

This report was prepared by the Mizuho Research Institute Ltd. by the commission of the Economic and Social Research Institute in fiscal 2005.

Comparative Analysis of the BRICs

(abstract)

March 2006

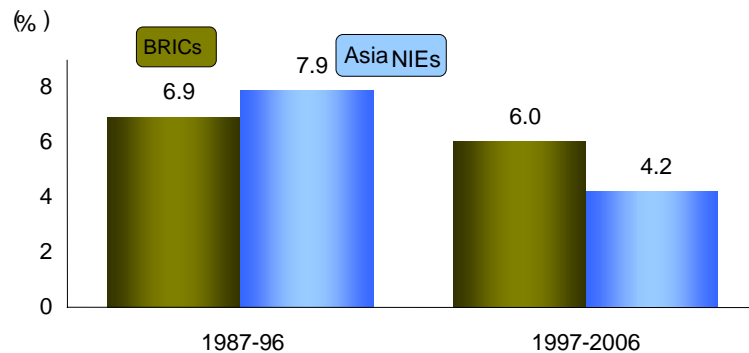
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I. BRICs – reasons for the focus of attention

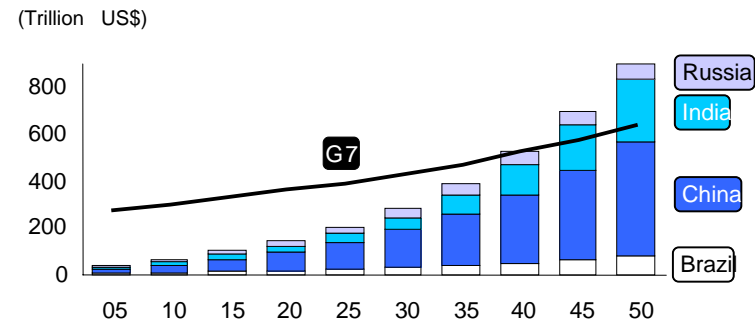
■ BRICs economies are growing strongly and possess huge potential

- The "BRICs" refers to the four countries including Brazil, Russia, India and China
- High economic growth; the BRICs economies are continuing to grow strongly in contrast to the Asian and NIEs economies which have slowed down to half the speed [Chart 1-1]
- Huge potential growth; Goldman Sachs Report (October 2003, updated December 2005)
 - Outlook on BRICs' economic growth up to 2050, based upon the rate of economic growth and forex rate
 - The size of the BRICs economy will be comparable to the G7 nations in 2040 [Chart 1-2]. The ranking in terms of the size of the economy in 2050 will be (1) China, (2) US, (3) India, (4) Japan, (5) Brazil, (6) Mexico, and (7) Russia.

Chart 1-1 Comparison of GDP growth: NIEs vs. BRICs **Chart 1-2 Long-term outlook on BRICs real GDP**



Note: Real GDP growth (yearly average).
Source: IMF, "World Economic Outlook," September 2005.



Note: US\$ value in 2005.
"G7" = Canada, France, Germany, Italy, Japan, UK, US.
Source: Goldman Sachs, "How Solid are the BRICs?" December 2005.

II. The rising presence and influence of the BRICs

(1) BRICs' position in the global economy

■ BRICs – a 10% player in the global economy [Chart 2-1]

- Total land area: 29%. Population: 43% of the world.
- Nominal GDP: 9%. Exports 10% share. Foreign direct investment 6%. Foreign reserves: 24% of the world.
- In terms of per-capita GDP, the BRICs economies are equivalent to the average developing nation [Chart 2-2]. In terms of income levels, Brazil and Russia stand on par with Japan in the second half of the 1960s, China is on par with Japan around 1960 and India is on par with Japan in the first half of the 1950s.

Chart 2-1 BRICs' share of the global economy

	Population	Nominal GDP	Nominal GDP (PPP)	Exports	FDI outstanding	Foreign currency reserves
BRICs	42.6	8.6	24.3	10.4	6.0	23.7
Brazil	2.8	1.5	2.6	1.1	1.7	1.4
Russia	2.3	1.4	2.6	2.0	1.1	3.1
India	17.0	1.6	5.9	0.8	0.4	3.3
China	20.5	4.0	13.2	6.5	2.8	15.9
Developed nations	12.7	70.1	46.9	52.8	60.3	31.8
US	4.6	28.7	20.9	8.9	16.5	2.0
Japan	2.0	11.4	6.9	6.2	1.1	21.6
EU15	6.1	30.0	19.2	37.7	42.6	8.2
Asia NIES	1.3	3.1	3.5	9.6	8.0	21.0
ASEAN10	8.6	1.9	4.3	6.0	3.6	7.4
Global total	100.0	100.0	100.0	100.0	100.0	100.0

Notes: 1. Data as of 2004 (except for population (2003)).

2. Dollar-based, except for population.

3. Brunei is not included in data on foreign currency reserves.

Sources: IMF, UNCTAD, World Bank, WTO.

Chart 2-2 Per-capita real GDP

1	Luxembourg	58,852.4	49	Malaysia	8,986.3
2	Ireland	35,650.5	50	Russia	8,719.7
3	Norway	35,586.5	51	Mexico	8,661.2
4	US	35,484.4			
5	Denmark	29,724.7	54	Grenada	7,518.3
6	Iceland	29,515.4	55	Brazil	7,359.5
7	Canada	28,980.7	56	Bulgaria	7,303.8
8	Switzerland	28,862.2			
9	Austria	28,429.2	83	Lebanon	4,793.0
10	Australia	27,993.2	84	China	4,726.4
11	Netherlands	27,746.7	85	Venezuela	4,646.5
12	Belgium	26,767.5			
13	Japan	26,419.9	104	Vanuatu	2,781.5
14	Germany	26,220.8	105	India	2,731.9
15	France	26,146.0	106	Honduras	2,517.7

Note: 2003, US\$ value gauged by purchasing power parity.

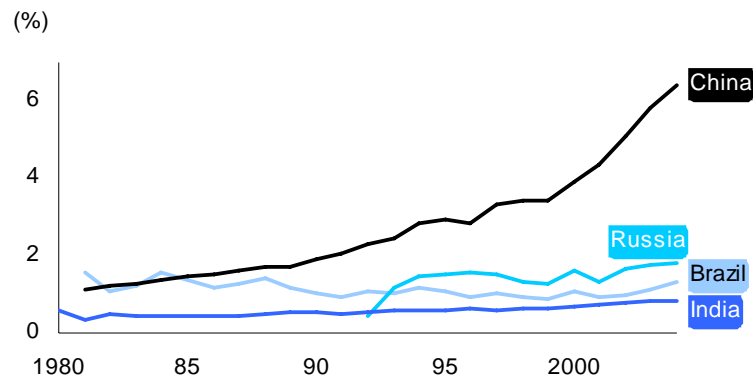
Source: World Bank, "World Development Indicators."

(2) Trade and FDI

■ BRICs: growing presence in global trade and foreign direct investment

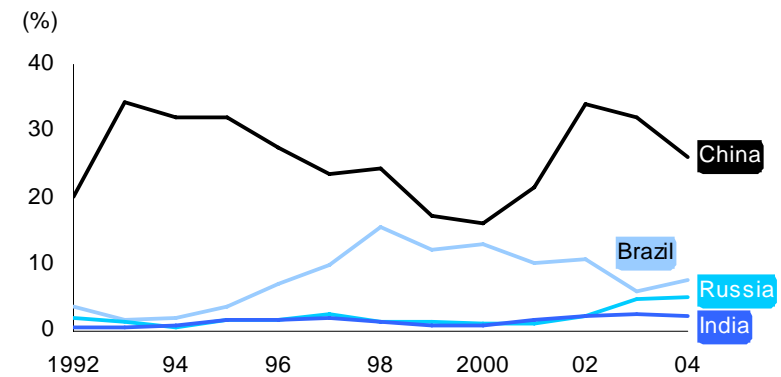
- The percentage share of the BRICs in global export grew from 4.2% in 1992 to 10.1% in 2004, while the share of global trade among developed countries shrank from 52.6% to 42.1%.
- Approximately 10% of global exports is comprised of exports by the BRICs. However, among the BRICs countries, there is a large gap between China and the remaining three countries. China's exports are growing to 6.4% of global exports (2004), which contrasts with Russia (1.8%), Brazil (1.3%) and India (0.8%). [Chart 2-3]
- The gap between China and the remaining three countries is also prevalent with respect to foreign direct investment (FDI). In comparison to 9.4% of global FDI inflows to China (2004, flow-basis), there is a gap of approximately 3.4~11.8 times with Brazil (2.8%), Russia (1.8%) and India (0.8%). The value of FDI inflows to China is approximately 30% of FDI to developing countries. [Chart 2-4]

Chart 2-3 Share of BRICs in global trade (based upon exports)



Source: IMF, "Direction of Trade Statistics Yearbook, 2005."

Chart 2-4 Share of BRICs in FDI to developing countries (flow-basis)



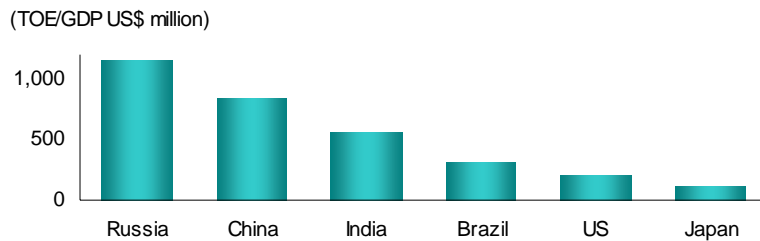
Source: UNCTAD, "World Investment Report 2005."

(3) Energy supply and demand

■ Energy demand among the BRICs is rising due to economic growth

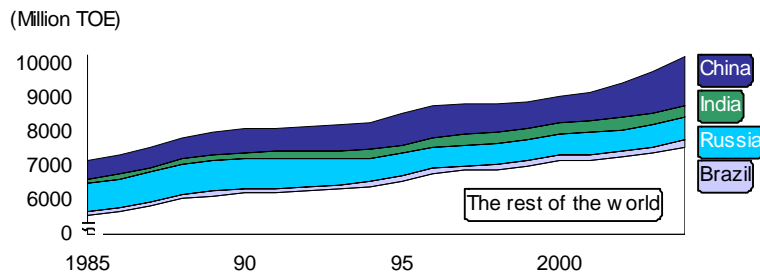
- Energy demand among the four BRICs countries is rising amid solid economic growth in recent years.
 - Unit energy consumption (energy consumption per unit of GDP output) among the BRICs is very high. [Chart 2-5]
 - Primary energy consumption among the BRICs rose 61.7% from 1985 to 2004, while global primary energy consumption increased 42.1% (contribution by BRICs: 33.2%). As a result, the percentage share of BRICs' primary energy consumption in the world rose from 22.7% in 1985 to 25.8% in 2004. [Chart 2-6]
- On the supply side, Russia gained importance as an exporter of crude oil and natural gas.
 - The three B(R)ICs countries other than Russia are all net importers of crude oil [Chart 2-7].

Chart 2-5 Unit energy consumption of the BRICs



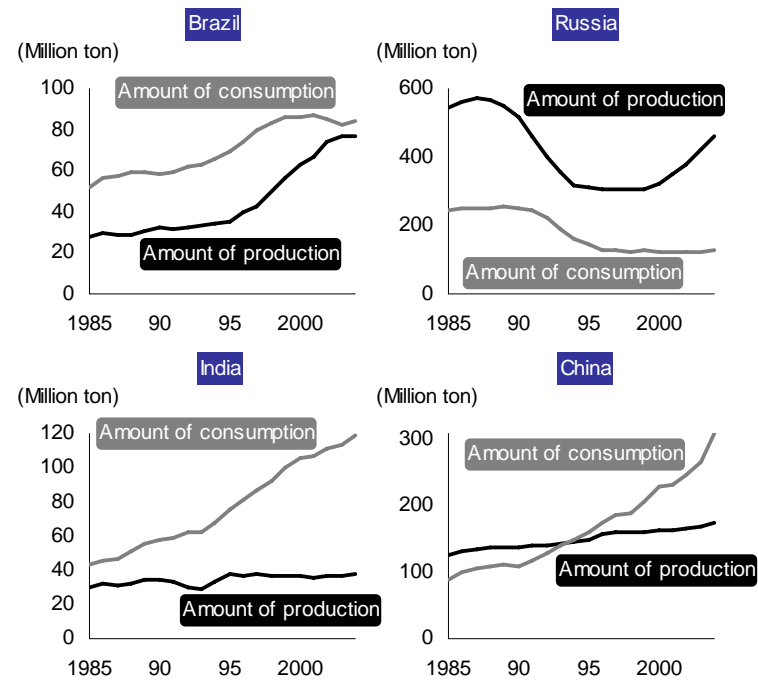
Note: 2004. TOE = ton of oil equivalent.
Sources: IMF, BP (British Petroleum).

Chart 2-6 Primary energy demand of the BRICs



Source: BP (British Petroleum).

Chart 2-7 Crude oil supply and demand of the BRICs



Source: BP.

(4) Environmental issues

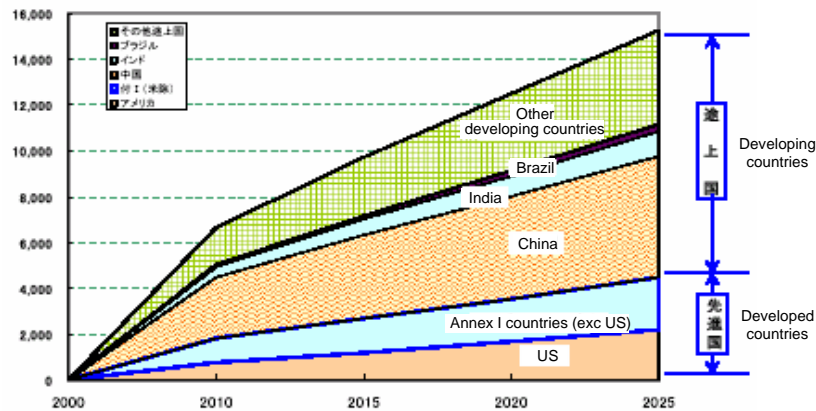
■ Exacerbating environmental pollution issues due to rapid industrialization and population concentration in large cities

- Issues regarding air & water pollution, waste disposal and the decline of woodlands are worsening.
- The increase of CO₂ emissions among the BRICs may escalate into a global environment issue. [Chart 2-8]

■ Environment technology transfers from developed countries to the BRICs are indispensable for sustainable economic development

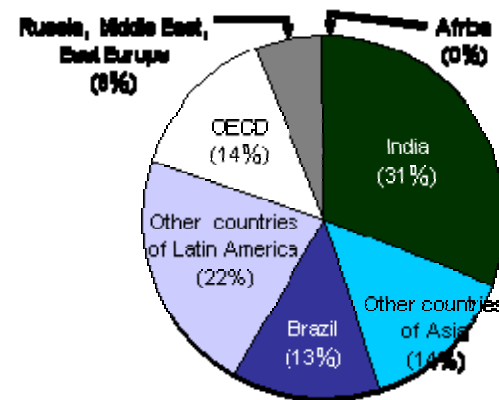
- For example, given the high potential of greenhouse gas reduction in the BRICs [Chart 2-9], the Kyoto Mechanism is the key to effective measures to counter global warming.

Chart 2-8 Outlook on global CO₂ emissions



Source: Compiled by the Ministry of Economy, Trade and Industry (Japan), based upon data released by the US Department of Energy.

Chart 2-9 Shares of greenhouse gas reduction operations, by region & country



Note: Percentage of greenhouse gas reduction accomplished and planned during Jan 2004 - Apr 2006.

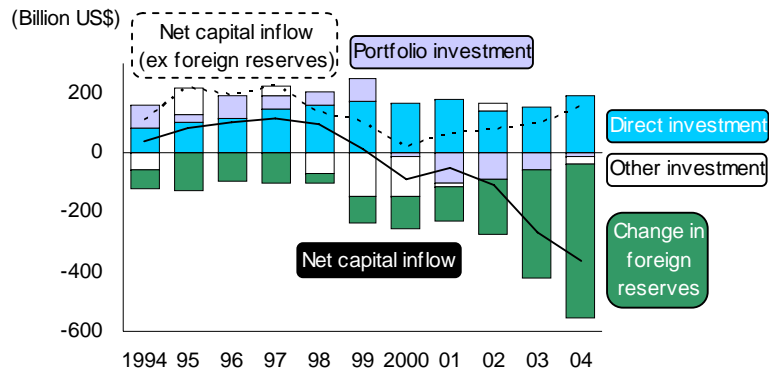
Source: World Bank.

(5) International finance

■ Rising impact of the BRICs in global financial markets

- The BRICs share part of the global imbalance.
 - The US current account deficit (capital imports) and the current account surplus (capital exports) of emerging and oil producing countries including the BRICs. Capital movements run counter to the "common assumption" that capital flows from developed countries to developing countries.
 - Recent capital exports by emerging countries stem mainly from rising foreign exchange reserves. [Chart 2-10]
- In the background to the rise of foreign exchange reserves, there are "self-insurance" motives against financial crises. However, the reserves are surpassing targets and may be reaching excessive levels. [Chart 2-11]
 - Ratio to imports: reserves for a "current-account crisis" – approximately 3-months
 - Ratio to short-term external debt: reserves for a "capital-account crisis" – 1-times

Chart 2-10 Net capital inflows to emerging countries



Source: IMF, "Global Financial Stability Report," September 2005.

Chart 2-11 BRICs foreign exchange reserves

	Foreign reserves (Million US\$)		Ratio to imports (months)		Ratio to short-term external debt (times)	
	1996	2004	1996	2004	1996	2004
Brazil	58,323	52,740	10.60	7.90	1.11	1.33
Russia	11,276	120,809	1.56	11.14	0.42	3.72
India	20,170	126,593	4.40	16.17	2.65	4.97
China	107,039	614,500	8.33	12.16	3.80	14.38

Notes: 1. India's ratio of imports (2004) is the ratio of FX reserves to imports in 2003.
 2. Short-term external debt refers to the total of bank loans with less than a year until maturity and bonds (the two may overlap).

Source: "Joint BIS-IMF-OECD-World Bank Statistics on External Debt."

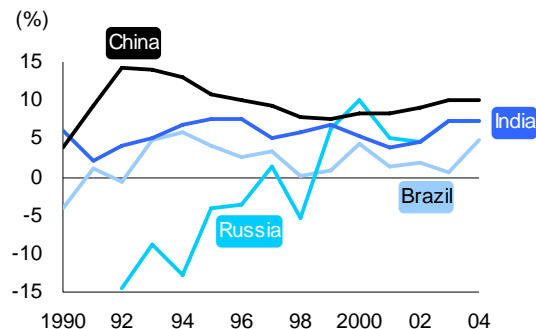
III. BRICs - characteristics of economic development patterns

(1) Macroeconomic performance

■ BRICs are currently recording strong economic growth [Charts 3-1, 3-2,3-3]

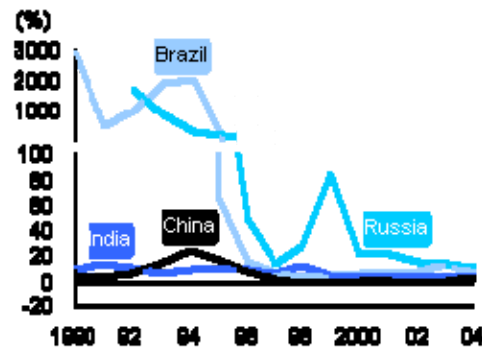
- However, there are disparities in sustainability and stability.
 - Even though Brazil experienced a period of hyperinflation in the early 1990s, it regained stability by adopting the "Real Plan." Brazil's economic growth reached approximately 5% in 2004.
 - Russia also suffered from negative economic growth and high inflation from its start in 1992 up to 1998. However, Russia has maintained high economic growth from then onward.
 - China and India have been maintaining high stable growth since the 1990s. Although China's rate of economic growth is higher, India prevails in terms of stability.

Chart 3-1 Real GDP growth



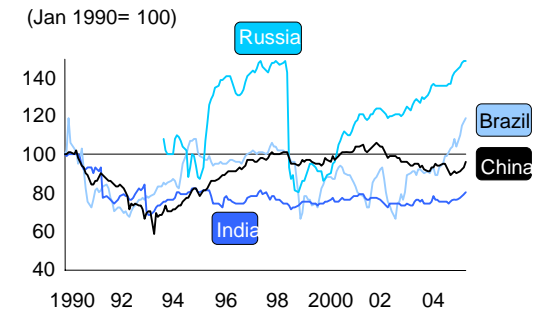
Sources: IMF, "World Economic Outlook Database," Sept. 2005, National Bureau of Statistics of China.

Chart 3-2 The CPI



Source: IMF, "World Economic Outlook Database," Sept. 2005.

Chart 3-3 Real effective exchange rate



Notes: 1. Monthly data.
2. For Russia, Jan 1993 = 100.
Source: Datastream.

Country	Real GDP		CPI		Real effective exchange rate
	Yearly average	Instability	Yearly average	Instability	Instability
Brazil	2.5	0.02	69.0	2.39	11.7
Russia	-0.9	0.15	46.7	0.97	20.0
India	5.7	0.02	7.3	0.06	6.4
China	9.0	0.04	5.4	0.15	10.2

Note: "Instability" represented as standard error of the mean (the real effective exchange rate is the standard deviation). The lower the value, the more stable.

Source: IMF "World Economic Outlook Database," Sept. 2005 Datastream

(2) The drivers of growth - industrial and demand structures

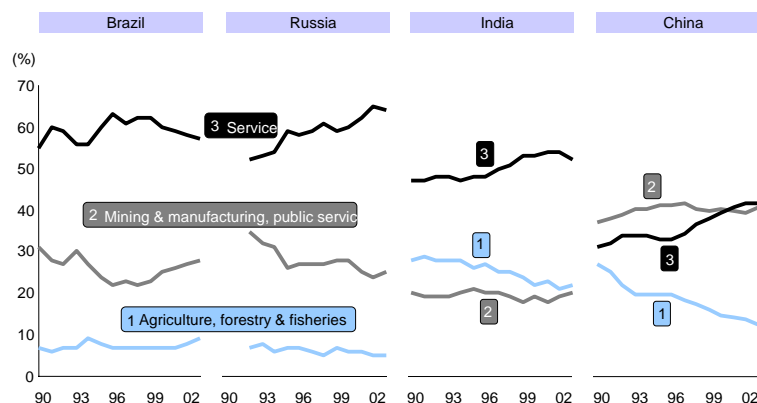
■ Differences from changes in industrial structure [Chart 3-4]

- Brazil: Shift toward the service sector from the mid-1980s. However, agriculture, forestry & fisheries and the mining & manufacturing sectors are growing faster given the rising price of food and mineral resources.
- Russia: Sectors related to natural resources such as petroleum and natural gas are fueling the strong growth.
- India: Services (mainly IT-related) are the drivers of growth.
- China: Despite a gradual shift toward services, the share of mining & manufacturing is the largest among the BRICs.

■ Differences from changes in demand structure [Chart 3-5]

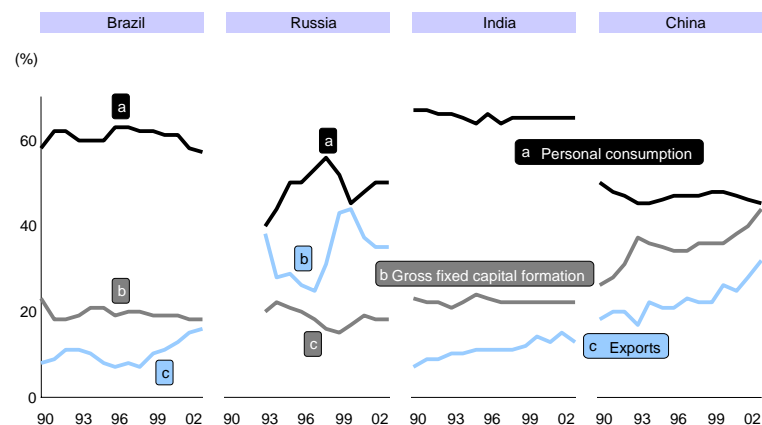
- Brazil: While consumer spending accounts for 60% and gross fixed capital formation accounts for 20% of demand, shares of both components are declining. The percentage of exports is expanding rapidly.
- Russia: Gross fixed capital formation is shrinking as a percentage of demand. High dependence upon exports, reflecting its booming natural resource exports.
- India: Consumer spending is the largest component of demand. Gross fixed capital formation is stable at around 20%. Exports are a relatively small component of demand.
- China: Sharp expansion of gross fixed capital formation and exports, as a percentage of demand.

Chart 3-4 Shifts in industrial structure (based upon GDP)



Note: "3 Services" = 100% minus 1 and the construction sector's share. Nominal basis.
Source: United Nations Statistics Division, and others.

Chart 3-5 Shifts in demand structure (based upon GDP)



Source: United Nations Statistics Division, and others.

(3) The drivers of growth - production factors

■ Growth accounting analysis of the BRICs

- Growth accounting analysis with 4 components: labor, physical & human capital and total factor productivity (TFP).
 - Note: this may not necessarily be compatible with Russia's case, since Russia's growth is generated mainly by extracting natural resources rather than the creation of added value from production factors.
- Growth accounting analysis of the BRICs [Chart 3-6]: In China and India, TFP and physical capital are the drivers of growth. Brazil's growth is driven by the well-balanced input of production factors. Russia's strong growth since 1999 reflects the rise of crude oil prices (resulting in the rise of TFP as a residual).

Chart 3-6 Growth accounting analysis of the BRICs

	Rate of economic growth (real)					Per capita economic growth rate
	Working age population	Physical capital	Human capital	Total factor productivity (TFP)		
(%)						
Brazil						
1991 - 2000	2.7	0.9	0.7	0.6	0.5	0.4
(2001 - 03)	(1.0)	(0.7)	(0.7)	(-0.4)		(-0.7)
Russia						
1994 - 2000	-1.1	0.1	0.0	0.0	-1.2	-1.5
(2001 - 03)	(5.7)	(0.0)	(0.2)	(5.5)		(5.7)
India						
1991 - 2000	5.5	0.9	1.5	0.6	2.5	3.3
(2001 - 03)	(6.0)	(0.8)	(1.0)	(4.1)		(3.8)
China						
1991 - 2000	10.1	0.5	2.5	0.3	6.9	8.9

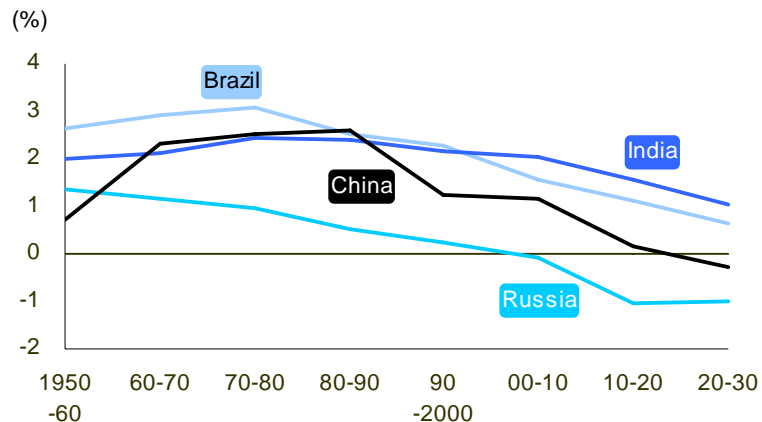
Notes: 1. Physical capital stock for Russia and China are estimates by MHRI. Estimates on Russia are based upon data since 1994 due to its reliability.
 2. Human capital is based upon the average years of schooling of the population aged 15 and older. As regards 2001-2003 on which data on human capital are unavailable, the rate of real economic growth is calculated as follows upon the assumption that the contribution by human capital is included in the rate of TFP growth: real economic growth rate = 0.4 x rate of growth of labor force population + 0.3 x rate of growth of material capital + rate of TFP growth.

Sources: World Bank, "World Development Indicators," United Nations, "World Population Prospects 2004," Barro and Lee Data.

■ Assessing the BRICs in terms of production factors

- Working age population: In contrast to ongoing strong growth in Brazil and India, Russia's population has started to decline [Chart 3-7]
- Human capital: Russia is the leader in terms of the average length of school attendance (however, Russia's per capita income level is low), in sharp contrast to wide disparities in India. [Chart 3-8]
- Physical capital: In terms of investment/GDP ratio since the 1990s, China ranks topmost (almost 40% - concerns regarding "excessive investment") in contrast to the stagnation in Brazil and Russia.
- Savings rate: The breadth of savings surplus (savings - investment) has been expanding (rise of the current account surplus) in recent years. This stems from factors such as the improvement of the fiscal balance (Brazil, Russia, China) and the increase of internal reserves among corporate enterprises (China).

Chart 3-7 Average rate of change of the population (15-64)



Note: Medium variant.

Source: United Nations, "World Population Prospects 2004."

Chart 3-8 Educational attainment among the BRICs

	No school	Primary	Secondary	Higher	Average years of school
	(Percentage in population aged 15 and above)				(Years)
Brazil	16.0	62.2	14.4	7.5	4.88
Russia	1.2	32.1	50.2	16.6	10.03
India	43.9	28.2	23.8	4.1	5.06
China	18.0	33.9	45.3	2.8	6.35
(Reference)					
Japan	0.2	27.5	50.1	22.2	9.47
US	0.8	8.2	42.9	48.1	12.05
Germany	3.9	18.6	61.4	16.1	10.20
Korea	6.5	11.9	55.2	26.3	10.84

Source: Barro and Lee Data.

(4) The role of economic deregulation measures

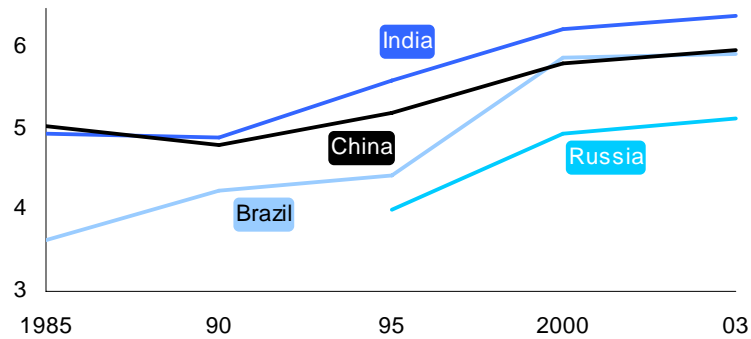
■ Deregulation of the economy and the shift toward a market economy

- Public corporation reforms, deregulation of trade & investment, easing/improvement of regulations related to labor, finance and business. [Chart 3-9]

■ Economic deregulation is contributing to BRICs' economic development, albeit differences in degree of impact

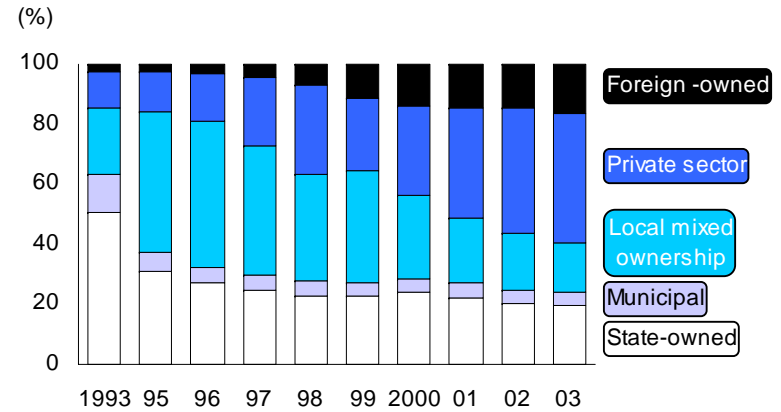
- Brazil: Progress of privatization since the 1990s. Expansion of trade, leveraged by the introduction of foreign capital and opening of markets.
- Russia: Shift of production and investment structure from one comprised mainly of state-owned enterprises to one based upon local private enterprises and foreign enterprises. [Chart 3-10]
- India: The private sector's share in gross fixed capital formation is expanding, triggered by deregulation in 1991. [Chart 3-11]
- China: The share of non-public enterprises such as foreign enterprises and private-owned enterprises is rising in the mining & manufacturing and export sectors. [Chart 3-12]
- However, economic deregulation is only part of the institutional foundation to underpin sustainable growth. More broad-based institutional measures are necessary for sustainable growth.

Chart 3-9 Changes in "Economic Freedom"



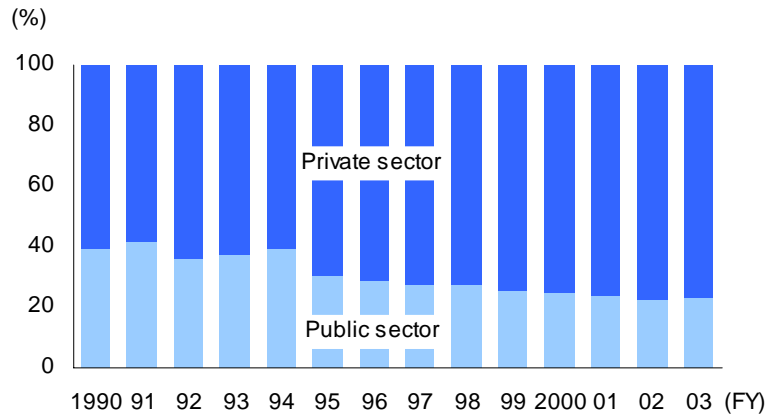
Source: Gwartney and Lawson, "Economic Freedom of the World: 2005 Annual Report," Fraser Institute, 2005.

Chart 3-10 Russia's gross fixed capital formation



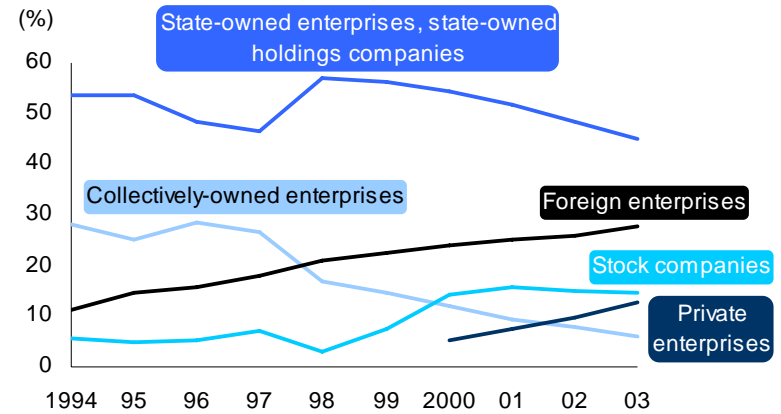
Source: Russian Statistics Agency, "Statistical Yearbook of Russia."

Chart 3-11 India's gross fixed capital formation



Source: Ministry of Statistics & Programme Implementation.

Chart 3-12 China's industrial value-added output (by ownership)



Source: National Bureau of Statistics of China, "China Statistical Yearbook."

IV. BRICs long-term growth projections

(1) Potential growth rate [Chart 4-1]

■ Long-term growth projections in previous research [Chart 4-1]

- Goldman Sachs, "Dreaming with BRICs," 2003/10; "How Solid are the BRICs?" 2005/12
 - Economic growth projection (1): growth accounting analysis based upon the Solow Model in which the production factors are labor, capital and total factor productivity (TFP).
 - Assumes that the lower the per capita income level of a country, the faster the pace of TFP growth (the convergence hypothesis).
 - Currency projection (2): assumes that the real effective exchange rate (to the US\$) is equivalent to the difference in labor productivity growth compared with the US.
 - Projection on the size of the BRICs economies on the basis of **1+2**:
TFP growth due to the convergence hypothesis is the main reason that the BRICs are getting richer and larger. However, there are counter arguments toward the validity of this hypothesis (do all poor countries enjoy high economic growth?)
- Deutsche Bank Research, "Global Growth Centers 2020," 2005/3
 - Forecasts GDP growth up to 2020 by an econometric model in which the working age population, investment, human capital and openness of trade are the explanatory variables. Does not adopt the convergence hypothesis.

Chart 4-1 BRICs economic growth forecast (2006-2020)

	Brazil	Russia	India	China
Goldman Sachs	3.9	3.6	5.8	6.2
Deutsche Bank Research	2.8	(Less than 4%)	5.5	5.2

Note: Forecasts by Goldman Sachs are as of December 2005. Deutsche Bank Research's paper does not provide a forecast on Russia due to the lack of data on human capital (number of years of school attendance).

■ BRICs potential GDP growth (2006 - 2030): the High (India and China) and the Low (Brazil and Russia)

- Projections on potential GDP growth: the working age population is based upon UN World Population Prospects and other production factors are based upon averages from the 1990s onward (however, China's investment ratio and TFP growth rate are assumed to be lower than the 1990s).
- Average economic growth rate: Brazil 2.7%, Russia 1.2%, India 5.4%, China 6.6% [Chart 4-2]
 - China's growth will slow down, India will enjoy high stable growth, Brazil will keep growing at a stable pace and prospects for Russia are uncertain (depends upon natural resource prices and whether Russia can raise its productivity growth by taking advantage of its high level of education).
 - TFP and investment ratio are the key to further growth. Presuming that the convergence hypothesis holds, the rate of TFP growth would be high in all countries: Brazil 3.7%, Russia 3.4%, India 5.1% and China 4.3%. Furthermore, if the investment ratio of BRIs rises to the same level as China, the rate of GDP growth would rise 0.5-0.7% point.
- Even though China's per capital income will rise to levels comparable to the developed countries, income levels in the remaining countries will remain at levels among developed countries.

Chart 4-2 BRICs real GDP growth rate (2006 - 2030 average)

(%)					
	Rate of economic growth (real)				
		Working age population	Physical capital	Human capital	Total factor productivity (TFP)
Brazil	2.7	0.4 (1.0)	0.8 (2.5)	0.6 (2.0)	1.0 (1.0)
Russia	1.2	-0.3 (-0.8)	0.6 (2.1)	0.2 (0.5)	0.8 (0.8)
India	5.4	0.6 (1.4)	1.6 (5.5)	0.6 (2.1)	2.5 (2.5)
China	6.6	0.1 (0.1)	2.3 (7.5)	0.3 (0.8)	4.0 (4.0)

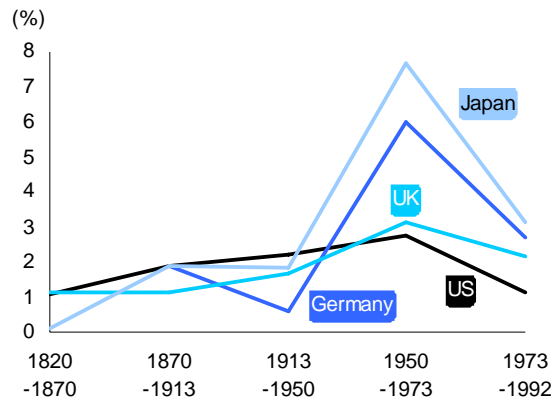
Note: The average rate of economic growth and contribution by each of the production factors (figures in parentheses indicate the rate of growth) during 2006 to 2030.
Sources: World Bank, "World Development Indicators," United Nations, "World Population Prospects 2004," Barro and Lee Data, and others.

(2) Identifying the institutional foundations necessary for sustainable growth

■ What are "good institutions" necessary for sustainable growth?

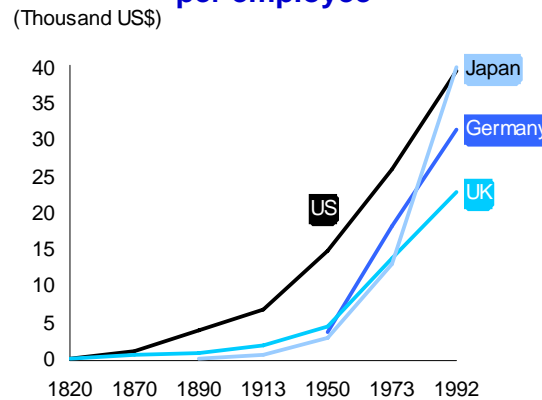
- There are common characteristics in the development process of developed countries (Angus Maddison).
 - Productivity growth through technological progress [Chart 4-3]
 - Accumulation of capital stock [Chart 4-4]
 - Qualitative improvement of human capital [Chart 4-5]

Chart 4-3 Labor productivity growth



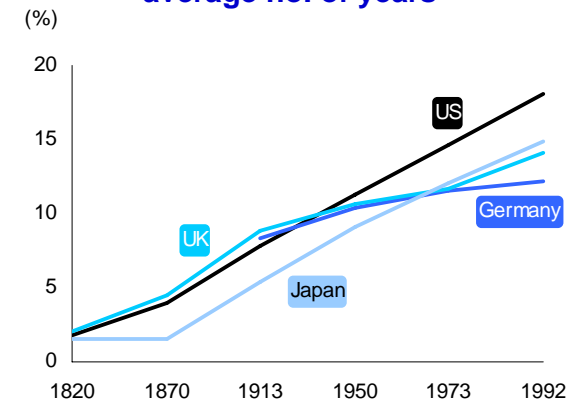
Note: Average GDP per labor hour during each of the time periods.
Source: Angus Maddison, "Monitoring the World Economy 1820-1992."

Chart 4-4 Capital stock per employee



Note: Based on US\$ as of 1990.
Source: Angus Maddison, "Monitoring the World Economy 1820-1992."

Chart 4-5 Schooling - average no. of years



Note: Average of those in the 15-64 age bracket.
Source: Angus Maddison, "Monitoring the World Economy 1820-1992."

- "Good institutions" are necessary for the accumulation of physical and human capital accompanying technological innovation and, in the long run, to achieve long-term economic growth.

1. Institutions to nurture "technological innovation"	Quality of research institutions, R&D strategies of corporations and universities, protection of intellectual property rights and others
2. Institutions to nurture "human capital"	Educational and healthcare measures to raise the rate of adult literacy and average life expectancy
3. Institutions for construction of "physical infrastructure"	State of infrastructure development and the efficiency of infrastructure management
4. Institutions to protect "private property rights"	Improvement of laws regarding private property rights, its appropriate application, judicial independence
5. Institutions to build "social cohesiveness"	"Narrowness" of income gap, political and social stability, freedom of speech, accountability and others.
6. Institutions to upgrade "governance"	Efficiency of government sector, existence/nonexistence of corruption and others

Source: Naoko Ishii, "Choki Keizai Hatten no Jissho Kenkyu (Empirical research on long-term economic development) 2003."

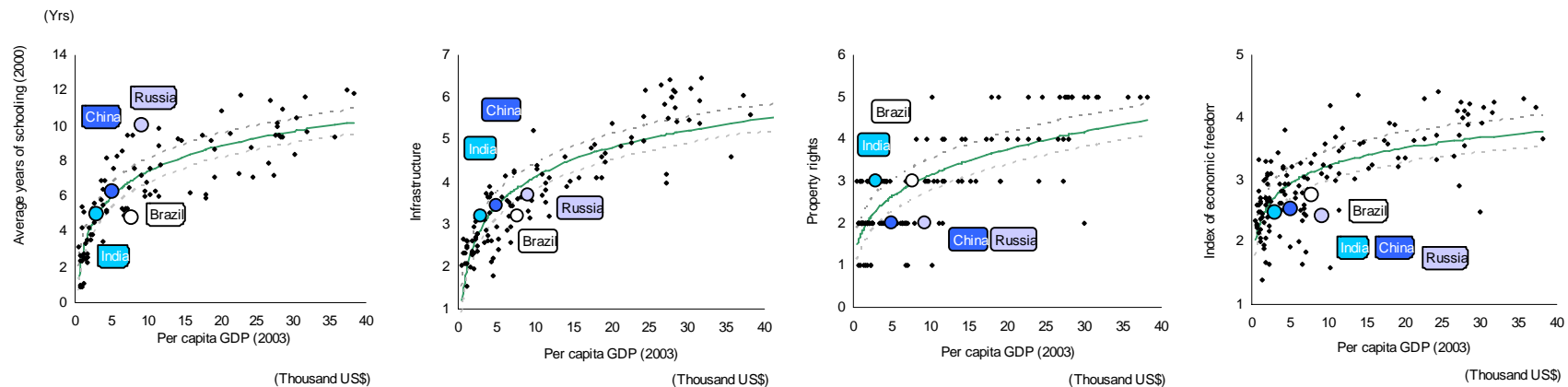
■ Institutional development among the BRICs: human capital, infrastructure, protection of private property and economic freedom

➤ There is a strong correlation between institutional development and income levels. Furthermore, countries where institutions are relatively developed in comparison to income levels tend to achieve high growth (IADB).

➤ Notable features of the BRICs' institutional development are as follows [Chart 4-6]:

- **Human capital:** Brazil faces serious problems regarding education. Even though Russia's educational standards are high on an absolute basis, it is not fully utilized.
- **Infrastructure:** Brazil and Russia are lagging in infrastructure development, relative to their income levels. Although India's infrastructure development is relatively favorable in relation to its level of income, the absolute level of infrastructure development is still low, and frequently cited as an impediment to business.
- **Protection of property rights:** the level of protection is low in Russia and China.
- **Economic freedom:** with the exception of India, the levels of freedom are still low even in relative terms to income.

Chart 4-6 Institutional development among the BRICs

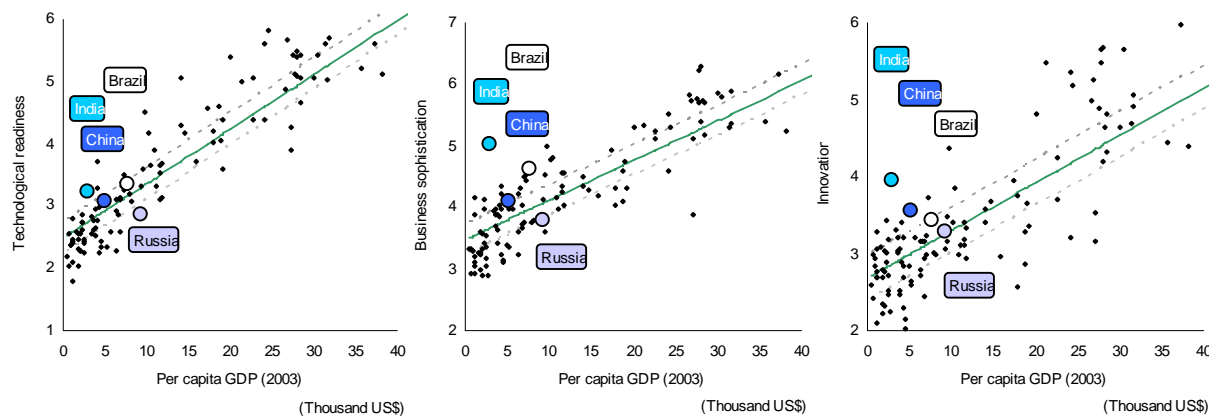


Sources: Barro and Lee, World Economic Forum(2005), Global Competitiveness Report 2005-2006, Miles, Feulner and O'Grady(2005), 2005 Index of Economic Freedom, The Heritage Foundation, 2005, IMF(2005), World Economic Outlook Database, Sept. 2005

■ Institutional development among the BRICs: technological innovation

- With the exception of Russia, the BRICs possess high potential regarding technological innovation relative to their income levels [Chart 4-7]. However, there is still a considerable gap in absolute terms with developed countries.
 - **Technological readiness:** India is commended for its technological capability. However, judging from the spread of IT, there is still a large gap in technological readiness among corporate enterprises and workers.
 - **Business sophistication:** Relative to their income levels, India and Brazil receive high appraisal for the quantity, quality and marketing capabilities of local parts industries. However, the competitiveness of the BRICs stems mainly from price competitiveness at the moment.
 - **Innovation:** In relation to their income levels, all the BRICs countries receive more or less high appraisal for their quality of research institutions, enthusiasm for R & D investment and business-academia collaboration. Even so, the number of patents acquisitions is still low, revealing a gap with the developed countries [Chart 4-8].

Chart 4-7 Institutional development among the BRICs (2)



Sources: World Economic Forum(2005), Global Competitiveness Report 2005-2006, World Economic Outlook Database, Sept. 2005

Chart 4-8 US patent acquisitions

(Acquisitions/1 million persons)

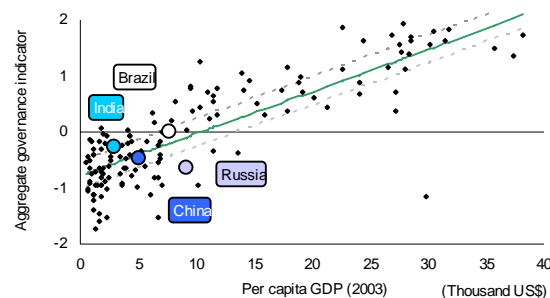
Ranking	Country /Region	No. of patent acquisitions
1	US	283.7
2	Japan	276.6
3	Taiwan	263.9
4	Switzerland	177.4
5	Finland	176.5
39	Russia	1.2
50	Brazil	0.6
56	India	0.3
58	China	0.3

Note: 2004.
Source: World Economic Forum (2005), "Global Competitiveness Report 2005-2006."

■ Institutional development among the BRICs: quality of "governance"

- In absolute terms, the quality of "governance" among the BRICs is not high [Charts 4-9, 10]. Relative to its level of income, Russia faces considerable challenges.
 - Brazil: the quality of "governance" is commensurate to its income level. In absolute terms, it is equivalent to the global average.
 - Russia: the quality of "governance" is low both in relative terms to income and in absolute terms.
 - India: albeit low in absolute terms, it guarantees the freedom of speech despite being a low-income country.
 - China: ranks considerably lower than other countries having the same level of income.

Chart 4-9 Comprehensive assessment of the quality of "governance"



Sources: Kaufmann et. al. (2005), "Governance Matters IV,"
World Economic Outlook Database, Sept. 2005

Chart 4-10 Constituent factors of the quality of "governance" and its assessment

Indicators	Brazil			Russia			India			China			Global average
	Absolute level	Gap with theoretical level	Evaluation	Absolute level	Gap with theoretical level	Evaluation	Absolute level	Gap with theoretical level	Evaluation	Absolute level	Gap with theoretical level	Evaluation	
Government effectiveness	0.02	0.33	△	- 0.21	- 0.36	△	- 0.04	0.99	○	0.11	0.92	○	0.03
Political stability	- 0.13	0.24	△	- 0.85	- 1.15	×	- 0.81	- 0.40	△	- 0.07	0.62	○	- 0.14
Rule of law	- 0.21	0.06	△	- 0.70	- 1.17	×	- 0.09	1.10	○	- 0.47	- 0.03	△	- 0.06
Control of corruption	- 0.15	0.12	△	- 0.72	- 1.20	×	- 0.31	0.60	○	- 0.51	- 0.13	△	- 0.03
Regulatory quality	0.19	0.52	○	- 0.51	- 0.76	×	- 0.59	- 0.17	△	- 0.45	- 0.20	△	0.01
Voice and accountability	0.34	0.71	○	- 0.81	- 0.91	×	0.27	1.00	○	- 1.54	- 1.53	×	- 0.08

Note: The "gap with theoretical level" = gap between theoretical figure (derived by regression of the absolute value and per capita GDP in 2003 (based upon PPP) and the absolute level, divided by the standard error. Gaps larger than and including 0.5 are evaluated as "○", gaps less than 0.5 are evaluated as "x". The "global average" is the average of the absolute levels of 141 countries and regions of the world.
Sources: Kaufmann et. al. (2005), "Governance Matters IV," World Economic Outlook Database, Sept. 2005.

(3) Conditions for sustainable development

■ Further institutional improvement is the key to sustainable development

- According to the IMF, countries achieving success in the following tasks tend to succeed in institutional reform: (1) the elimination of vested interests by opening markets and guaranteeing freedom of the press, and (2) the creation of human resources capable of institutional reform by raising the level of education.
 - India ranks relatively low in terms of how open its markets are. Russia and China face serious problems regarding the freedom of press [Chart 4-11]. In terms of education, Brazil ranks low both in absolute and relative terms to its income level. The absolute level of education is low in both China and India.

Chart 4-11 BRICs trade barriers (2004)

(%)

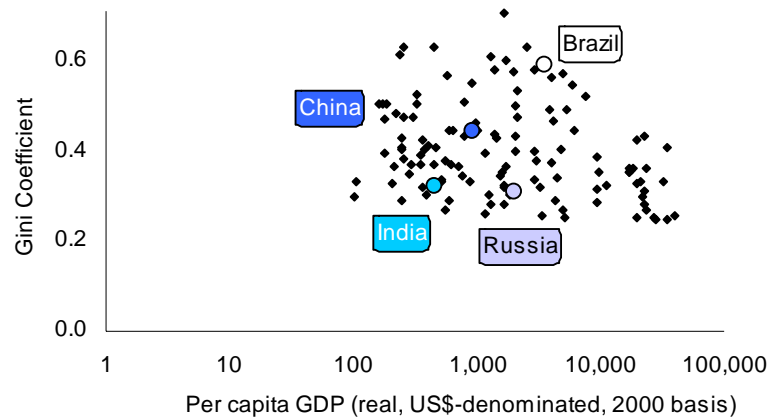
Country		Brazil	Russia	India	China
Concession rate		100.0	-	73.8	100.0
Simple average tariff rate	Tariff concession rate	31.4	-	46.1	10.0
	Priority rate of duty	13.2	10.4	28.3	9.8
Weighted average tariff rate		8.0	8.7	28.0	6.0
Share of items with tariff rates above or equivalent to 15%		38.0	8.4	92.4	16.0
Effect of non-tariff barriers (converted to tariff rates)		2.4	-	3.2	1.5

Note: Figures on Russia are as of 2002. "Effect of non-tariff barriers" are estimates as of 2000.
 Source: The World Bank (2005), "World Development Indicators."

■ Closing the income gap and resolving poverty

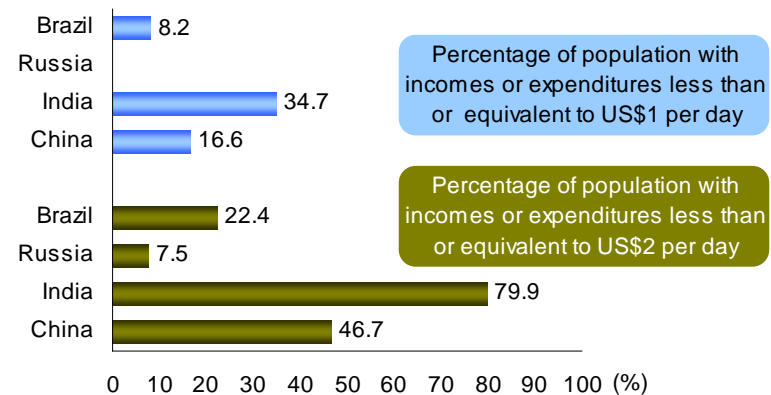
- Gaping Income disparities require rectification in Brazil and China [Chart 4-12].
- Although India does not have such a large income gap, it has a high poverty ratio in terms of global standards [Chart 4-13].
- The need to improve and raise the efficiency of social security systems.
 - In China, there is a significant lag in social security system development in rural areas. The rate of social security coverage is low even in urban areas. Although social security expenditures are so large in Brazil that they are a cause of budget rigidity, large regional and occupational disparities are serving as impediments to concrete measures (such as medical care).

Chart 4-12 The Gini coefficient



Source: The World Bank, "World Development Indicators 2005."

Chart 4-13 Poverty ratio



Note: Brazil (income as of 2001), China (expenditures as of 2001), India (expenditures as of 1999) and Russia (expenditures as of 2002).

Sources: The World Bank (2005), "World Development Indicators."