

China's Transformation into a Knowledge-based Economy

-- To Meet the Challenges for Sustainable Development

WBI GLOBAL INNOVATION POLICY DIALOGUE

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Issues To Be Discussed

- Concepts and Focus of Discussion
- Achievement of and Challenges for China's Sustainable Development
- Transformation into KBE to Meet the Challenges
- K4D: Advantages for LDC in the Knowledge Era
- Building Capacity at the Microeconomic Level
- Concluding Remarks

1. Concepts and Focus of Discussion

The Essence of Knowledge-based Economy is to Use Knowledge for Development.

Four pillars of knowledge-based economy (As defined in *China and the Knowledge Economy*, 2001)

- Good economic and institutional regime
- Well educated and skilled populace
- Effective ICT infrastructure
- Effective innovation system

The Focus: Success of Development of LDCs will mainly depend on the capacities to acquire and use knowledge for development

2. The Achievement of China's Development

Outline of China's Economic Reform (two pillars: reform and opening-up)

- 1978 Reform and Opening-up Started
- 1993 Formally Stated the Goal of Reform is to Establish a Socialist Market Economy
- 2001 Joined the WTO
- **Microeconomic foundations changed**
 - A functional market created
 - Companies with diversified ownerships competing with each other
 - Government is re-defining its roles
- **Integrated into global economy**
 - Large inflows of FDI
 - Increasing volume of Trade

Over the past quarter-of-a-century of reform and opening-up, China has experienced sustained high economic growth.

CHINA'S GROWTH ACCOUNTING

	PERIOD	Official GDP Growth Rate (%)	Est. GDP Growth Rate (%)	FACTORS INPUT			TFP (%)	TFP CONT. (%)
				Capital (%)	Labor (%)	Human Resource s (%)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) =(8)/(3)
WB	1978-1995	9.4	8.2	8.8	2.4	2.7	3.1	32.98
BOSWORTH &COLLIN	1960-1970		0.9	0.0		0.3	0.5	55.56
	1970-1980		2.8	1.6		0.4	0.7	25.00
	1980-1990		6.8	2.1		0.4	4.2	61.76
	1990-2000		8.8	3.2		0.3	5.1	57.95
	1960-2000		4.8	1.7		0.4	2.6	54.17

SOURCE: ZHANG ET. AL, 2005

Energy consumption of Economic Growth

(Unit: ton std. coal/10,000Yuan , 1978 prices)

year	GDP (in. households)	GDP (not in hh)	Agriculture.	Secondary Industry	Industry	Construction	Service	Communications et	retail	others
1980	14.34	12.06	3.26	19.21	20.85	5.35	5.35	14.76	1.82	3.66
1985	10.97	9.06	2.56	15.16	16.20	4.31	3.48	11.56	1.04	2.63
1990	9.67	8.12	2.50	12.96	13.79	2.94	2.96	8.84	1.36	2.05
2000	4.87	4.31	2.05	4.82	4.99	1.30	2.49	6.73	1.53	1.40
2001	4.69	4.15	2.15	4.58	4.73	1.23	2.41	6.36	1.56	1.36
2002	4.76	4.21	2.18	4.62	4.75	1.25	2.38	6.37	1.58	1.31

Source: Zhang et. al (2005)

3. Key Challenges for China's Sustainable Development

- Limited natural resources and severe environment constraints
 - Land, water, and raw material
 - Environmental capacity to sustain a modern society
- **Quality of Growth to be improved**
 - **Low efficiency (high input low output)**
 - **Low value added**
 - **High level of pollution**
- Social development not in line with economic growth
 - Education
 - Healthcare
 - Social security
- Increasing inequality and Regional disparity
 - Inequality between social groups
 - Inequality in development between regions
- Worsening terms of trade
 - Increasing protectionism and trade frictions

Change of Energy Consumption Intensity in Various Countries and Economies (Nominal Exchange Rate)

Country & Economies	Energy Consumption Intensity (ton oil eq/ million USD)				Intensity Change (Starting Year/ End Year)		
	1971	1980	1990	1999	1971~1999	1980~1999	1990~1999
China	3761.4	3602.3	2201.6	1129.3	3.33	3.19	1.95
China (30% appropriation)				868.69			
Japan	120.6	104.9	88.9	92.8	1.30	1.13	0.96
US	444.7	379.6	295.3	262.6	1.69	1.45	1.12
UK	314.1	252.2	204.8	183.4	1.71	1.38	1.12
Germany	..	197.1	156.6	129.5	..	1.52	1.21
Korea	208.8	276.6	268.8	319.6	0.65	0.87	0.84
Indonesia	970.2	803.4	670.5	682.0	1.42	1.18	0.98
Phillipins	437.1	376.5	424.9	480.1	0.91	0.78	0.89
Thailand	500.6	437.0	389.0	431.2	1.16	1.01	0.90
India	1559.0	1561.6	1308.8	1069.8	1.46	1.46	1.22
Argentina	194.8	191.4	239.7	214.0	0.91	0.89	1.12
Mexico	378.3	445.9	468.2	425.5	0.89	1.05	1.10
Brazil	272.2	215.4	219.6	238.3	1.14	0.90	0.92
Peru	291.7	262.9	271.0	222.3	1.31	1.18	1.22
Romania	..	1653.0	1579.5	1130.7	..	1.46	1.40
Russia	1756.2	1827.5	0.96*
世界平均	390.2	367.8	327.1	295.5	1.32	1.24	1.11

The investment rate is researching alarmingly high level

Investment vs. GDP growth



Up, up ... and away?



Source: UBS Investment Research, 30 March 2005

4. Transformation into KBE to Meet the Challenges

New patterns of industrialization

- Focusing on productivity growth
- Promoting technology and innovation
- Investing in human resources
- Widely using Information and communications technology
- Strengthening social regulation

The essence of the transformation is to transform the input-driven growth to knowledge-based growth.

5. K4D: Advantages for LDC in the Knowledge Era

The advantage of being latecomers: able to learn from experiences and lessons of developed economies:

- To acquire technologies for economic growth
 - Less uncertainties with proven technological trajectories
 - Technology development process can be compressed
 - Localization of technology required in some cases
 - Technological leapfrogging or path-creation possible
- To learn to get the institutions right so as to get market work

The Primacy of Learning

Learning to be a better learner: the capacity to learn is of crucial importance to developing countries

- Learning to produce
- Learning to gain managerial know-how
- Learning to modify existing technologies
- Learning to introduce organizational changes
- Learning to innovate

Sources of Technologies for DCs

Acquisition of Technical Information for Industrial Development

- Technology transfer through FDI
- Purchasing new tools (embodied technology)
- Purchasing new technologies (disembodied technology)
- Technological cooperation with foreign companies
- Indigenous innovations through domestic

From Learning to Innovating for DCs

Different innovation space faced by developing countries is characterized by the following features

- stage of technology development
- institutional environment
- factor endowments
- different demand conditions
- trade environment

Factor endowments & demand conditions dependent innovation is of strategic importance

Factors Effecting China's Technological Progress

- Being a developing country : learning is still of primary importance
- Economy in transition: both the economic system and national system of innovation under restructuring
- Facing globalization : technology acquisition facilitated by the globalization process
- Technological revolution : ICT as enabling technology has changed the landscape of technological progress for developing countries

5. Building Organizational Capabilities at Microeconomic Level

For companies in developing countries to utilize technology and innovation for wealth creation, the following capabilities must be developed

1. **Managerial capability:** to employ all sources and coordinate all activities for a viable business. Competence of top management essential
2. **Functional capability:** product development, production management, marketing and service.
3. **Technical capability:** to import, digest, and latter innovate technologies

Concluding Remarks

- Over two decades reform has resulted in a fast developing market economy, which in turn has led to fast economic growth in China.
- China faces grave challenges for sustainable development, with many problems accumulated over the past decades.
- The solution is to change from input-driven low quality growth to knowledge-based efficient growth, to transform into a knowledge-based economy.
- To deepen reform is the key to realize this transformation in China

Thank You!