

India, China, and the Global Economy in a Turbulent World

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Climate Change and
the Environment**

Six part structure

Part 1: A decade of challenge and risk

Part 2: Changing growth and structure

Part 3: China changes course and India accelerates

Part 4: A new energy-industrial revolution

Part 5: From the planetary to the micro-micro

Part 6: Implications for international economic relations

A decade of challenge and risk (I)

- The global economy faces a decade of great challenges and risks. In this decade we have to handle:
 - (i) major macroeconomic structural imbalances (some emerging market economies exporting relatively 'safe' capital and importing relatively 'risky' capital);
 - (ii) debts and deficits in rich countries.
 - (iii) unfinished financial sector reform;
 - (iv) fragile growth in many countries;
 - (v) radical changes in international division of labour and skills that go far beyond the relocation of low-cost manufacturing that we have seen in the last few decades;
 - (vi) beginnings of a new energy-industrial revolution: a much more attractive path than trying to resuscitate business-as-usual.

A decade of challenge and risk (II)

- We will do better if we address these great challenges and risks in a coherent and integrated way (both as issues and as a world), rather than separately.
- For example, without a resumption of economic growth in countries most strongly affected by the financial and economic crises, the issues of deficit and debt cannot be resolved.
- But the path to a resumption of growth must be sustainable, low-carbon and foster the new energy-industrial revolution, or the impacts of climate change and environmental degradation will impact growth and development.

Six part structure

Part 1: A decade of challenge and risk

Part 2: Changing growth and structure

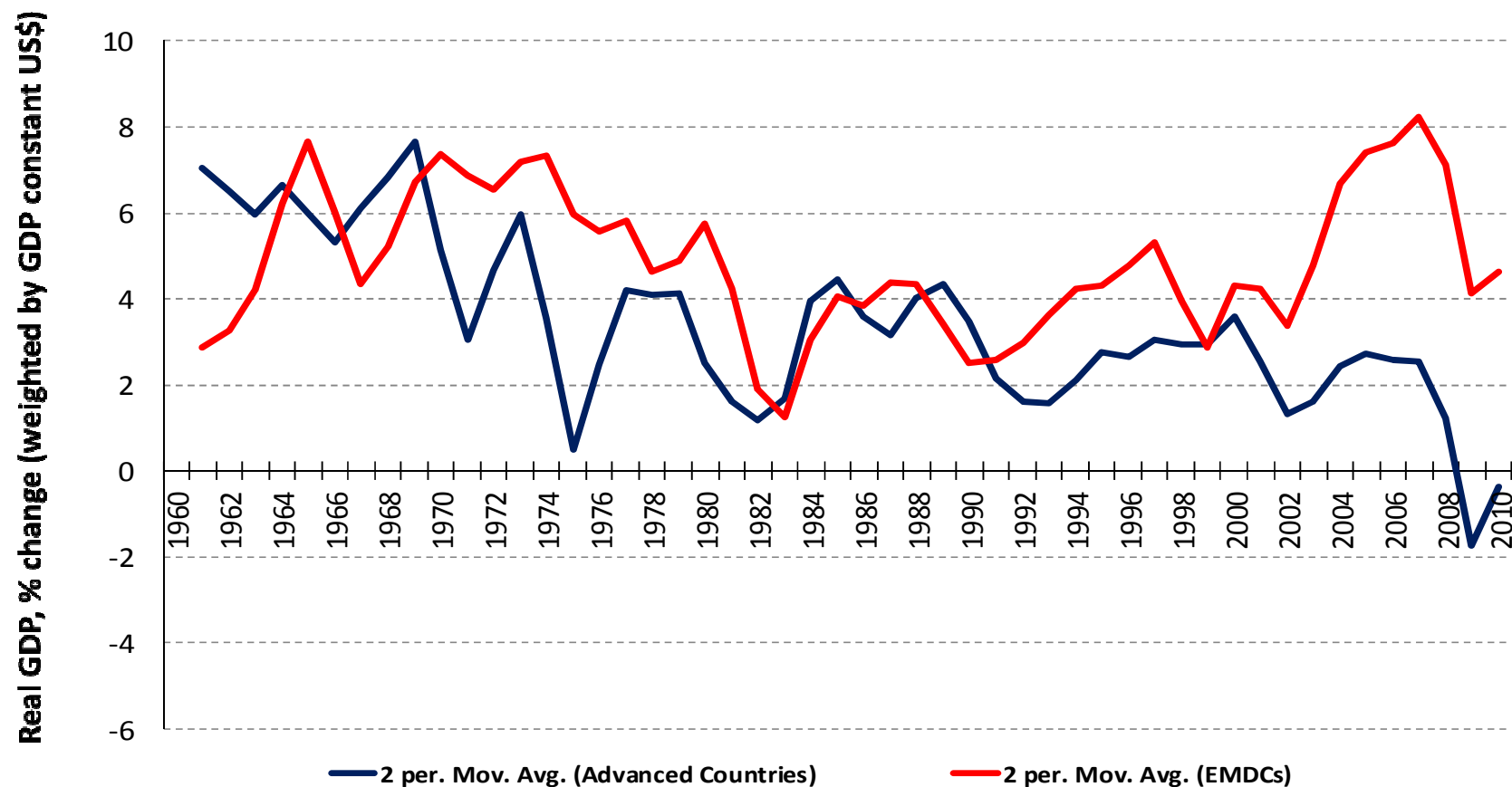
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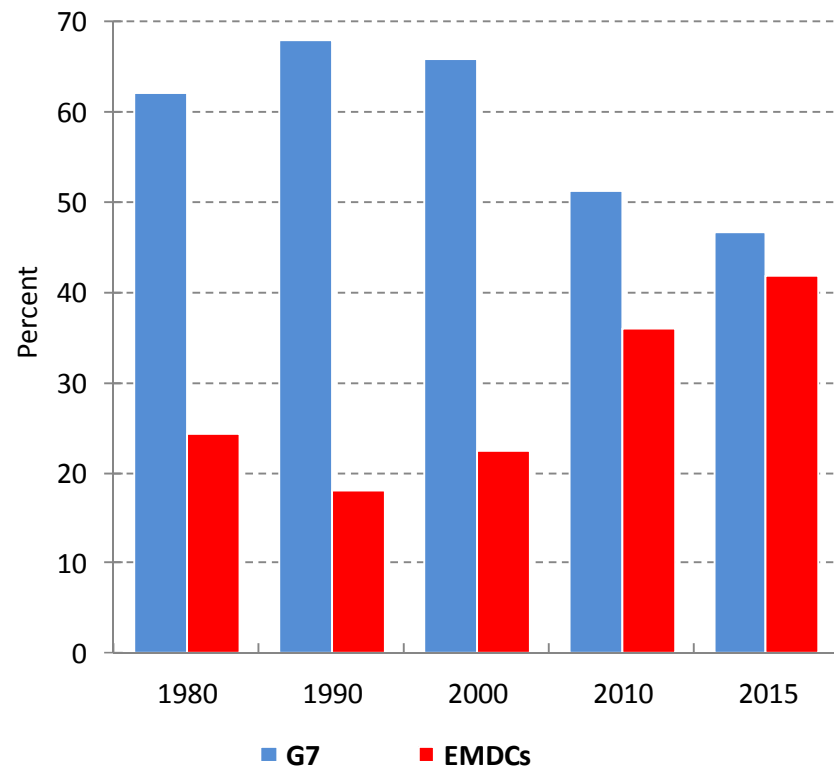
Part 6: Implications for international economic relations

Changing growth and structure (I): Growth of advanced economies & EMDCs

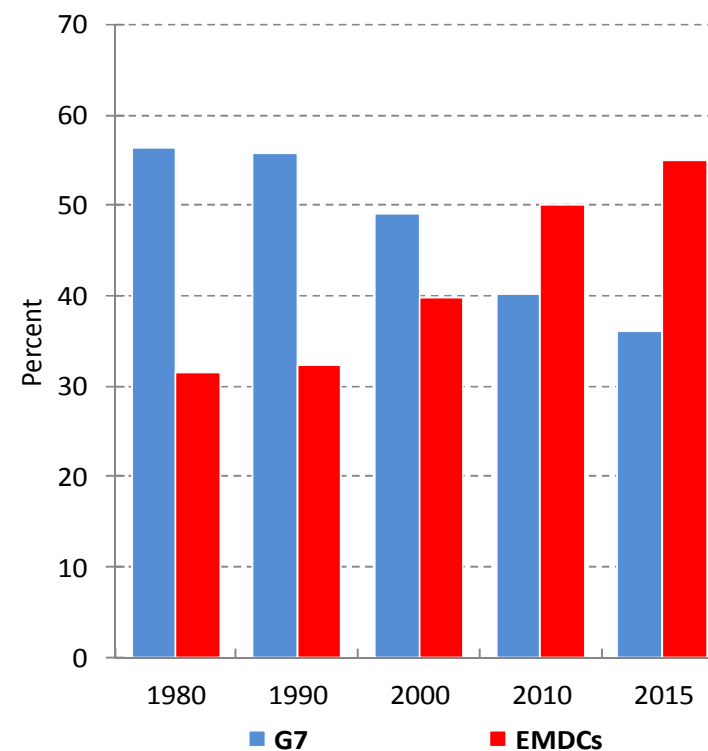


Changing growth and structure (II): Changing economic landscape

- Share of GDP at Market Prices



- Share of GDP at PPP



Changing growth and structure (III): Contributions to growth by decade

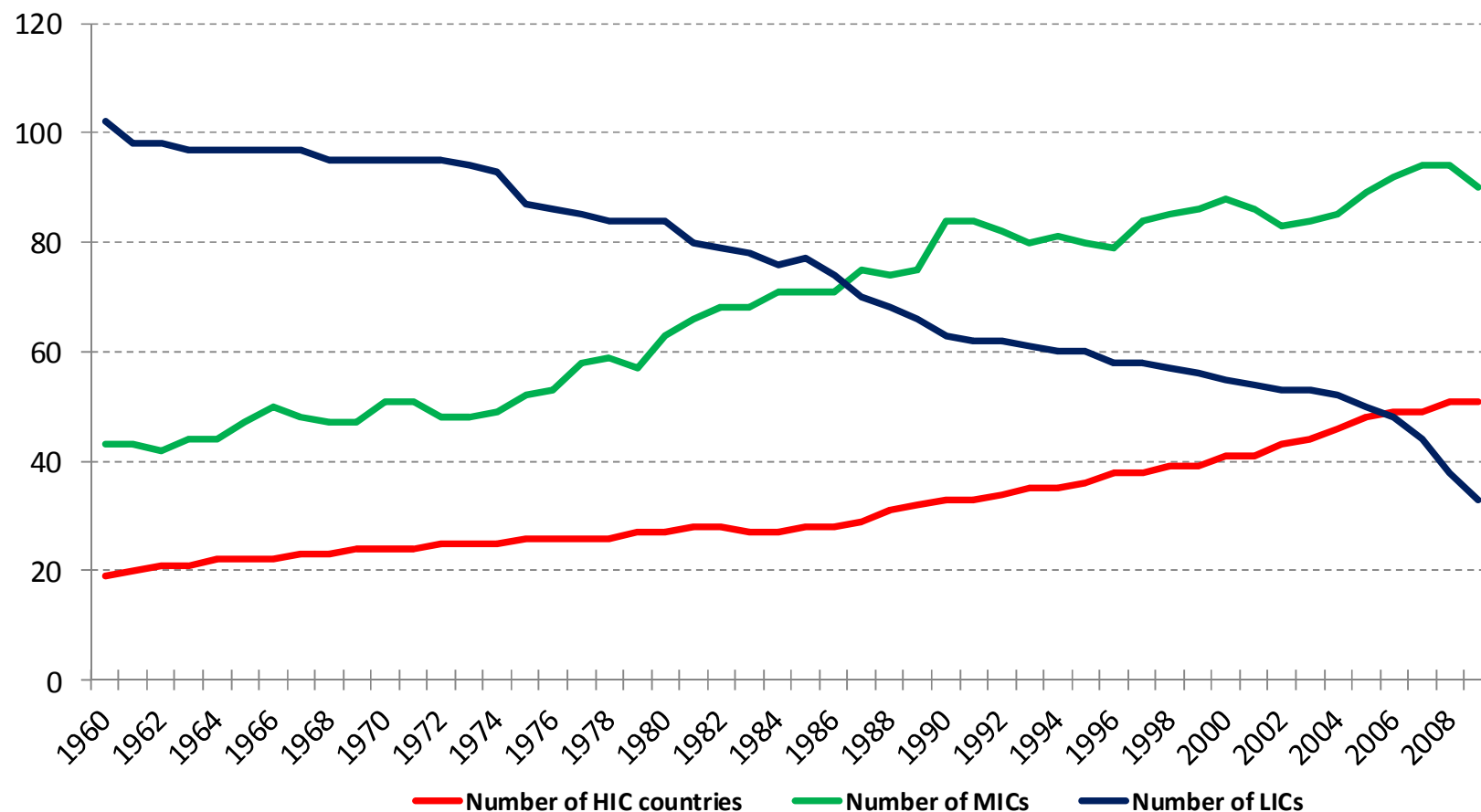
Rank	Country	1980 to 1990*	Country	1990 to 2000	Country	2000 to 2009
1	USA	26.8%	USA	36.0%	China	25.5%
2	Japan	21.1%	China	9.6%	USA	21.5%
3	Germany	4.4%	Japan	6.6%	India	6.1%
4	UK	3.8%	Germany	4.5%	Korea, Rep.	3.2%
5	China	3.6%	UK	4.2%	Brazil	3.1%
6	France	3.2%	Korea, Rep.	3.0%	UK	3.1%
7	Italy	2.8%	France	3.0%	Japan	3.0%
8	Korea, Rep.	2.3%	India	2.4%	France	2.1%
9	Canada	1.8%	Canada	2.3%	Russian Fed.	2.0%
10	India	1.6%	Mexico	2.1%	Spain	2.0%
11	Spain	1.5%	Italy	2.0%	Australia	1.9%
12	Australia	1.2%	Brazil	1.8%	Canada	1.8%
13	Turkey	1.0%	Spain	1.8%	Argentina	1.7%
14	Brazil	1.0%	Australia	1.5%	Germany	1.4%
15	Mexico	0.9%	Netherlands	1.3%	Indonesia	1.4%

*Not included: Russian Federation nor FSU nor ECA former Communist states, for 1980 to 1990 period.

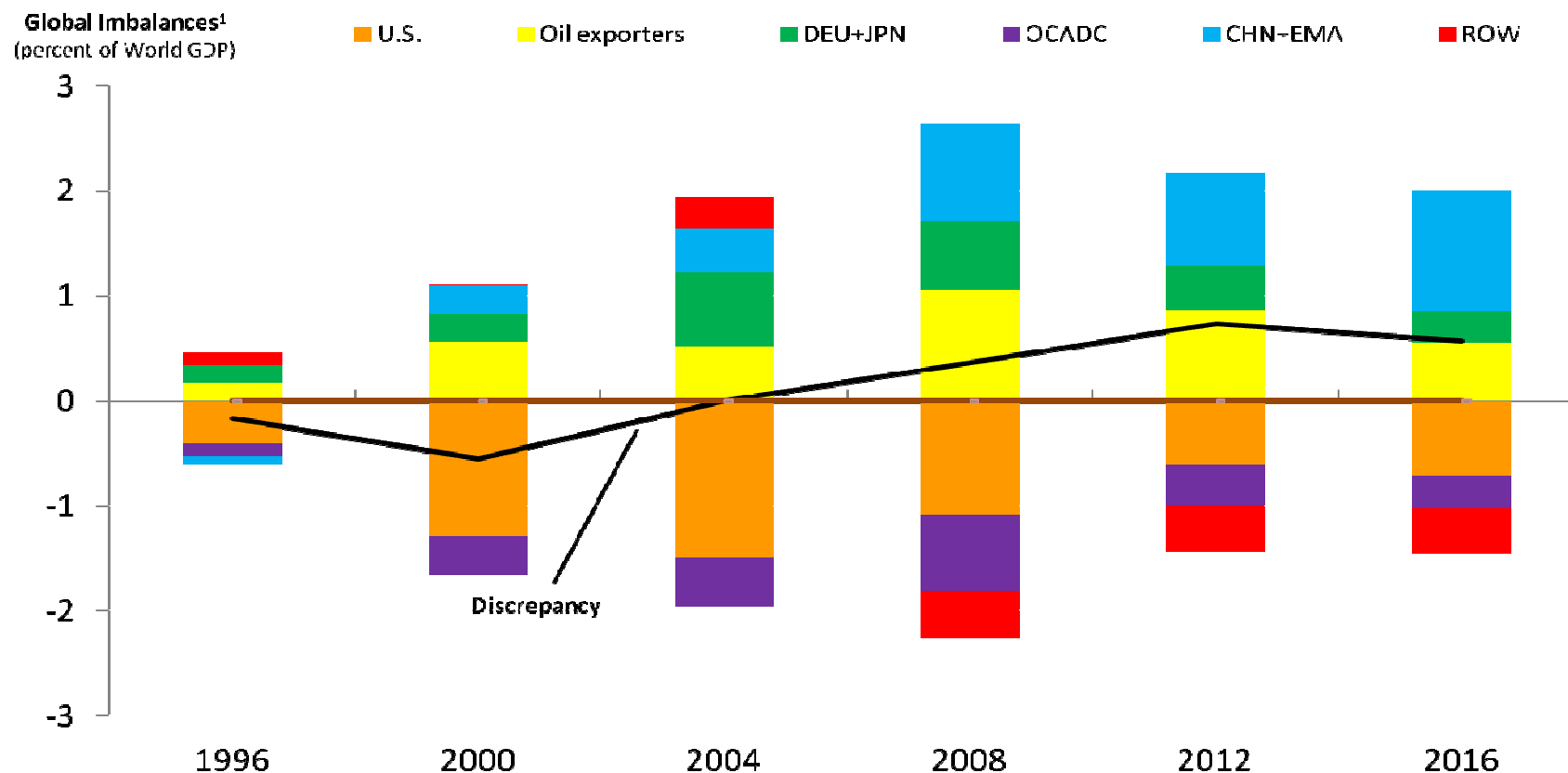
Changing growth and structure (IV): Dispersion of growth

	Average Growth 2003-2008			Average Growth 2010-2015		
Growth	>5%	3-5%	<3%	>5%	3-5%	<3%
Advanced Economies	0	8	17	0	4	21
Emerging and Developing Countries	92	39	27	62	68	27
HIC	12	5	5	2	11	9
MIC	61	29	13	39	45	19
LIC	19	4	10	21	12	0
East Asia and Pacific	12	3	4	13	2	5
Europe and Central Asia	21	2	0	7	14	2
Latin America and the Caribbean	12	12	5	7	13	9
Middle East and North Africa	6	5	1	2	8	2
South Asia	7	1	0	6	2	0
Sub-Saharan Africa	22	8	13	23	19	1
Total	92	47	44	62	72	48

Changing growth and structure (V): Convergence - movement across income groups



Changing growth and structure (VI): past and projected global imbalances



¹ **CHN+EMA**: China, Hong Kong SAR, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, and Thailand; **DEU+JPN**: Germany and Japan; **OCADC**: Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Ireland, Latvia, Lithuania, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Turkey, and United Kingdom; **ROW**: rest of the world; **US**: United States.

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China changes course (I)

- China's 12th five year plan identifies two key objectives or transitions:
 - Increasing the share of consumption and moving to a low-carbon economy.
- Two indicators could help to guide and measure progress:
 - Incremental Capital-Output Ratio (ICOR);
 - Relationship between greenhouse gas emissions and output (emissions intensity).
- These transitions are essential and will be full of opportunity, creativity and investment: China will focus strongly on innovation.
- They will involve complex but exciting dynamic processes.
- Growth may slow as change accelerates (lower growth rate target of 7% in 12th plan reflects this).
- Can China deliver?

China changes course (II)

- China can reduce the ICOR (increase the productivity of capital), by:
 - i changing structure towards industries with a lower capital requirement;
 - ii using capital, and generally producing, more efficiently in each industry;
 - iii allocating capital more efficiently across industries;
 - iv increasing skills and employment;
 - v technical progress.
- With the strongest effects coming from structural change, by 2030 the combination of these factors could perhaps reduce the ICOR from around a little over 4 now to a little over 3.
- This would enable China to reduce its (net) investment rate from around 40% today, to around 30%, while maintaining the economic growth rate and increasing household consumption.

China changes course (III)

- China has indicated a cut in emissions per unit of GDP (emissions intensity) of 40-45% 2005-2020:
 - The 12th plan - **17%** reduction (target);
 - The 13th plan - **17%** reduction (assumed);
 - To reach the 45% would require that the 11th plan had cut emissions intensity by **20%.*** Given that the energy intensity (energy/output) target was achieved in the 11th plan (c.19%) China seems on course for the 45%.
- Take 9 billion tonnes CO₂e approx. as 2010 emissions, output 7% growth p.a. and a 31%** reduction in emissions intensity 2010-2020:
 - **12 billion** tonnes CO₂e in **2020**
 - **15 billion** tonnes CO₂e in **2030** (if add further 3 billion tonnes 2020-2030)
- *World* emissions budget for 2°C path (with 50% probability) is around 30-32 billion tonnes in 2030. China would be close to half of world target with 20% of population.
- World target would likely be out of reach unless China could peak at around 13-14 billion tonnes in early 2020s and return to around 9 billion tonnes p.a. by 2030.
- Implies cut in emissions intensity by around a factor of four by 2030, or 29%, on average, over each of the next four 5-year plans.

China change course (IV)

Inequality in China

- China has seen rapid growth over the last few decades but also growing inequality.
- In 1981, when national surveys began, China had one of the highest proportions of the population living in poverty in the world.
- In 1981 around 85% of the population lived below a poverty line of \$1.25 per day in 2005 prices (headcount index). By 2005 only around 15% of the population lived below the poverty line.
- In contrast, inequality was low at the start of China's reform period, with growth in agriculture in the first half of the 1980s contributing the most to reductions in poverty and inequality. However, inequality increased greatly from the mid-1980s.
- The Gini index rose from .29 in 1981 to .42 in 2005.
- Important spatial dimensions to inequality in China. Coastal provinces have seen far greater growth and poverty reduction than inland provinces - trend rate of decline in headcount index in inland provinces less than half of coastal provinces.

India accelerates (I)

India's pattern of accelerating growth

- Three major phases of Indian growth:
 1. Post independence and until 1980, GDP growth averaged around 3.5% p.a.
 2. Post 1980 growth exceeded 5% p.a.
 3. Post 2003 growth accelerated to above 8% p.a.

Table 1 - Indian Growth Performance, 1980-2009

Year	Average(5 years)		Average (20 years)	
	Growth	Rank	Growth	Rank
1980	3.2	56	3.7	60
1985	5.4	19	4.1	35
1990	6.0	12	4.3	27
1995	5.2	28	4.9	17
2000	6.3	11	5.7	11
2005	7.0	7	6.1	6
2009	8.5	4	6.5	4

Source: World Bank, World Development Indicators

India accelerates (II)

India's pattern of accelerating growth

- The “Hindu” rate of growth of 3.5%, together with a population growth rate of over 2%, over the period 1950-80, has long gone.
- In the 1980s the 5-6% growth rate was accompanied by a fall in the annual population growth rate, now down to 1.4% and falling.
- The acceleration of growth to around 8-9% from 2003-04 can be partly explained by the opening-up of the economy and increased competitiveness, but also high investment/savings rates. Investment rates have increased from an average of 25% in the 1990s to more than 35% since 2004-05.
- India has sustained these high growth rates of 8-9% despite the global slowdown and continuing economic crises.

India accelerates (III)

India's pattern of accelerating growth

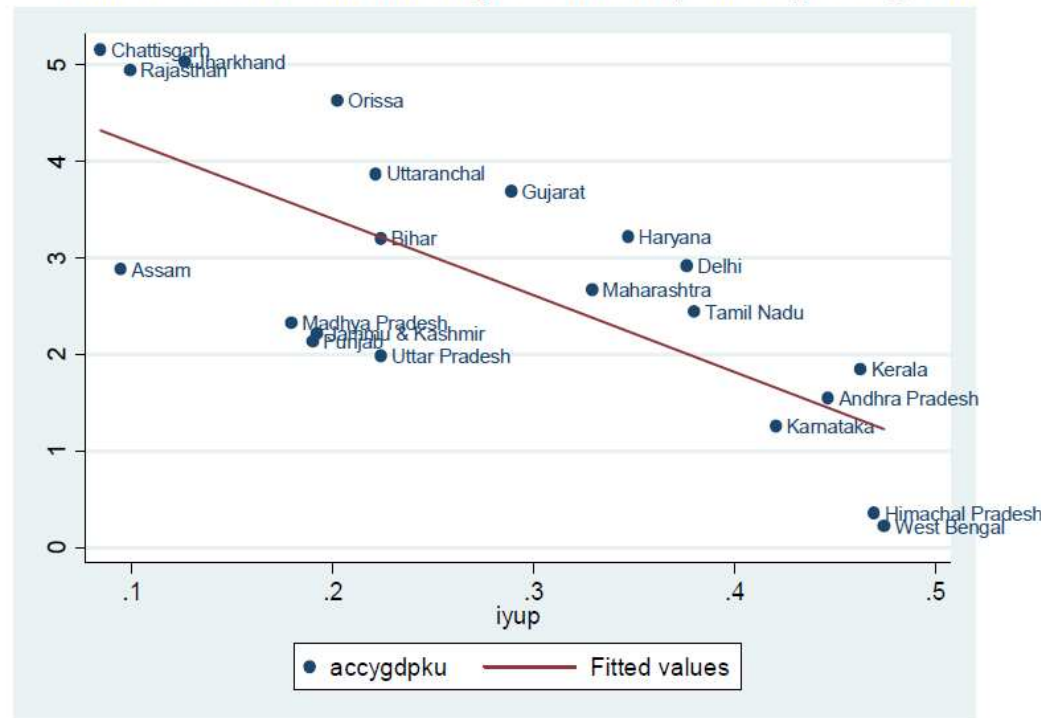
- Can the pace of growth in India continue? Can India keep up the savings ratio, which has been driven by a swing towards profits?
- If India can keep up the investment savings ratio whilst reducing the capital-output ratio (increasing the productivity of capital) this will allow for faster growth.
- $(\Delta Y/Y) = (\Delta K/Y) \div (\Delta K/\Delta Y)$. Growth rate equals investment rate divided by ICOR
- However, if India is unable to keep up the investment savings ratio, then without improvement in the productivity of capital, growth will likely fall.
- Does this effect mean greater inequality drives higher growth?
- Ravallion (2009) and Bhalla (2011) argue to the contrary: greater inclusion drives greater growth. Lagging regions and groups slow growth.
- Will inflation and international crisis derail?

India accelerates (IV)

India's pattern of accelerating growth

- Bhalla (2011) finds that there is much scope for catch-up of backward regions. with poorer states that grew slower in the 1993 to 2002 period growing faster in the recent growth acceleration phase that started in 2003-04.

Chart 1: Acceleration more rapid in formerly slower growing states



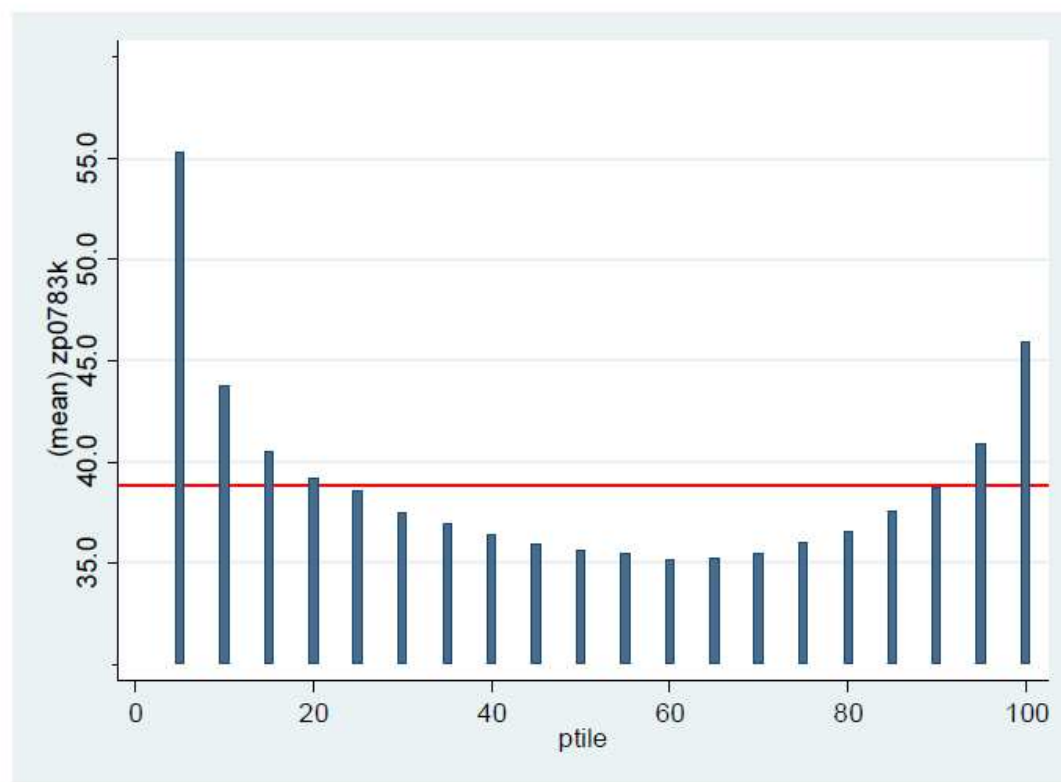
Notes: X axis represents per capita growth during the period 1993-2002; the Y axis is the acceleration in per capita growth 1992-2009 i.e. growth 2003-2009 minus growth 1993-2002.

India accelerates (V)

India's pattern of accelerating growth

- Consumption growth rates of poorer groups (bottom percentiles) are similar to the rich (top percentiles), consistent with a story of fairly constant inequality over time.

Chart 2a: Pattern of growth in real NSS unadjusted consumption, 1983 to 2007/8



India's 12th plan

- **Growth** – objective of faster, sustainable, and more inclusive growth: 9 or 9.5% p.a. target for 12th plan being considered (considerations of savings/investment rates and inflation key here).
- **Energy** – a GDP growth rate of 9% p.a. will require energy supply to grow at around 6.5% p.a. over the 12th plan. Aim to add 100GW of new generation capacity over 12th plan, largely thermal. Energy efficiency will be a priority. Removing energy price subsidies also under discussion.
- **Transport** – rapid growth will require large investments in roads, railways, ports and civil aviation. Both for increasing capacities and modernisation. Both public and private finance will be necessary.
- **Sustainable management of natural resources** – the 12th plan will recognise the pressure of growth on natural resources and the need to exploit these in a sustainable manner. Management of finite land and water resources will be a key focus.
 - The inter-sectoral **Expert Group on Low-Carbon Strategies for Inclusive Growth** will report prior to the 12th plan on finance, technology and policy options for a transition to a low-carbon, inclusive growth path.

India's 12th plan

- **Rural transformation and the farm sector** – with 833 million people involved in the farm sector, the 12th plan will focus on expanding employment and income opportunities, both on- and off-farm. The 12th plan will continue to support a number of rural development programmes that will improve infrastructure and improve health, education and skills.
- **Manufacturing sector** – development of a broad strategy and plans to help increase the growth and competitiveness of India's manufacturing sector, which has underperformed relative to the services sector. Growth of 12-14% p.a. to achieve a share of 25% of GDP by 2025, and the creation of 100 million jobs by 2025 is proposed, along with a focus on a number of priority sectors.
- **Health** – aim to raise total public health expenditure to 2.5% of GDP by the end of the 12th Plan. Much reform of the system is planned to improve delivery of India's 7 strategic health priorities.
- **Education and skill development** – the 12th plan aims to strengthen the education system at all levels, with children a major focus.
- Also objectives around social and regional equity, urbanisation, science and technology, the services industry, governance, and innovation.

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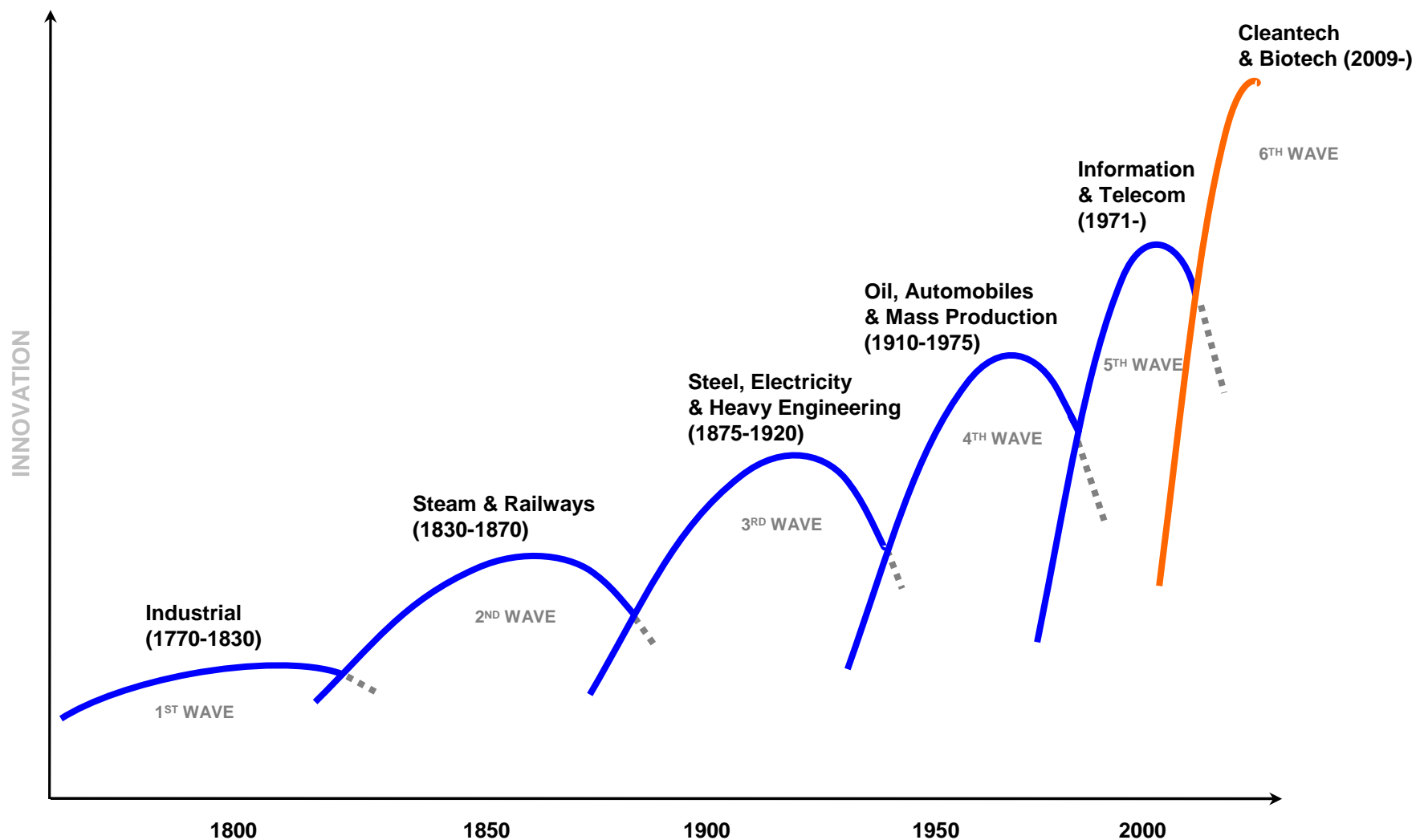
The new energy-industrial revolution and low-carbon growth (I)

- Unless the world embarks now on a new energy and industrial revolution and a transition to a low-carbon economy and society, it will be very difficult to manage the huge risks of climate change.
- An attempt at high-carbon growth will kill itself as a result of the hostile environment it will create – probably hundreds of millions displaced. Likely consequences are extended, severe and global conflicts. It is not a credible medium-term option for growth.
- India is particularly vulnerable to the impacts of climate change with its large fraction of the population near the coast, its pressures on water supply, its dependence on the Himalayan region as a water source and on the patterns of monsoons, and the location of the many populous countries along its northern borders.
- Will require strong action in all regions of world, including India, and in all economic sectors.

The new energy-industrial revolution and low-carbon growth (II)

- To achieve the 2°C target, world emissions must be cut by factor of close to 2.5 (from nearly 50 billion tonnes in 2010 to around 44 billion tonnes in 2020, to around 30-35 billion tonnes in 2030 and to well below 20 in 2050).
- If world output grows by a factor of 3 over this same period, then emissions/output must be cut by a factor of 7 or 8.
- Surely an industrial revolution by any definition.
- New industrial revolution and the transition to low-carbon growth constitute a very attractive path.

Waves of innovation



The new energy-industrial revolution and low-carbon growth (III)

- Likely to bring two or three decades of dynamic, innovative and creative growth, and large and growing markets for the pioneers.
- Probably similar, or larger, growth effects, to railways, electricity, IT in earlier eras.
- When achieved, low-carbon growth will be more energy-efficient, more energy secure, more equitable, safer, quieter, cleaner and more bio-diverse. Far more attractive than what has gone before.
- Great potential to improve India's living standards and quality of life, especially for local communities and the poorest in Indian society.

The new energy-industrial revolution and low-carbon growth (IV)

- For example, at a local level, rapid cost reductions and technological advances in solar power present a real opportunity to bring electricity to the 400 million or so people in India who are currently without power.
- Decentralized solar power avoids many of the costs and problems around traditional high-carbon infrastructure such as grid connection and exploitation.
- Decentralised renewable power provides both low-carbon electricity and empowers local communities. It can enable both children and adults to study at night. It can enable women to establish businesses.
- We should not pretend that such changes would be easy. There are many barriers, including vested interests.
- However, none is insurmountable, and overcoming these obstacles is part and parcel of the transition towards a more sustainable low-carbon development path.

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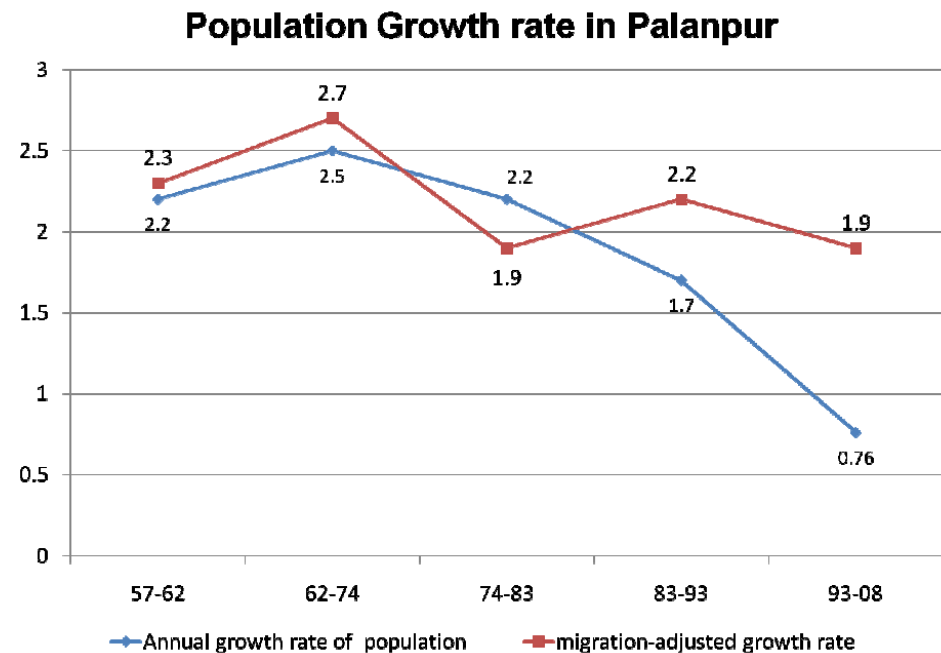
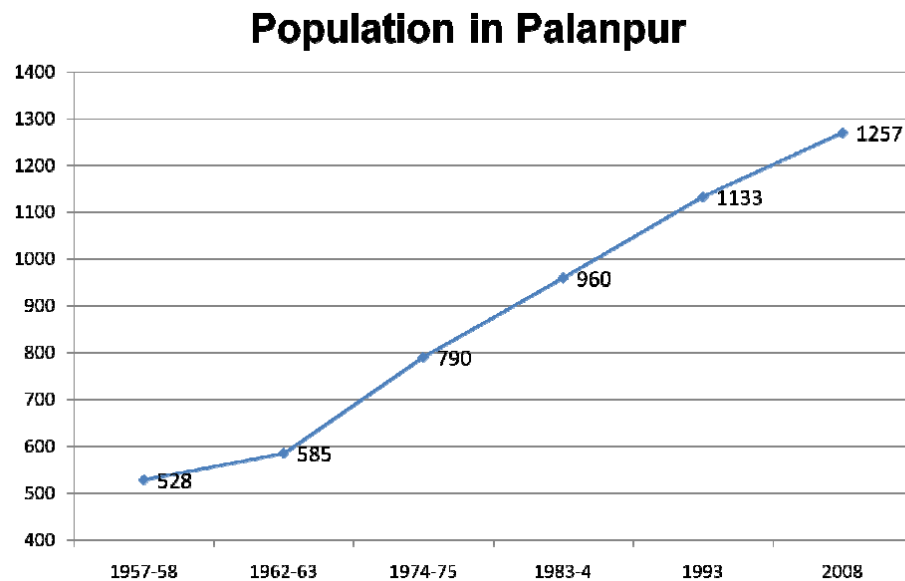
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Drivers of change in Palanpur (I)

- Key drivers of change in Palanpur:
 - population and demographics;
 - agricultural change;
 - non-farm opportunities.
- In the 1950s, 1960s and 1970s, it appears that the first two were of particular importance.
- Over the last 25 years or so, off-farm activity appears to be becoming the dominant driving force for change in the village of Palanpur.
- Evidence from elsewhere suggests this is true of India as a whole.

Drivers of change in Palanpur (II)

Population



Drivers of change in Palanpur (III)

Population

Table 2: Literacy rates by caste and gender

Caste	% of literates (7+) [Male]					
	1957-58	1962-63	1974-75	1983-4	1993	2008
Thakur	41	59	62	48	56	75
Murao	11	29	42	37	39	65
Muslim	5	20	10	23	20	52
Jatab	3	12	3	4	12	28
Kayasth	100	100	100	100	100	100
Other	14	33	26	23	38	58
All Castes	18	34	34	30	37	58
	% of literates (7+) [Female]					
	1957-58	1962-63	1974-75	1983-4	1993	2008
Thakur	0	8	11	8	19	39
Murao	0	3	0	1	2	20
Muslim	0	0	0	2	2	15
Jatab	0	3	0	0	0	6
Kayasth	67	50	67	100	100	100
Other	0	3	4	4	8	28
All Castes	0.5	3	6	6	9	23

Drivers of change in Palanpur (IV)

Agriculture

- Agriculture remains the most important source of income for households. But agriculture is the sole source of income in only 23% of households.
- Land owned per capita has fallen due to land sales and a growing population.
- However, additional capital, new high-yielding crop varieties and mechanisation has seen an intensification of land-use and rising yields.
- This has allowed a reduction in labour input: labour has been released into non-farm activities.
- Net leased-in area for the village as a proportion of operated area: 2% in 1983-84; 13 % in 2008-09. Gross area much higher. Amount of leased-in influenced by land owned, family members available to work in agriculture and ownership of agricultural equipment.

Drivers of change in Palanpur (V)

Outside employment/non-farm income

- Increase in outside jobs: continuation of the earlier trend of commuting from village.
- Most outside jobs casual with little growth in regular jobs.
- Significant growth in service sector income related to machinery.
- Most migrants belong to richer classes: very little migration among Jatabs.
- For Jatabs and Muslims, commuting is still the dominant form of accessing outside jobs.
- Non-farm income also arises within the village including from renting out tractors and land for cash

Drivers of change in Palanpur (VI)

Outside employment/non-farm income

- In contrast to the past, Thakurs are migrating out of the village.
- Jatab's involvement with the outside world has gone up, both in terms of migration and outside work, more so in case of the latter.
- Closer integration with the outside labour market has strengthened bargaining power of Jatabs in the village labour market.
- Significant wage increase since 2006.
- Outside employment, rather than agricultural productivity & NREGA-led intra-village work opportunities, appear to be the most important influence.

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Implications for international economic relations (I)

- Improvements in quality of life across the world over the coming decade, including overcoming poverty, and managing climate change and fostering the new energy-industrial revolution, will require investment on a great scale in the developing world.
- The necessary investments, many of them infrastructure, require finance on a comparable scale and in ways that are tailored to the risks and challenges.
- Risks to these possibilities include fragile macroeconomic prospects, failure of markets to allocate funds to good investments, and prospective climate damages if the world continues on a high-carbon path.
- A south-south collaboration, for example in the form of international financing, may help to facilitate the necessary investments and reduce these risks and dangers. Would also help to manage international macro-economic imbalances.

Implications for international economic relations (IV)

- There is great scope for south-south collaboration, especially around the elements of global public goods/externalities.
- Enhanced collaboration possible across a range of areas including on resource management (including efficiency), climate change, global instability, technology, education, world trade, etc.
- The new reality of the size, growth and increasing sophistication of emerging-market and developing countries means they have much to contribute to each other and much to gain both in the shorter term and the longer run from greater collaboration.
- Would there be suspicion and possible protectionism amongst emerging market countries?
- How might rich countries react? Would there be a danger of protectionism?

Conclusion (I)

Risks

- Coming decade full of great opportunities but also great risks.
- Rich countries at risk of prolonged stagnation; may be protectionist.
- Emerging market countries growth may slow from reduced external opportunities and internal tensions.
- Emerging market countries may fall out amongst themselves and fail to collaborate.
- Challenges of management of urbanisation.
- Rapid population growth in Africa.
- May lock-in so much high-carbon capital and infrastructure that 2 deg C is out of reach.

Conclusion (II)

Opportunities

- There is a different path if policies are sound and there is international collaboration.
- Sensible growth policies in rich countries focused on growth, investment and sound path to fiscal responsibility.
- Structural transition in China towards consumption and low-carbon, strong infrastructure investment in India and growth oriented – macro together with better public service delivery.
- World leadership from China, India and emerging/developing nations on international macro, trade and the new energy industrial revolution.
- They have become powerful before becoming rich. Their leadership essential to their own and world progress. But no substitute for rich countries taking their responsibilities – action by rich and emerging/developing countries complements and part of a whole.
- Vital decade for the world – India must look outwards for collaboration as well as inwards for reform to sustain growth and development.