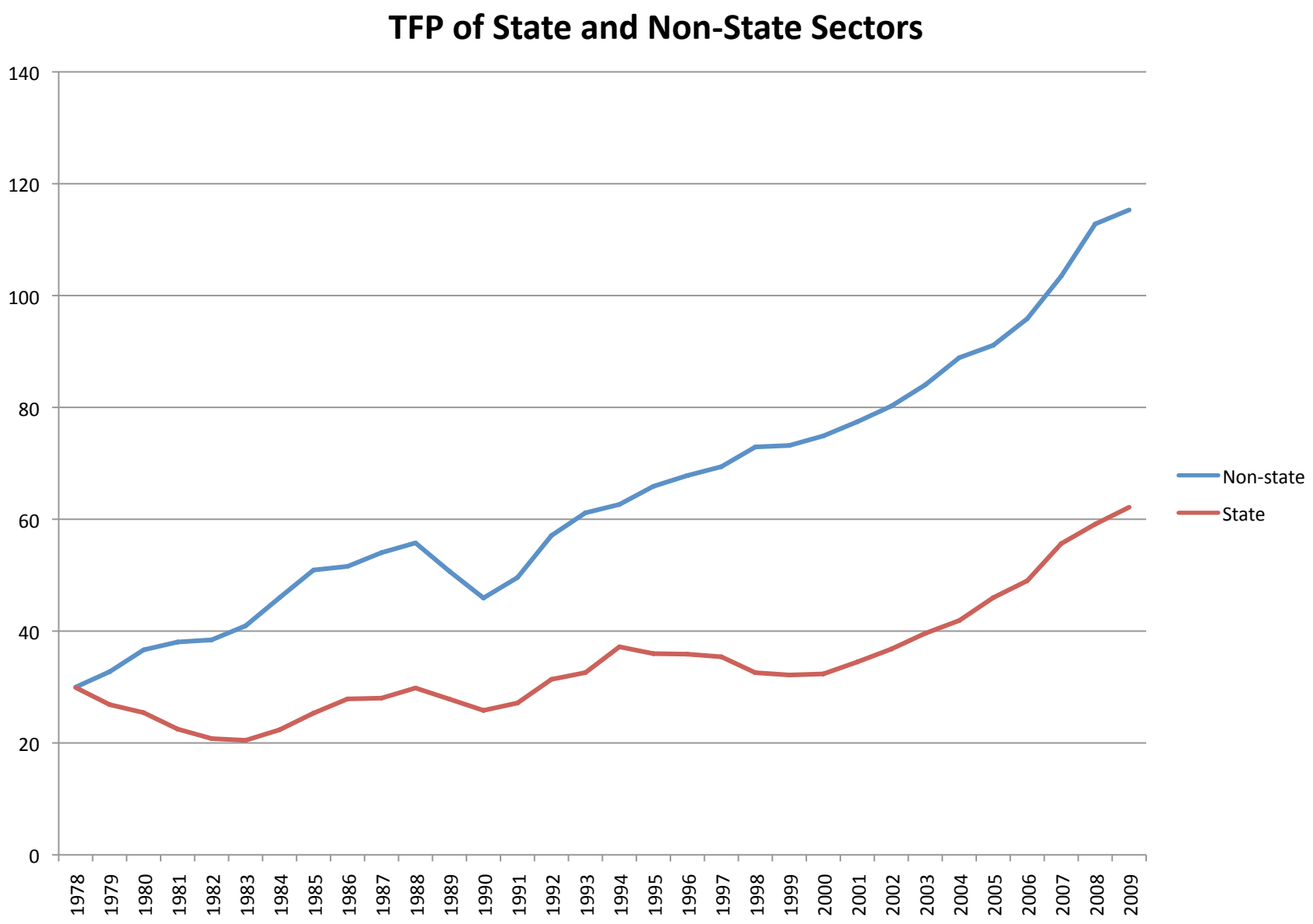
Agriculture's Share of Total Employment
State Sector's Share of Non-agricultural Employment

Policy and institutional reforms

Outside agriculture: A tale of two sectors

- 1978-1988: Rise of the non-state sector
- 1988-1998: From reform without losers to inevitable tradeoffs
- 1998-2007: Privatization and trade liberalization


TFP of State and Non-State Sectors
140
120
100
80
60
40
20
0
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
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2004
2005
2006
2007
2008
2009
Non-state
State

Model-Based Growth Accounting for China: 1978-2009

		Labor Productivity Growth		
	Reduction in Agriculture's Share of Employment	Agriculture	Non-agriculture	Aggregate
Benchmark	-0.45	7.13	5.56	7.86
No TFP growth in Agriculture	-0.01	-0.79	5.96	**5.36**
No reallocation from agriculture	0.00	5.42	5.99	5.99
No state sector downsizing	-0.45	7.12	5.30	7.61
No state sector TFP growth	-0.45	7.13	3.37	5.85
No nonstate sector TFP growth	-0.45	7.13	1.11	**3.98**
No increase in investment rate	-0.40	6.79	4.93	7.07
but capital allocated efficiently	-0.39	6.92	6.26	8.21

Summary

- Productivity growth in non-state non-agricultural sector is the most important source of growth
- Contribution of the labor reallocation from agriculture is significant, but diminishes over time
- Small direct contribution from downsizing the state sector
  - But significant indirect effect through increases in state sector's productivity

Question 2

How long can China's rapid growth be sustained?

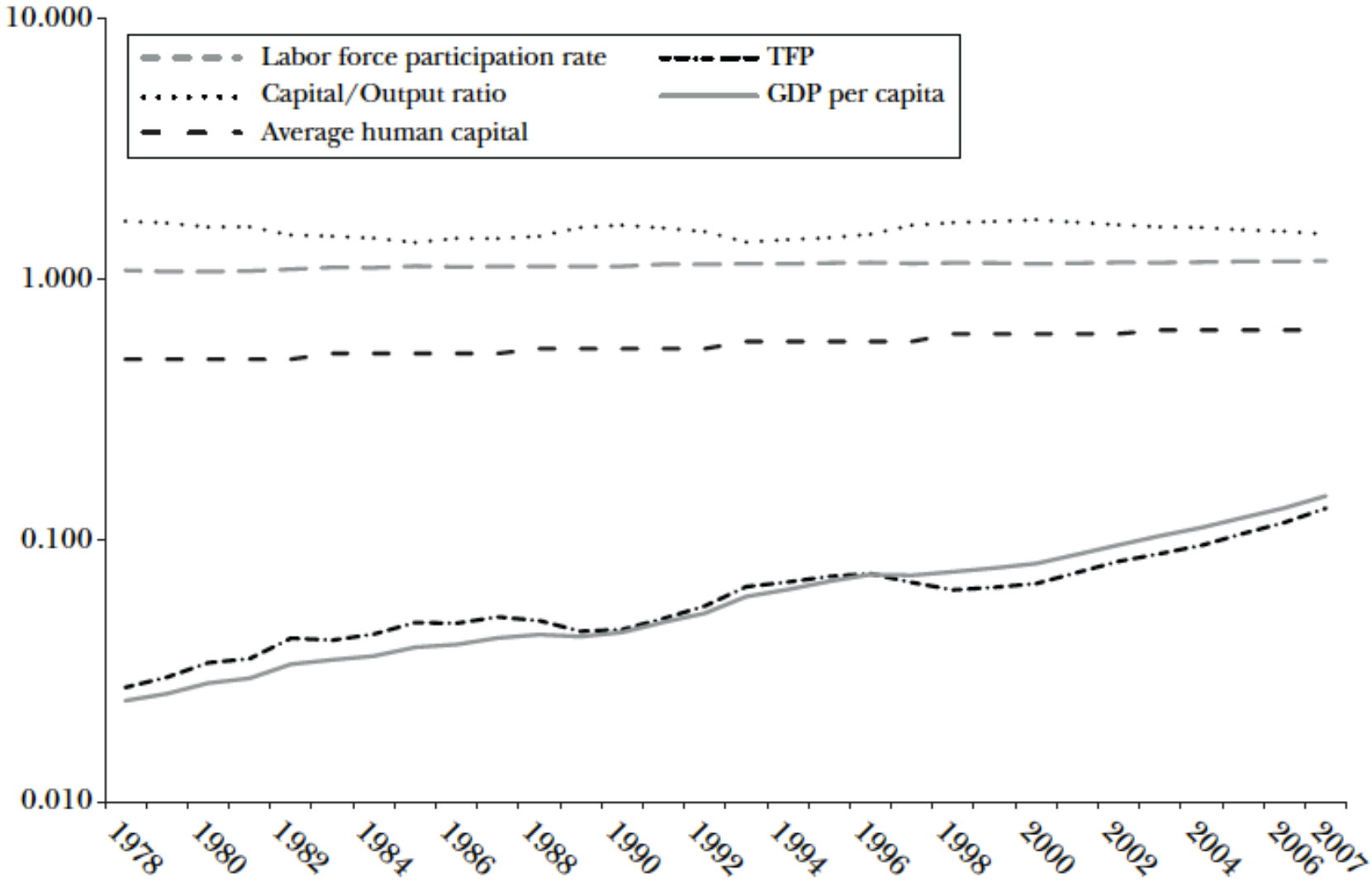
Future prospects of China's growth

- Productivity growth has been the driving force of China's growth in the last three and half decades

- It will continue to be the key source of China's future growth

Figure 3

China Relative to the Uniteed States



Plenty of room for future productivity growth

- In 1978, China's productivity was only 3% of the U.S. level
- After three decades of rapid growth, China's productivity was still only 13% of the U.S. level
- If the rapid growth continues for another two decades, China's productivity level would still be only 40% of the U.S. level

Comparison: Productivity growth in Japan and Korea

- In contrast,
  - Japan's productivity level was 56% of U.S. level in 1950 and 83% of U.S. level in 1975
  - Korea's productivity level was 43% of U.S. level in 1965 and 63% of U.S. level in 1990

Where will future productivity growth come from?

- Still plenty of room for adopting and learning best practices and frontier technologies from developed countries

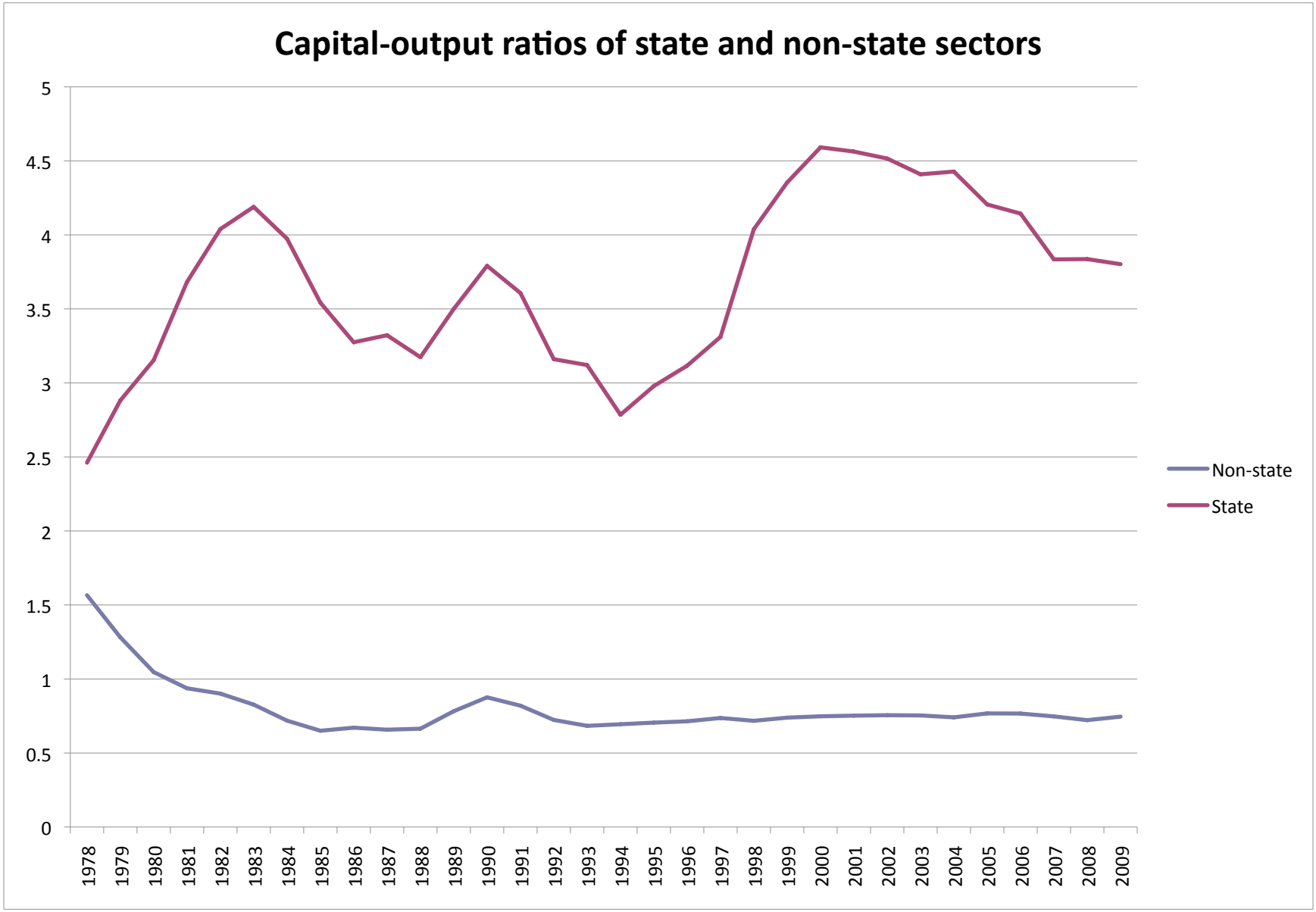
- Further institutional and policy reforms to reduce distortions

Question 3

What are the main challenges China faces in sustaining high rates of growth?

Further institutional and policy reforms

– Reduce capital market distortions


Capital-output ratios of state and non-state sectors
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
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1978
1979
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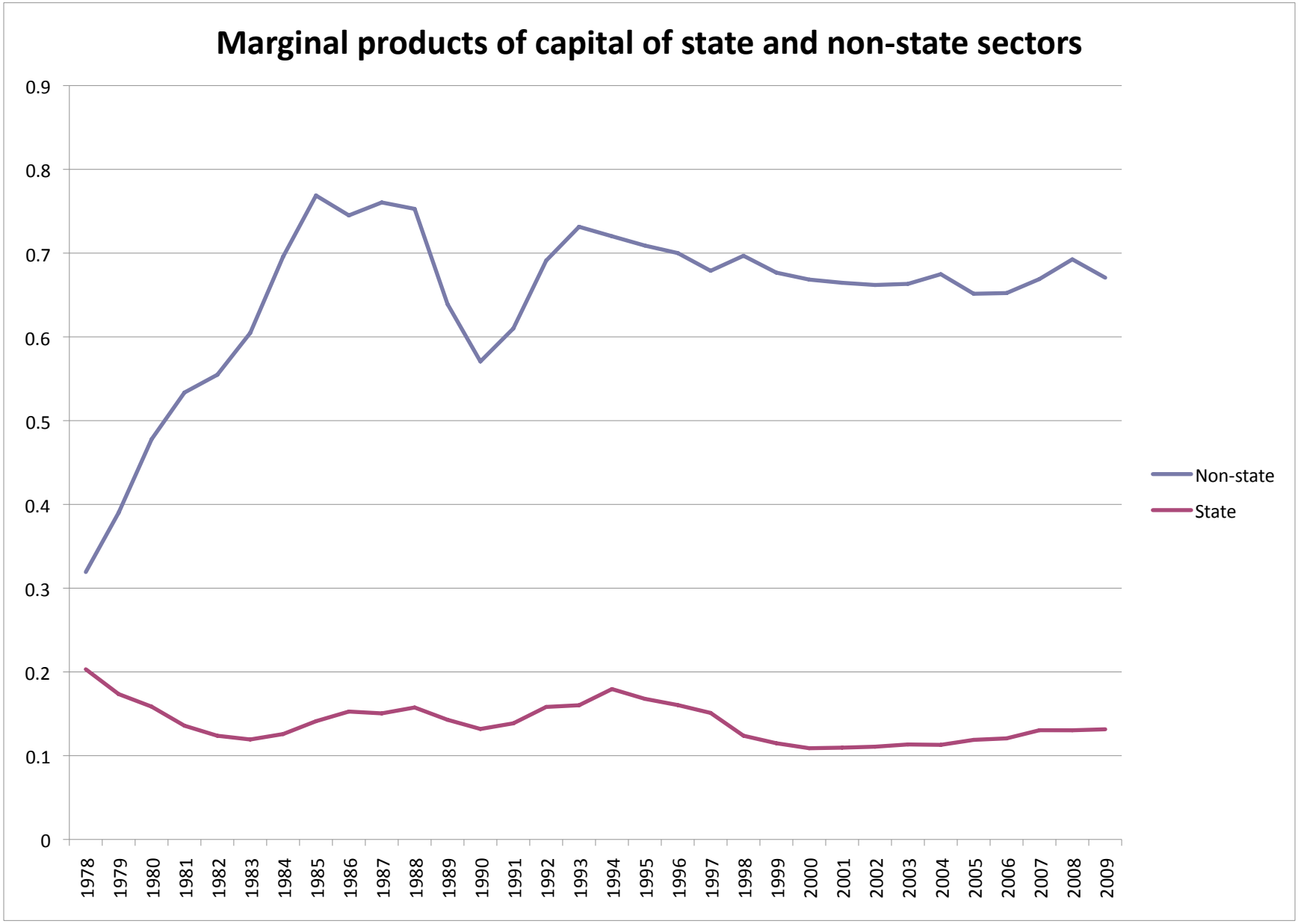
2007
2008
2009
Non-state
State


Marginal products of capital of state and non-state sectors
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
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1978
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Non-state
State

Further institutional and policy reforms

- Capital market distortions have increased in recent years (Brandt, Tombe and Zhu, 2013)
  - Financial centralization: where have all the credit cooperatives gone?
- Needs
  - A more decentralized banking system
  - Entry of small private financial institutions

Further institutional and policy reforms

- Reduce capital market distortions
- Reduce state's monopoly in key industries and services
  - Hsieh and Klenow (2009, QJE) found some improvements in factor allocation within the four-digit manufacturing industries, which contributed to around 2% of the manufacturing sector's TFP growth
  - Brandt, Tombe and Zhu (2013) found a worsening of factor allocation for the non-agricultural sector as a whole, suggesting problems in the service sector or in cross-industry allocation within the manufacturing sector
  - He, Zhang, Han and Wu (2012) shows that productivity growth is significantly lower in the non-tradable sector

Further institutional and policy reforms

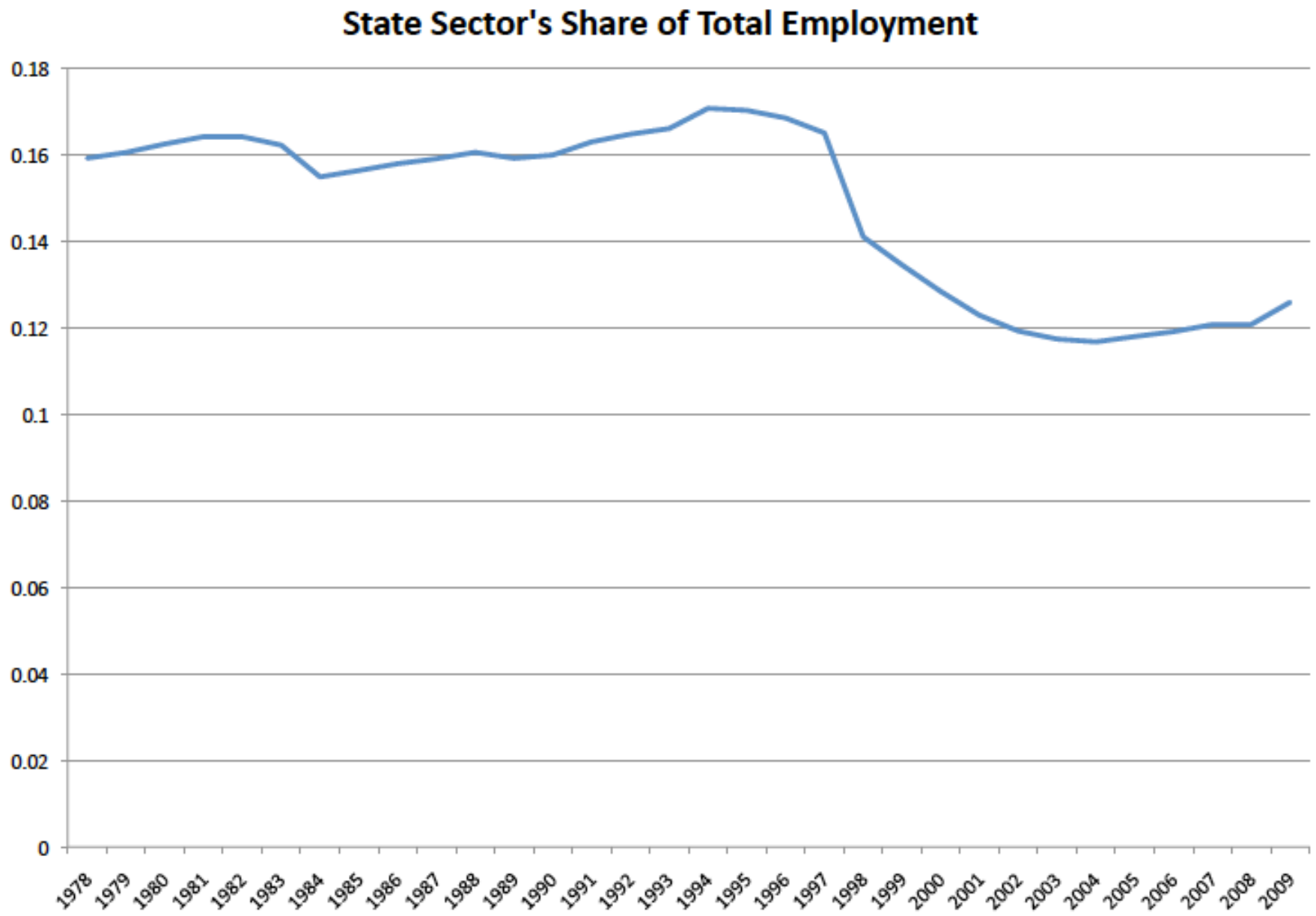
- Reduce capital market distortions
- Reduce state's monopoly in key industries and services
  - Energy
  - Telecommunication
  - Transportation
  - Banking
  - Health care
  - Education

Where will future productivity growth come from?

- Further institutional and policy reforms
  - Reduce capital market distortions
  - Reduce state monopoly in key industries and services
  - Reduce barriers to labor mobility
    - Brandt, Tombe and Zhu (2013) shows that, despite 150 million cross-province migrant workers, cost of labor market distortions has not declined

Conclusion

- China's growth has been driven by productivity, not by capital investment
- Lack of capital is still a barrier to growth for the non-state sector
- If capital were allocated efficiently, China could have achieved the same growth performance without any increase in the investment rate
- Reducing capital market distortions should be the focus of China's growth rebalancing strategy
    - **but, political constraints**


State Sector's Share of Total Employment
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1978
1979
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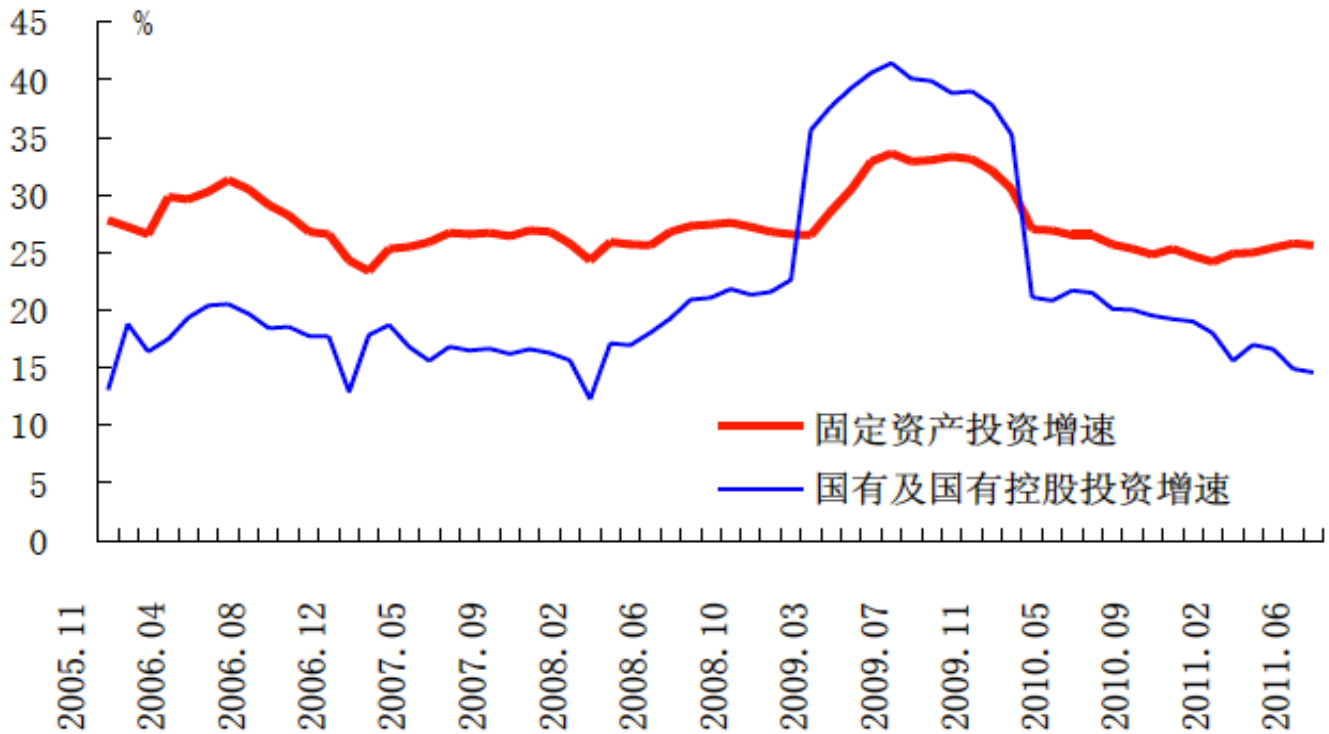
Growth rates of investment



数据来源：国家统计局。

Red: Growth rates of total investment
Blue: Growth rates of state-sector investment