Indian Competitiveness:
Where Does the Nation Stand?

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Perspectives on Firm Success

- Competitive advantage resides inside a company or in its industry.
- Competitive advantage (or disadvantage) resides partly in the locations at which a company’s business units are based.
- Cluster participation is an important contributor to competitiveness.
- Competitive success depends primarily on company choices.
Indian Economic Performance 2004

- Economic reforms in the post-1991 period have delivered economic growth rates of about 5% annually.
- India’s ranking in the Global Competitiveness Report has improved significantly in the last few years.
- The Indian IT cluster has emerged as a leading competitor in the world market, transforming the perception of India as a competitor.

However, there are signs that the 1991 reforms are reaching the limits of their effectiveness:
  - The growth trend has fallen.
  - Total factor productivity growth has slowed.
  - The public sector’s fiscal position has again weakened.
  - International market success is still dominated by a few sectors.
  - The disproportionate success of the IT cluster is as much an indication of weaknesses in India's business environment as a metaphor for India overall.
Comparative Economic Performance
Real GDP per Capita

Compound annual growth rate of real GDP per capita, 1991-2002

GDP per capita (PPP adjusted) in US-$, 2002

Source: EIU (2003)
India’s Export Performance
World Export Market Shares

Source: WTO (2002)
India’s Service Exports
Effect of IT Services Exports

Service Exports in Million US-

IT Service Exports
Other Service Exports


Source: IMF (2002)
India’s Goods Export Performance By Broad Sector
1997-2000

India’s average change in world goods export share:
+ 0.06%

Note: 90% of exports in the category “Personal” are accounted for by Jewelry and Diamonds
Source: UNCTAD Trade Data. Author’s analysis.

India’s average goods export share: 0.76%

= $10 billion export volume in 2000

Change in India’s World Export Share, 1997 – 2000

World Export Share, 2000

+1.5%

+1.0%

+0.5%

0.0%

-0.5%

0%

1%

2%

3%

4%

5%

6%
**International Patenting Output**

**Annual U.S. patents per 1 million population, 2002**

- USA
- Japan
- Taiwan
- Sweden
- Germany
- Finland
- Israel
- Canada
- Netherlands
- France
- Denmark
- Australia
- New Zealand
- Norway
- Singapore
- South Korea
- UK
- France
- China
- India

**Compound annual growth rate of US-registered patents, 1990 - 2002**

What is Competitiveness?

• Competitiveness is determined by the **productivity** with which a nation uses its human, capital, and natural resources. Productivity sets a nation’s or region’s standard of living (wages, returns to capital, returns to natural resource endowments)
  – Productivity depends both on the **value** of products and services (e.g. uniqueness, quality) as well as the **efficiency** with which they are produced.
  – It is not **what** industries a nation competes in that matters for prosperity, but **how** firms compete in those industries
  – Productivity in a nation is a reflection of what both domestic and foreign firms **choose to do in that location**. The location of ownership is secondary for national prosperity.
  – The productivity of “**local**” industries is of fundamental importance to competitiveness, not just that of traded industries
  – Devaluation **does not** make a country more competitive

• Nations compete in offering the **most productive environment** for business
• The public and private sectors play **different but interrelated roles** in creating a productive economy
• Innovation is more than just scientific discovery
• There are no low-tech industries, only low-tech firms
• To become an advanced economy, a nation’s firms must move from assimilating technology to creating new technology
Determinants of Productivity and Productivity Growth

Macroeconomic, Political, Legal, and Social Context for Development

Microeconomic Foundations of Development

• A sound macroeconomic, political, legal, and social context creates the potential for competitiveness, but is not sufficient
• Competitiveness ultimately depends on improving the microeconomic capability of the economy and the sophistication of local companies and local competition
Comparative Labor Productivity Performance

Compound annual growth rate of real GDP per employee, 1996-2002*

*Hong Kong CAGR based on 1997-2002
Source: EIU (2003)
Indian Productivity Growth Over Time

Total Productivity Growth

Average Annual Growth Rate (Estimation Interval)

Note: Estimation interval reflects different assumptions about labor share in production
Comparative Inward Foreign Investment
Selected Economies

FDI Stocks as % of GDP, Average 1998-2001

FDI Inflows as % of Gross Fixed Capital Formation, Average 1998-2001

Note: Some researchers argue that Japanese statistics understate FDI inflows and stocks by a factor of three (Weinstein, 1997)
Productivity and the Business Environment

Context for Firm Strategy and Rivalry

Factor (Input) Conditions
- Presence of high quality, specialized inputs available to firms
  - Human resources
  - Capital resources
  - Physical infrastructure
  - Administrative infrastructure
  - Information infrastructure
  - Scientific and technological infrastructure
  - Natural resources

Demand Conditions
- Sophisticated and demanding local customer(s)
- Local customer needs that anticipate those elsewhere
- Unusual local demand in specialized segments that can be served regionally and globally

Related and Supporting Industries
- Access to capable, locally based suppliers and firms in related fields
- Presence of clusters instead of isolated industries

- A local context and rules that encourage investment and sustained upgrading
  - e.g., Intellectual property protection
- Meritocratic incentive systems across institutions
- Open and vigorous competition among locally based rivals

Successful economic development is a process of successive economic upgrading, in which the business environment in a nation evolves to support and encourage increasingly sophisticated ways of competing.
The California Wine Cluster

- Grapestock
- Fertilizer, Pesticides, Herbicides
- Grape Harvesting Equipment
- Irrigation Technology
- Growers/Vineyards
- Winemaking Equipment
- Barrels
- Bottles
- Caps and Corks
- Labels
- Public Relations and Advertising
- Specialized Publications (e.g., Wine Spectator, Trade Journal)
- Educational, Research, & Trade Organizations (e.g. Wine Institute, UC Davis, Culinary Institutes)
- Wineries/Processing Facilities
- California Agricultural Cluster
- Tourism Cluster
- Food Cluster

Sources: California Wine Institute, Internet search, California State Legislature. Based on research by MBA 1997 students R. Alexander, R. Arney, N. Black, E. Frost, and A. Shivananda.
Leading Footwear Clusters

**Portugal**
- Production
- Focus on short-production runs in the medium price range

**Italy**
- Design, marketing, and production of premium shoes
- Export widely to the world market

**United States**
- Design and marketing
- Focus on specific market segments like sport and recreational shoes and boots
- Manufacturing only in selected lines such as hand-sewn casual shoes and boots

**Romania**
- Production subsidiaries of Italian companies
- Focus on lower to medium price range

**Vietnam/Indonesia**
- OEM Production
- Focus on the low cost segment mainly for the European market

**China**
- OEM Production
- Focus on low cost segment mainly for the US market

Source: Research by HBS student teams in 2002
Institutions for Collaboration
Selected Massachusetts Organizations, Life Sciences

Life Sciences Industry Associations
- Massachusetts Biotechnology Council
- Massachusetts Medical Device Industry Council
- Massachusetts Hospital Association

General Industry Associations
- Associated Industries of Massachusetts
- Greater Boston Chamber of Commerce
- High Tech Council of Massachusetts

Economic Development Initiatives
- Massachusetts Technology Collaborative
- Mass Biomedical Initiatives
- Mass Development
- Massachusetts Alliance for Economic Development

University Initiatives
- Harvard Biomedical Community
- MIT Enterprise Forum
- Biotech Club at Harvard Medical School
- Technology Transfer offices

Informal networks
- Company alumni groups
- Venture capital community
- University alumni groups

Joint Research Initiatives
- New England Healthcare Institute
- Whitehead Institute For Biomedical Research
- Center for Integration of Medicine and Innovative Technology (CIMIT)
Influences on Competitiveness
Multiple Geographic Levels

- World Economy
- Broad Economic Areas
- Groups of Neighboring Nations
- Nations
- States, Provinces
- Metropolitan Areas, Rural Areas
Shifting Responsibilities for Economic Development

Old Model

- **Government** drives economic development through policy decisions and incentives

New Model

- Economic development is a **collaborative process** involving government at multiple levels, companies, teaching and research institutions, and institutions for collaboration
Competitiveness Agenda for India

- Macroeconomic and Social Context
  - The need for public sector reform
  - Integration of social and economic policy
  - Enhancing agricultural competitiveness

- Microeconomic Business Environment
  - Barriers to competition
  - Weaknesses in physical infrastructure
  - Financial markets
  - Limited cluster development
  - Enhancing India’s innovative capacity

- Economic Policy-Making Process
  - Shifting roles in economic development
  - Economic strategies at the state level
  - Roles in economic development
Public Sector Reform

• The Indian public sector accounts for an important part of the country’s modern economy
  – 12m employees of 27m total in the modern economy are public sector employees
  – Public sector activities have often been used as an instrument of social policy

• Deteriorating public sector balances threaten macroeconomic stability
  – Current attempts to control public deficits by curbing public investment will have detrimental effects on growth

• More efficient public sector services are essential to increase Indian prosperity and allow rising competitiveness of Indian companies

• Spending public resources more effectively is the first priority, rather than focusing primarily on new revenues
Integrating Economic and Social Policy

- In the new thinking on competition, there is **not an inherent conflict** between economic and social objectives, but a long term synergy

- The **competitiveness of companies** depends heavily on
  - Rising skill levels
  - Safe working conditions
  - A sense of equal opportunity
  - Low levels of pollution (pollution is a sign of unproductive use of physical resources)

- However, efforts to meet “social” objectives must be **aligned with productivity** and prepare and motivate individuals to **succeed in the market system**

- India has fallen into the trap of distorting markets to meet social objectives, which harms competitiveness
  - E.g., price subsidies; quotas; reserved industries

- Instead, India must address root causes
Agricultural Reform

• Improving the productivity of agriculture is necessary to make significant headway in improving Indian prosperity
  – Two thirds of Indians are engaged in (mostly subsistence) agriculture

• Making agriculture more efficient will raise purchasing power and, over time, allow large scale movement of workers into other parts of the economy
  – Higher prosperity on average will move larger numbers of Indians into the market for Indian products and services
  – Sustainable economic success is for companies hard to achieve, if their location is not succeeding as well
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Barriers to Competition

• Barriers to foreign competition
  – India’s tariff levels have come down substantially to a 35% average, but are still significantly higher than in peer countries
  – Non-tariff barriers have become more important; India is now the second most proliferate user of anti-dumping measures
  – Barriers to foreign direct investment (FDI) remain substantial and have significantly limited inflows of capital and know how

• Barriers to domestic competition
  – The level of bureaucratic red tape, corruption, and regulatory distortions remains high despite recent improvements
  – Government ownership of companies remains widespread, and privatization is moving at glacial speed
  – Corporate boards provide only limited governance

• Reforms in India need to become far deeper and more widespread to keep pace with reforms in other countries
Costs of Business Formation
Asian Countries

Corruption
Transparency International Global Corruption Report

Note: Asian countries in blue, constant country sample
Source: Global Corruption Report, 2003
Transportation Cost Position
Selected Asian Competitors

Size of India’s Transportation Cost Disadvantage for Textiles shipped to the US

Other Physical Infrastructure

- India’s weaknesses in physical infrastructure are as much the result of **distortive regulations** as of low investment
  - **Power supply** is scarce and unreliable, with rate regulation reducing the incentives to invest in better plants
  - **Railroad infrastructure** is deteriorating, and price distortions to subsidize personal travel work against the efficiency of the railroad network for goods transportation

- Improvements in the regulatory environment would have a significant impact on **removing bottlenecks** in the physical infrastructure
Financial Markets

• India’s financial markets have **improved** over the last five years
• However, barriers to efficient, market-driven capital allocation remain
  – The majority of financial institutions remains under **government control**, with weak incentives for efficient credit decisions
  – Targets for credit allocation **distort** the flow of capital
  – There is no efficient mechanisms for **bankruptcy** and recovering **non-performing loans**
  – The **spread** between interest rates for loans and deposits remains high
• The rising **government deficits** crowd out private investments

• Levels of private investment in India remain **below** the levels in peer countries
• Private companies are reported to be **credit-constrained**
• **Conglomerate business groups** remain a necessary institutional response to financial market weaknesses
Indian Movie Cluster ("Bollywood")

TEXTILE CLUSTER
- Costuming
- Producers
- Casting
- SET Construction

FINANCIAL SERVICES CLUSTER
- Animation
- Special Effects
- Electronics Equipment
- Film Equipment
- Lighting
- Sound Labs
- Film Processing
- Film Editing

FILM
- Music
- Television
- Publishing

TOURISM CLUSTER
- Writers
- Directors
- Actors
- Singers
- Agents
- Makeup Artists
- Hairdressing
- Food Service
- Location Scouts
- Sound Stages
- Set Design
- Props
- Transportation

TRANSPORT CLUSTER
- Cinema Management
- Retail Outlets
- Satellite Broadcasting
- Cable Operations

Source: Research by Harvard student team (Vivake Bhalla, Prasad Bhamre, Vanessa Liu, Kellie McKnechie, Rahul Mehendale)

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The Australian Wine Cluster

History

1930
First oenology course at Roseworthy Agricultural College

1955
Australian Wine Research Institute founded

1965
Australian Wine Bureau established

1970
Winemaking school at Charles Sturt University founded

1980
Australian Wine and Brandy Corporation established

1990
Winemakers Federation of Australia established

1991 to 1998
New organizations created for education, research, market information, and export promotions

1950s
Import of European winery technology

1960s
Recruiting of experienced foreign investors, e.g. Wolf Bass

1970s
Continued inflow of foreign capital and management

1980s
Creation of large number of new wineries

1990s
Surge in exports and international acquisitions

Cluster Policy versus Industrial Policy

**Industrial Policy**
- Target desirable industries / sectors
- Focus on domestic companies
- Intervene in competition (e.g., protection, industry promotion, subsidies)
- Centralizes decisions at the national level

**Cluster-based Policy**
- **All** clusters can contribute to prosperity
- Domestic and foreign companies both enhance productivity
- Relax impediments and constraints to productivity
- Emphasize cross-industry linkages / complementarities
- Encourage initiative at the state and local level

Distort competition

Enhance competition
## Innovation in India
### U.S. Patenting by Indian Organizations

<table>
<thead>
<tr>
<th>Organization</th>
<th>Patents Issued from 1997 to 2001</th>
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</thead>
<tbody>
<tr>
<td>1 COUNCIL OF SCIENTIFIC AND IND. RESEARCH</td>
<td>172</td>
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<tr>
<td>2 TEXAS INSTRUMENTS, INCORPORATED</td>
<td>28</td>
</tr>
<tr>
<td>3 RANBAXY LABORATORIES LIMITED</td>
<td>23</td>
</tr>
<tr>
<td>4 DR. REDDY'S RESEARCH FOUNDATION</td>
<td>20</td>
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<tr>
<td>5 GENERAL ELECTRIC COMPANY</td>
<td>17</td>
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<tr>
<td>6 INDIAN OIL CORPORATION, LTD.</td>
<td>12</td>
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<tr>
<td>7 PANACEA BIOTEC LIMITED</td>
<td>11</td>
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<tr>
<td>8 LUPIN LABORATORIES LIMITED</td>
<td>9</td>
</tr>
<tr>
<td>8 DABUR RESEARCH FOUNDATION</td>
<td>9</td>
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<tr>
<td>8 NATIONAL INSTITUTE OF IMMUNOLOGY</td>
<td>9</td>
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<tr>
<td>11 INTERNATIONAL BUSINESS MACHINES CORP.</td>
<td>8</td>
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<tr>
<td>12 INDIAN PETROCHEMICALS CORPORATION LIMITED</td>
<td>7</td>
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<tr>
<td>13 HOECHST AKTIENGESELLSCHAFT</td>
<td>6</td>
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<tr>
<td>13 GEM ENERGY INDUSTRY LIMITED</td>
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<tr>
<td>15 NATREON INC.</td>
<td>5</td>
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<tr>
<td>15 IOWA INDIA INVESTMENTS COMPANY LIMITED</td>
<td>5</td>
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<tr>
<td>17 UNILEVER HOME &amp; PERSONAL CARE USA</td>
<td>4</td>
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<tr>
<td>17 TORRENT PHARMACEUTICALS LTD.</td>
<td>4</td>
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<tr>
<td>17 NATIONAL RESEARCH DEVELOPMENT CORP.</td>
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</tr>
<tr>
<td>17 DEP. OF SCIENCE AND TECHNOLOGY, GOV. OF INDIA</td>
<td>4</td>
</tr>
</tbody>
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Note: Shading indicates universities, research institutions, and other government agencies.

### Patents by Organization

**Commonwealth of Massachusetts**

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</tr>
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<tr>
<td>1 MASSACHUSETTS INSTITUTE OF TECHNOLOGY</td>
<td>518</td>
</tr>
<tr>
<td>2 GENERAL HOSPITAL CORPORATION</td>
<td>296</td>
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<td>3 EMC CORPORATION</td>
<td>269</td>
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<tr>
<td>4 DIGITAL EQUIPMENT CORPORATION</td>
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<td>5 POLAROID CORPORATION</td>
<td>213</td>
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<tr>
<td>6 ANALOG DEVICES, INC.</td>
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<tr>
<td>7 MILLENNIUM PHARMACEUTICALS, INC.</td>
<td>165</td>
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<td>8 HARVARD UNIVERSITY</td>
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<tr>
<td>9 COMPAQ COMPUTER CORPORATION, INC.</td>
<td>147</td>
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<tr>
<td>10 SUN MICROSYSTEMS, INC.</td>
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<tr>
<td>11 BOSTON SCIENTIFIC CORPORATION</td>
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<td>12 ACUSHNET COMPANY</td>
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<tr>
<td>13 GENETICS INSTITUTE, INC.</td>
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<tr>
<td>14 GILLETTE COMPANY</td>
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<td>15 BRIGHAM AND WOMEN'S HOSPITAL</td>
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<td>16 RAYTHEON COMPANY</td>
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<tr>
<td>17 GENERAL ELECTRIC COMPANY</td>
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<td>18 HEWLETT-PACKARD COMPANY</td>
<td>96</td>
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<tr>
<td>19 CHILDREN'S MEDICAL CENTER CORPORATION</td>
<td>93</td>
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<tr>
<td>20 QUANTUM CORP. (CA)</td>
<td>93</td>
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<tr>
<td>21 COGNEX CORPORATION</td>
<td>90</td>
</tr>
<tr>
<td>22 DANA-FARBER CANCER INSTITUTE</td>
<td>90</td>
</tr>
<tr>
<td>23 JOHNSON &amp; JOHNSON PROFESSIONAL INC.</td>
<td>90</td>
</tr>
<tr>
<td>24 BOSTON UNIVERSITY</td>
<td>84</td>
</tr>
<tr>
<td>25 SEPRACOR INC.</td>
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- Microeconomic Business Environment
  - Barriers to competition
  - Weaknesses in physical infrastructure
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- Economic Policy-Making Process
  - Shifting roles in economic development
  - Economic strategies at the state level
  - Roles in economic development
Specialization of Regional Economies

Select U.S. Geographic Areas

Seattle-Bellevue-Everett, WA
Aerospace Vehicles and Defense
Fishing and Fishing Products
Analytical Instruments

San Francisco-Oakland-San Jose Bay Area
Communications Equipment
Agricultural Products
Information Technology

Los Angeles Area
Apparel
Building Fixtures, Equipment and Services
Entertainment

San Diego
Leather and Sporting Goods
Power Generation
Education and Knowledge Creation

Wichita, KS
Aerospace Vehicles and Defense
Heavy Machinery
Oil and Gas

Pittsburgh, PA
Construction Materials
Metal Manufacturing
Education and Knowledge Creation

Chicago
Communications Equipment
Processed Food
Heavy Machinery

Los Angeles Area
Apparel
Building Fixtures, Equipment and Services
Entertainment

San Francisco-Oakland-San Jose Bay Area
Communications Equipment
Agricultural Products
Information Technology

Los Angeles Area
Apparel
Building Fixtures, Equipment and Services
Entertainment

San Diego
Leather and Sporting Goods
Power Generation
Education and Knowledge Creation

Wichita, KS
Aerospace Vehicles and Defense
Heavy Machinery
Oil and Gas

Pittsburgh, PA
Construction Materials
Metal Manufacturing
Education and Knowledge Creation

Chicago
Communications Equipment
Processed Food
Heavy Machinery

Boston
Analytical Instruments
Education and Knowledge Creation
Communications Equipment

Raleigh-Durham, NC
Communications Equipment
Information Technology
Education and Knowledge Creation

Atlanta, GA
Construction Materials
Transportation and Logistics
Business Services

Note: Clusters listed are the three highest ranking clusters in terms of share of national employment
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

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Regional Business Environment and Prosperity

India

Per Capita SDP, 1998/99


R² = 0.6582
Regional Economic Strategies in India

• India has *devolved* important economic policy responsibilities to the state level

• However,
  – McKinsey reports that *40% of all regulations* and government interventions holding back productivity growth are controlled at the state level
  – The recent deterioration of *public sector fiscal balances* was largely driven by a few states
  – The last *change of the public financing system* has further deteriorated the incentives for states to run sustainable budgets

• India needs to create a policy environment where states have greater *capacity* and *incentives* to take charge of their own economic competitiveness
Shifting Responsibilities for Economic Development

**Old Model**

- **Government** drives economic development through policy decisions and incentives

**New Model**

- Economic development is a **collaborative process** involving government at multiple levels, companies, teaching and research institutions, and institutions for collaboration
Role of the Private Sector in Economic Development

• A company’s competitive advantage is partly the result of the **local environment**
• Company membership in a cluster offers **collective benefits**
• Private investment in “**public goods**” is justified

• Take an **active role** in upgrading the local infrastructure
• Nurture **local suppliers** and attract new supplier investments
• Work closely with local **educational and research institutions** to upgrade quality and create specialized programs addressing cluster needs
• Provide government with **information** and **substantive input** on regulatory issues and constraints bearing on cluster development
• Focus **corporate philanthropy** on enhancing the local business environment

• An important role for **trade associations**
  – Greater influence
  – Cost sharing
India’s Potential in 2004

• The current and announced reforms in India have the potential to move the country far beyond of what has been achieved in the last decade

• To achieve success, the reforms need to be widespread and sustained
  – Everything matters for Competitiveness
  – Competitiveness is a marathon, not a sprint

• Progress on competitiveness will also require a new model of joint private-public efforts rather than a government-driven model

• India has the best opportunity to improve its economic competitiveness in decades; the country can’t afford to squander this opportunity
Selected References on Competitiveness and Innovation

Professor Michael E. Porter


• “UK Competitiveness: Moving to the Next Stage”, with Christian Ketels, DTI Economics Papers, No.3, London: 2003


Selected References on Competitiveness and Innovation (continued)

Professor Michael E. Porter


• “Innovation Lecture,” published by the Dutch Ministry of Economics, 2001


