Beyond the Hype?

The World in 2050

Source: Goldman Sachs
Three key points

1. Putting India’s Socio-Economy Journey in perspective?

2. Addressing the Fundamentals: Several Crucial Challenges?

3. Call for a New Paradigm: India as an incubator not extender of 20th century models
Three key points

1. Putting India’s Socio-Economy Journey in perspective?

2. Addressing the Fundamentals: Several Crucial Challenges?

3. Call for a New Paradigm: India as an incubator not extender of 20th century models
Since independence, 60 + years of Experimentation

Independence of India 2010

Socio-economic experiments
Freedom of Self Expression

1. Stabilized Democracy, secular system
2. Realization of Self, General sense of Confidence
3. Strengthened Balance Sheet
4. Growing Global Stature
5. Modernizing Industry
Close to 500,000 Villages has been electrified

Electrified Villages in India (1947-2012)\(^1\)

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947</td>
<td>1,500</td>
</tr>
<tr>
<td>1950</td>
<td>3,061</td>
</tr>
<tr>
<td>1970</td>
<td>74,000</td>
</tr>
<tr>
<td>1990</td>
<td>471,000</td>
</tr>
<tr>
<td>2003</td>
<td>494,000</td>
</tr>
<tr>
<td>2012</td>
<td>587,000</td>
</tr>
</tbody>
</table>

Boston Analytics Research
1. Ministry of Power (http://powermin.nic.in)
Thirty Times increase in per capita power consumption

Per Capita Power Consumption in India (1950-2012)\(^1\)

<table>
<thead>
<tr>
<th>Year</th>
<th>Per capita consumption of Electricity (KWh / year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>15.6</td>
</tr>
<tr>
<td>1960</td>
<td>34.8</td>
</tr>
<tr>
<td>1970</td>
<td>83.5</td>
</tr>
<tr>
<td>1980</td>
<td>130.5</td>
</tr>
<tr>
<td>1990</td>
<td>238.0</td>
</tr>
<tr>
<td>2001</td>
<td>408.0</td>
</tr>
<tr>
<td>2012</td>
<td>932.0</td>
</tr>
</tbody>
</table>

\(30 \text{ times}\)

Boston Analytics Research
1. Ministry of Power (http://powermin.nic.in)
Emerging Global Presence

Emerging Multinationals from India (not comprehensive):
1. Bharat Forge
2. Bajaj
3. Infosys
4. Sulzon
5. Tata Motors
6. Tata Steel
7. TCS
8. WIPRO
9. Several Bio & Pharma Firms

Multinationals with major R & D Centers in India (not comprehensive):
1. CISCO
2. GE
3. GM
4. Intel
5. IBM
6. Levers
7. Microsoft
8. Pfizer
9. Siemens
India is still at a very early stage of Economic development

80% of Global Population

Energy Consumption per Capita vs. GDP per Capita (2004)

India is still at a very early stage of Economic development
While gap between the top and base of the Pyramid is widening

Current Obstacles of Typical Socio-economic Pyramid

Inertia of past consumption habits

Widening Gap?

“End of life” high cost Applications

Single most significant Challenge of the 21st Century
Struggle between two Fundamental Philosophies

**Economic Philosophy**

- **Free Market**
  - *Market is the driver*
  - Best govt. is the least government

- **Centrally Controlled**
  - *State is the Driver*
  - Planning to allocate resources

*Where is the Power?*
Struggle between two Fundamental Philosophies

**Economic Philosophy**

**Free Market**

*Market is the driver*

*Best govt. is the least government*

1950s

**Centrally Controlled**

*State is the Driver*

*Planning to allocate resources*

60s ~ 70s

*Where is the Power?*
Two Fundamental Philosophies

**Economic Philosophy**

- **Free Market**
  - *Market is the driver*
  - Best govt. is the least government
  - 1950s

- **Centrally Controlled**
  - *State is the Driver*
  - Planning to allocate resources
  - 60s ~ 70s
  - Mid 80s
Two Fundamental Philosophies

Economic Philosophy

Free Market
- Market is the driver
- Best govt. is the least government
- 1950s
- 90s ~ 2000s

Where is the Power?

Centrally Controlled
- State is the Driver
- Planning to allocate resources
- 60s ~ 70s
- mid 80s
India’s Globalization & Liberalization moves

Partha S Ghosh & Associates Model

Degree of Openness

Low

Medium

High

Liberalization

Degree of market Orientation

1950s

60s ~ 70s

mid 80s

90s ~ 2000s

“Globalized Free market

Closed & Controlled

Globalization

Low

Medium

High

Boston International

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**Challenge 1: Economic Disparity**

- Income is 5 times higher in richest states than in the poorest states.
- 40% of villages lack access to roads.
- 400 M rural dwellers have no electricity.

Source: World Bank
Challenge 2: Continuing Negative Trade Balance

Net Trade Balance of India (1980-2006)\(^{(1)}\)

<table>
<thead>
<tr>
<th>Year</th>
<th>Trade Balance ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>-5.8</td>
</tr>
<tr>
<td>1981</td>
<td>-7.3</td>
</tr>
<tr>
<td>1982</td>
<td>-3.8</td>
</tr>
<tr>
<td>1983</td>
<td>-12.7</td>
</tr>
<tr>
<td>1984</td>
<td>-8.9</td>
</tr>
<tr>
<td>1985</td>
<td>-22.0</td>
</tr>
<tr>
<td>1986</td>
<td>-50.9</td>
</tr>
</tbody>
</table>


Boston Analytics Research

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**Challenge 3:** India is most vulnerable to the Uncertain Geo Political Energy Dynamics


- **Net Export of Energy (US$ B)**
- **Net Import of Energy (US$ B)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Net Export (US$ B)</th>
<th>Net Import (US$ B)</th>
<th>% Deficit/GDP</th>
<th>% Surplus/GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>-200</td>
<td>-25</td>
<td>-75</td>
<td>-50</td>
</tr>
<tr>
<td>Italy</td>
<td>-10</td>
<td>-25</td>
<td>-75</td>
<td>-50</td>
</tr>
<tr>
<td>Japan</td>
<td></td>
<td></td>
<td>-50</td>
<td>-100</td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
<td>-25</td>
<td>-20</td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td></td>
<td></td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Nigeria</td>
<td></td>
<td></td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
<td>-25</td>
<td>-20</td>
</tr>
<tr>
<td>Venezuela</td>
<td></td>
<td></td>
<td>-10</td>
<td>0</td>
</tr>
<tr>
<td>Algeria</td>
<td></td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Malaysia</td>
<td></td>
<td></td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Algeria</td>
<td></td>
<td></td>
<td>-10</td>
<td>0</td>
</tr>
<tr>
<td>Venezuela</td>
<td></td>
<td></td>
<td>-20</td>
<td>-10</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
<td>-25</td>
<td>-20</td>
</tr>
<tr>
<td>Russia</td>
<td></td>
<td></td>
<td>-10</td>
<td>0</td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>China</td>
<td></td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
</tbody>
</table>

**Boston Analytics Research**
1. International Energy Agency (http://www.iea.org)
3. Energy Information Administration (http://www.eia.doe.gov)

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**Red Zone**

India is most vulnerable to the Uncertain Geo Political Energy Dynamics.
**Challenge 4:** At 20% of UK’s per capita use India will need as much new capacity as its installed base?

[Diagram showing electricity consumption comparison between actual and at 20% per capita consumption of UK.]

---

**Boston Analytics Research**

1. Energy Information Administration - EIA (http://www.eia.doe.gov/)

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**Challenge 5:** Efficiency of existing Infrastructure - India can save almost $50 B

Utilization of Power in India in MW (2006)

- **Total Available Capacity:** 124,302 MW
- **Unutilized Capacity:** 49,721 MW (40%)
- **Inevitable and acceptable loss:** 4,972 MW (4%)
- **Power theft:** 3,108 MW (2.4%)
- **Poor infrastructure maintenance:** 15,538 MW (12.5%)
- **Total Power Available if working at 80% efficiency:** 50,963 MW
- **Total Power Available:** 99,442 MW
- **Savings of Rs 2,424 B**

**Utilization Breakdown:**
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- **Unutilized Capacity:** 49,721 MW (40%)
- **Inevitable and acceptable loss:** 4,972 MW (4%)
- **Power theft:** 3,108 MW (2.4%)
- **Poor infrastructure maintenance:** 15,538 MW (12.5%)
- **Total Power Available if working at 80% efficiency:** 50,963 MW
- **Total Power Available:** 99,442 MW

**Savings:**
- Savings of Rs 2,424 B

**References:**
1. “Power”, Motilal Oswal, 2005
2. “6 police stations to track power theft in Maharashtra”, (http://www.thehindubusinessline.com)

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**Challenge 6:** Land is dear but productivity (yield/ Ha) still remains low, in recent years declining

Population Density v/s Primary Crop Yield per Ha (2003)

Unhealthy Equation: High population density but low productivity of land

Boston Analytics Research
1. Food and Agriculture Organization of the United Nations (http://www.fao.org/)
2. CIA World Factbook, 2003
Seventy Percent of India has to improve its productivity

India cannot afford low productivity in the Agro sector

Note: * Real GDP with base year 2000
Boston Analytics Research
1. Energy Information Administration (http://www.eia.doe.gov)
2. Food and Agriculture Organization of the United Nations (http://www.fao.org/)
Challenge 7: Investments from overseas is relatively more Speculative

Total Foreign Investment ($ B)

<table>
<thead>
<tr>
<th>Country</th>
<th>Cumulative Total Foreign Investment ($ B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>$597 B</td>
</tr>
<tr>
<td>India</td>
<td>$96 B</td>
</tr>
</tbody>
</table>

% of FDI and Portfolio Investment (PI) in TFI ($ B)

<table>
<thead>
<tr>
<th>Country</th>
<th>PI (%)</th>
<th>FDI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>96.7%</td>
<td>3.3%</td>
</tr>
<tr>
<td>India</td>
<td>48.1%</td>
<td>51.9%</td>
</tr>
</tbody>
</table>

Boston Analytics Research
1. Reserve Bank of India.
**Challenge 8:** India ranks poorly along all of the essential vectors that drive HDI.
**Challenge 9: Employment creation**

**Demographics:**
- Labor Force – 467 Million
- 9.35% of Population - Age 20-24
- 8.52% of Population - Age 25-29

**Unemployment:**
- High

**Labor Participation Rate:**
- 2007 – 58.6%
- Decreasing 0.12% per year

**Education:**
- Literacy Rate – 60%
- Secondary Enroll. – 54.6% (107th)
- Tertiary Enroll. – 11.8% (100th)

*India will have large population of young workers.*
India’s trade deficit per capita has to be corrected

Average Growth Rate (1998-2008) vs. Trade Balance($) per Capita (2008)¹,²,³

<table>
<thead>
<tr>
<th>Average Growth (CAGR%: 1998-2008)</th>
<th>Trade Balance per Capita (US$/Capita)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>-7000 to -6000</td>
</tr>
<tr>
<td>9%</td>
<td>-6000 to -5000</td>
</tr>
<tr>
<td>8%</td>
<td>-5000 to -4000</td>
</tr>
<tr>
<td>7%</td>
<td>-4000 to -3000</td>
</tr>
<tr>
<td>6%</td>
<td>-3000 to -2000</td>
</tr>
<tr>
<td>5%</td>
<td>-2000 to -1000</td>
</tr>
<tr>
<td>4%</td>
<td>-1000 to 0</td>
</tr>
<tr>
<td>3%</td>
<td>0 to 1000</td>
</tr>
<tr>
<td>2%</td>
<td>1000 to 2000</td>
</tr>
<tr>
<td>1%</td>
<td>2000 to 3000</td>
</tr>
<tr>
<td>0%</td>
<td>3000 to 4000</td>
</tr>
<tr>
<td>1%</td>
<td>4000 to 5000</td>
</tr>
<tr>
<td>2%</td>
<td>5000 to 6000</td>
</tr>
<tr>
<td>3%</td>
<td>6000 to 7000</td>
</tr>
<tr>
<td>4%</td>
<td>7000 to 8000</td>
</tr>
<tr>
<td>5%</td>
<td>8000 to 9000</td>
</tr>
<tr>
<td>6%</td>
<td>9000 to 10000</td>
</tr>
<tr>
<td>7%</td>
<td>10000 to 11000</td>
</tr>
<tr>
<td>8%</td>
<td>11000 to 12000</td>
</tr>
<tr>
<td>9%</td>
<td>12000 to 13000</td>
</tr>
<tr>
<td>10%</td>
<td>13000 to 14000</td>
</tr>
</tbody>
</table>

1. Energy Information Administration - EIA (http://www.eia.doe.gov/)
2. UN Nations Population Division (http://www.un.org/english/)
3. World trade Organization (http://stat.wto.org/)

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Development of Country B Relative to Country A

Stage 1: Infrastructure Development
- Capital Goods
- Balance

Stage 2: Industrialization
- A
- B
- Products and Services
- Balance
- $ Balance

Stage 3: Globalization
- A
- B
- Balance

Stage 4: “Integration”
- One Economy
- A
- B

Balance of Trust
Beyond the Two Fundamental Philosophies

Economic Philosophy

Free Market

Market is the driver

Where is the Power?

Centrally Controlled

State is the Driver

Strategically Guided
India has to make a strategic shift

Economic Philosophy

Free Market
- Market is the driver
- USA
- UK

Mixed Economy
- Western Europe
- India

Socialism
- State is the Driver
- USSR
- EE
- China
- North Korea

Centrally Controlled

Where is the Power?

Strategically Guided
- Japan
- South Korea
- ASEAN Economies
The timing is right for a fresh look at developing an Enterprising India

1947  2007  2050

Socio Economic Experiments

Democracy, Secularism
Sense of Confidence
Strengthened “balance sheet”? Self realization?/Confidence
Modernizing Industry

Freedom from Old Constructs & Thinking Habits

Becoming Enterprising?

1. Global Credibility
2. Cautious Optimism
3. Widened Gaps & Enhanced Risks

Improve social equity
Strengthen “income statement”
Nurture a sustainable economic Model
A Strategic framework that group industries into different roles requiring different policy and infrastructure supports

Socio-Economic Impact

- Employment & capital generation ability
- Impact on Social development
- Impact on Industrial/Eco Environment
- Impact on the State’s Global Power

Competitive Advantage

- Global Links
- Stage of development and uniqueness
- Domestic Environment
- Competitiveness of input factors

Partha S Ghosh & Associates Model
Japan growth curve and position of other countries

Annual GDP per capita


0 10000 20000 30000 40000 50000 60000 70000 80000 90000 100000

Brazil
China
France
Germany
India
Italy
Russia
UK
US
Korea
Indonesia
Malaysia
Singapore
Norway
Switzerland
Sweden

Super Advanced Area

Advanced Area

Rui's Analysis

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The Two Strategic Vectors: Scope of the Future Industry?

**Balance?**

Conservation driven

Consumption driven

Positioning Science & Engineering with a strategic perspective?

Point Solution

Thesis of Economic Advance

Holistic/Integrative Solution

Perspective?
Critical Challenge: Mega differentials > Down-scaling technologies

Income Curve

Relative earning $/capita/Year

$100,000

750 million with excess of $25k/capita

1250 million with excess of $10k/capita

Mega differentials

1. Cultural distance
2. Emotional distance
3. Income distance

Bottom of the base

$500

Threshold zone

Σ Population (billion)

* Relative to the lowest cost producer

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Base of the Pyramid as platform of Incubator of new value propositions

Current Obstacles of Typical Socio-economic Pyramid

- Inertia of past consumption habits
- Widening Gap?
- “End of life” high cost Applications

Experiments at the top of the Inverted Pyramid

- Incubators & Innovation Labs at the bottom of the pyramid
- Trickle down of upgraded Solutions
- Proven Applications to break old habits
An approach to Multinationals

- Kanban/High Yield culture
- Champion within the Local
- Problem solving Process
- Supporter(s) (as buyers)
- Output
- X
- Output
- Unserved(s)
- Create Surplus

J-Soft Technologies

Top of the Base

Boston International
Balancing application of “Option surplus” and direction of “Natural momentum”

Relative earning $/capita/Year

1. Cultural distance
2. Emotional distance
3. Income distance

Bottom of the base
$500

$100,000

Option Surplus

Threshold zone

Natural Momentum

Σ Population (billion)

* Relative to the lowest cost producer
Expanded Field = Multiple High Value Added Opportunities

Industry’s Future (?): Two Strategic Vectors

Balance? Create New Game Energy/Materials

Conservation

Next generation Knowledge Intensive Solutions: “Small is beautiful”

Energy Efficient consumption

Perspective?

Holistic/Integrative Solution

Balance of Ecology

Point Solution

Thesis of Economic Advance

Conservation

Systems Approach to Energy & Transportation Management

Full recovery of Waste

Agro based Chemical Industry

New Chemistry for the Car

Carbon Free Energy System

Recycling

Lighter Products

Today Improved functionalities

Process Intensification

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Next generation Knowledge Intensive Solutions: “Small is beautiful”

Energy Efficient consumption

Perspective?

Holistic/Integrative Solution
The Road Ahead?

Incubation of 21st century economic & business models

Application of ready made solutions

Economic stature

National Resources