

Innovation Policy And Strategy

- Indian Perspective

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OUTLINE

- ~ Initiatives for Promotion of Innovation – An Overview**
- ~ Globalization of Innovation**
- ~ Challenges**
- ~ Strategies**

Initiatives for Promotion of Innovation – An Overview

- Examine the policies, institutions and instruments that have shaped the national innovation system (to understand the National specificities)
 - ~ Pre- Independence
 - ~ Post – Independence (after 1947)
- Broader definition of Innovation in developing context – to include knowledge its creation and commercialization for “new to world” and absorption and diffusion for “ new to market”

S&T POLICY - VISION

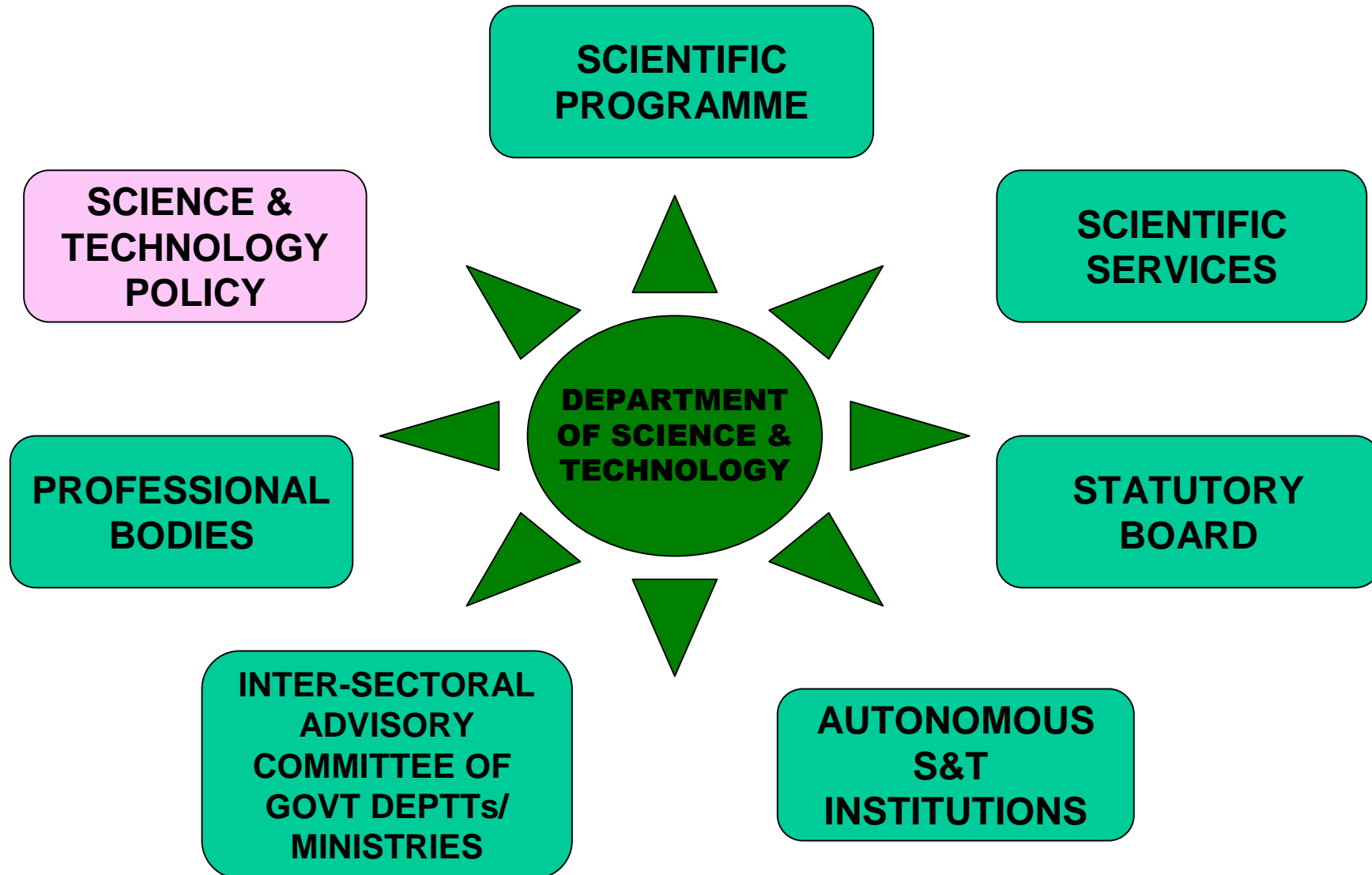


**FIRST PRIME MINISTER OF
INDIA**

JAWAHARLAL NEHRU

*‘ The Progress
of Science & its
offspring technology is
changing the way man thinks
of himself and the world.....
Science shall
put an end to
superstition, rituals
and dogma. ’*

DST- Policy making body for S&T



Determinants of NSI

- knowledge support, commercialization of research, collaborative research, financial support, regulation, IPR and ethical issues etc in the Indian context.
 - Pre – liberalization (prior 1991)
 - Post - liberalization (post 1991)

Innovation policy /Instruments

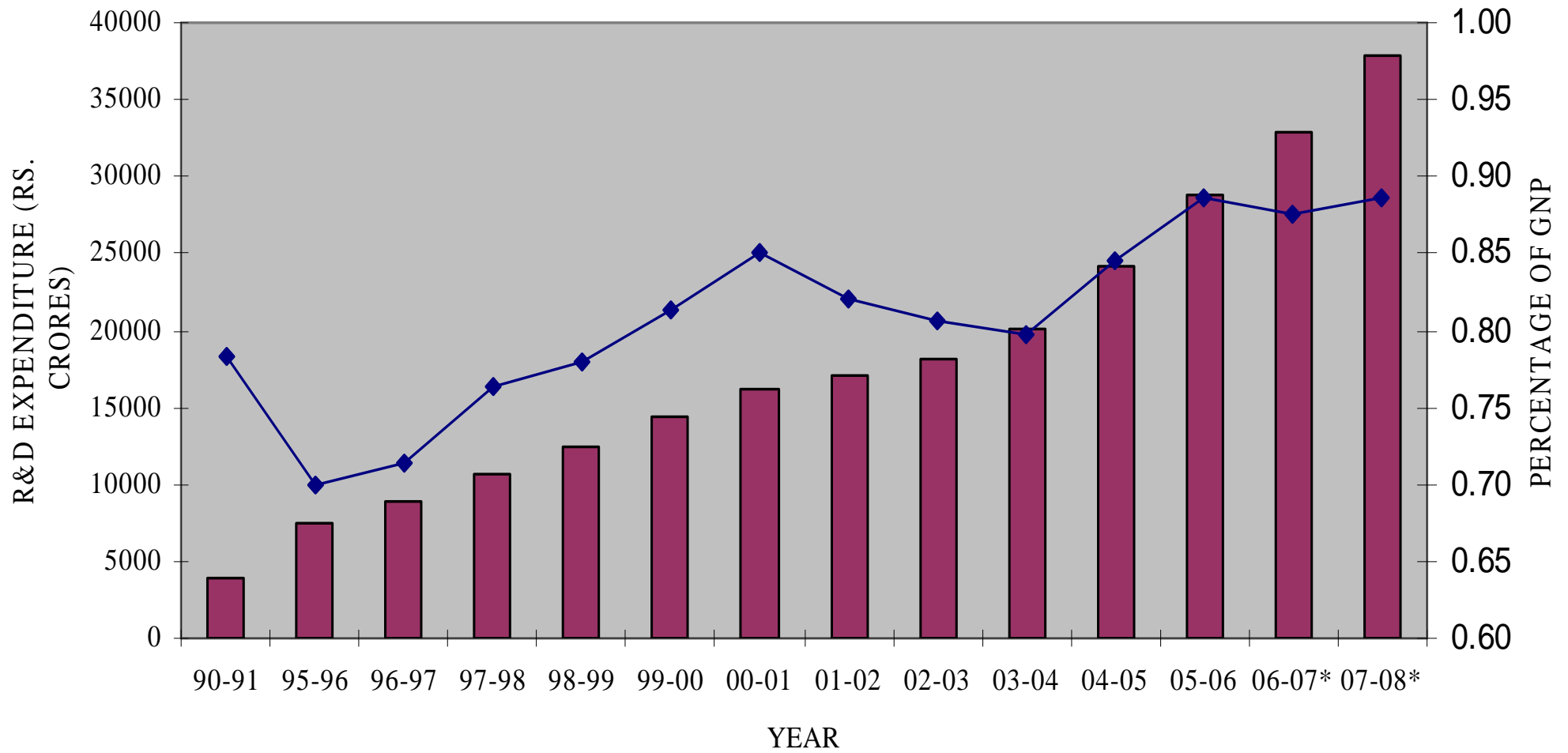
Period	Horizontal Policies/Instruments	Vertical Policies/Instruments	Regulatory Framework
1947- 1980 (Science Oriented Approach)	SPR(1958), TPS(1993), Drug and Cosmetics Act (1940), Industrial policy(1948 and 1956)		IPA (1970)
1980-1995 (Technology Centric Approach)	HGT, Industrial Policy(1991) Education Policy (1986)	NBDB(1983), DBT(1986)	
1995-2000 (Technology Centric Approach)	DPRP (1994), NIMTLI (2000)	NBRI	WTO(1995), Patents Amendment(1999)
2000 beyond (Systemic Approach to S&T Innovation)	STP(2003), Tepp, NIF GLP NMCC(2005)	Biotechnology Vision(2001), DNBS(2005), SIBRI(2006)	Patents Amendment (2002 and 2005) , Ethical Guidelines

S&T Innovation Initiatives – Focus

Pre- Reforms -1991	Post Reforms-1991
R&D incentives focus – generation of technologies in the public funded res. Labs for transfer in the industrial sector	Private sector participation in R&D enhanced
In-house R&D in industry was to encourage for absorption, adaptation and assimilation.	R&D driven business
Emphasis on self-reliance – indigenous tech. development	Collaborative research ; Networked model, PPP
Regulation and restrictions in trade and industrial development	Ease on restrictions and regulations
Horizontal S&T focus	Sectoral focus – DBT, Health research, MoES - pharma, Auto, IT , BT Globalization of innovation - MNCs centers, FDI , M&A , Outsourcing of R&D etc S&T Missions, Science for Societal solutions

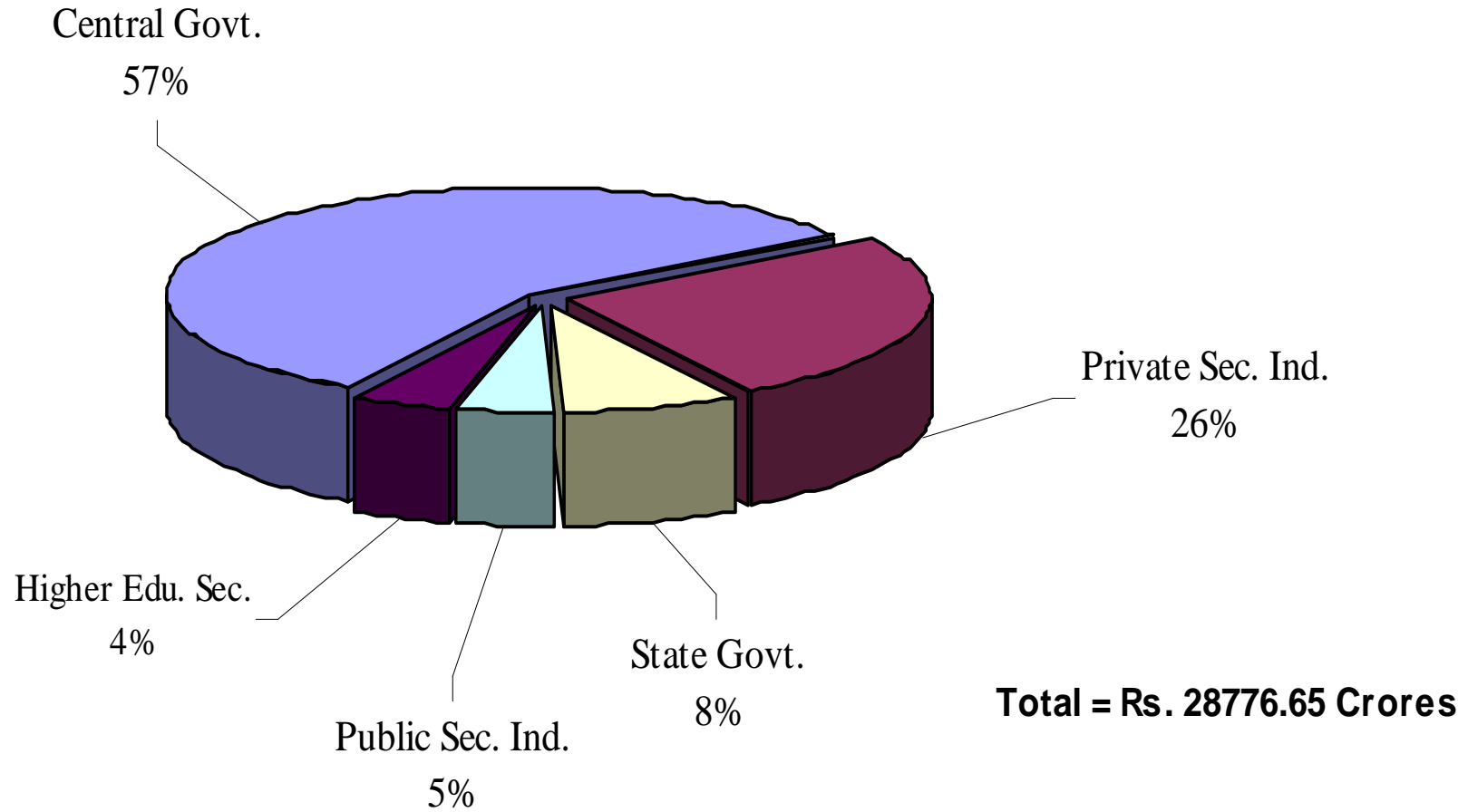
India's Innovative Performance

NATIONAL R&D EXPENDITURE AND ITS PERCENTAGE TO GNP



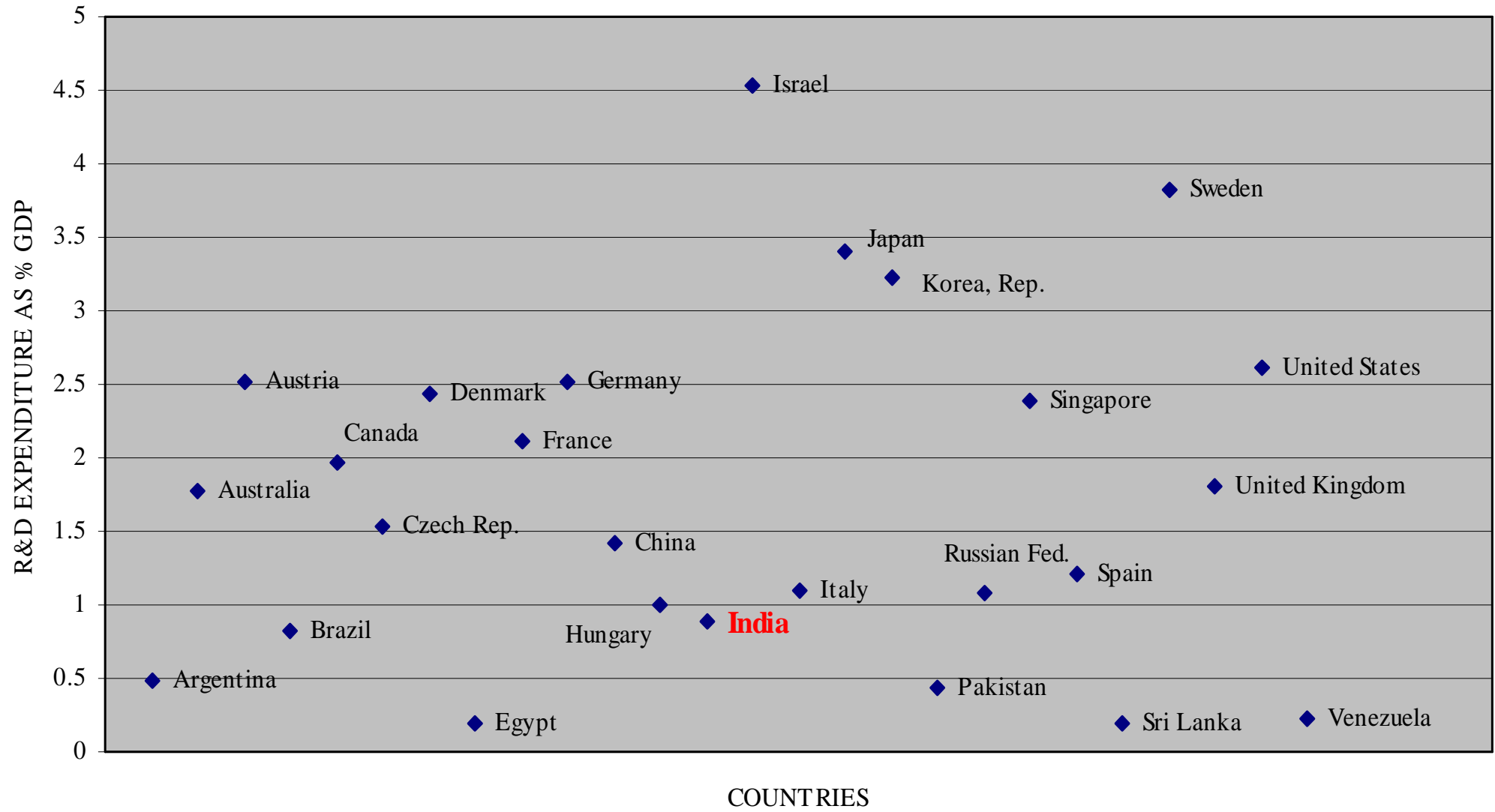
■ R&D Expenditure ◆ GNP (%)

NATIONAL R&D EXPENDITURE SECTOR- WISE, 2005-06



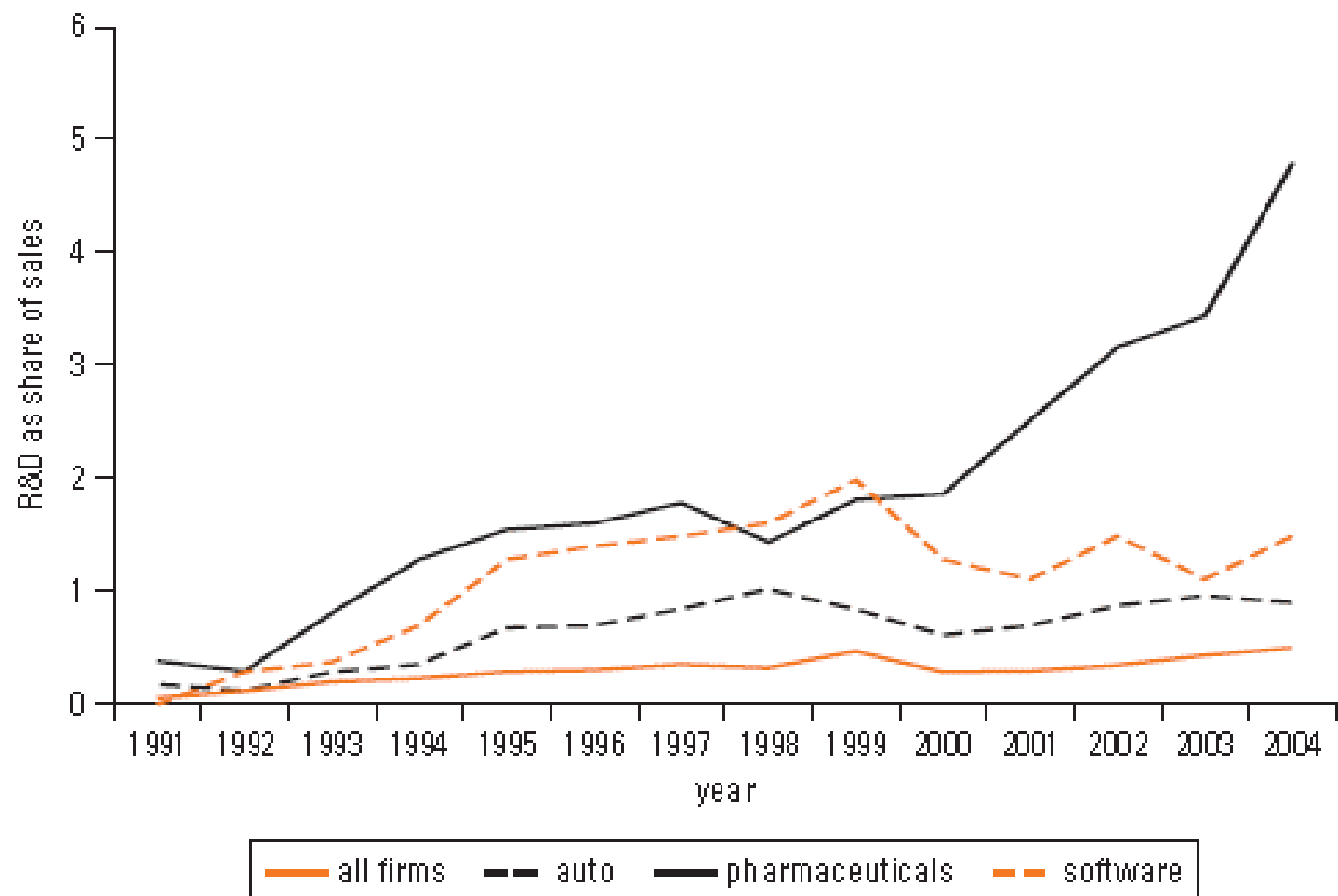
■ Central Govt. ■ Private Sec. Ind. ■ State Govt. ■ Public Sec. Ind. ■ Higher Edu. Sec.

R&D EXPENDITURE AS PERCENT OF GDP FOR SELECTED COUNTRIES, 2004-07



R&D Intensity of Indian Corporations in All Reporting Firms and Three Key Sectors, 1991–2004

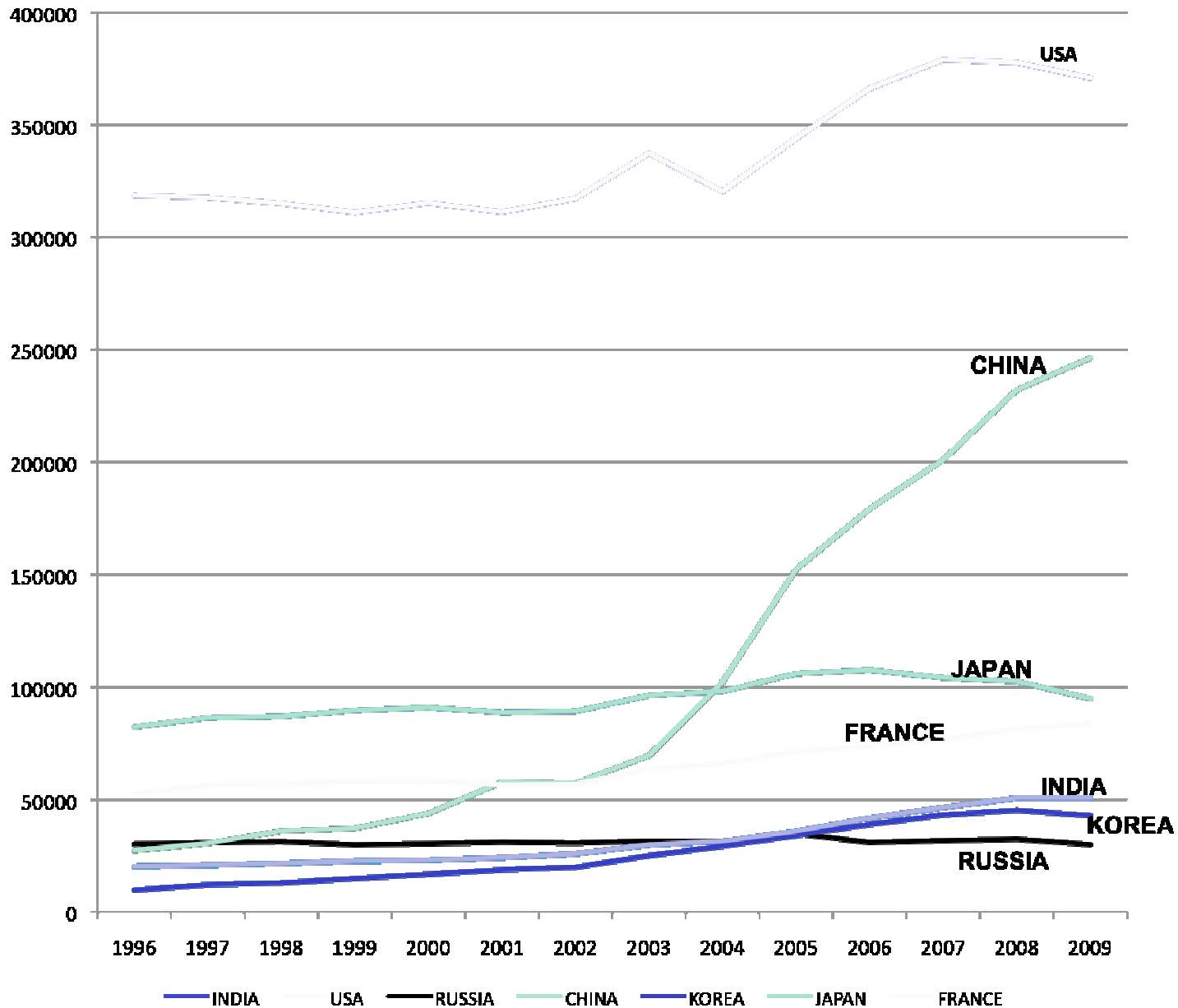
(R&D spending as a percentage of sales)



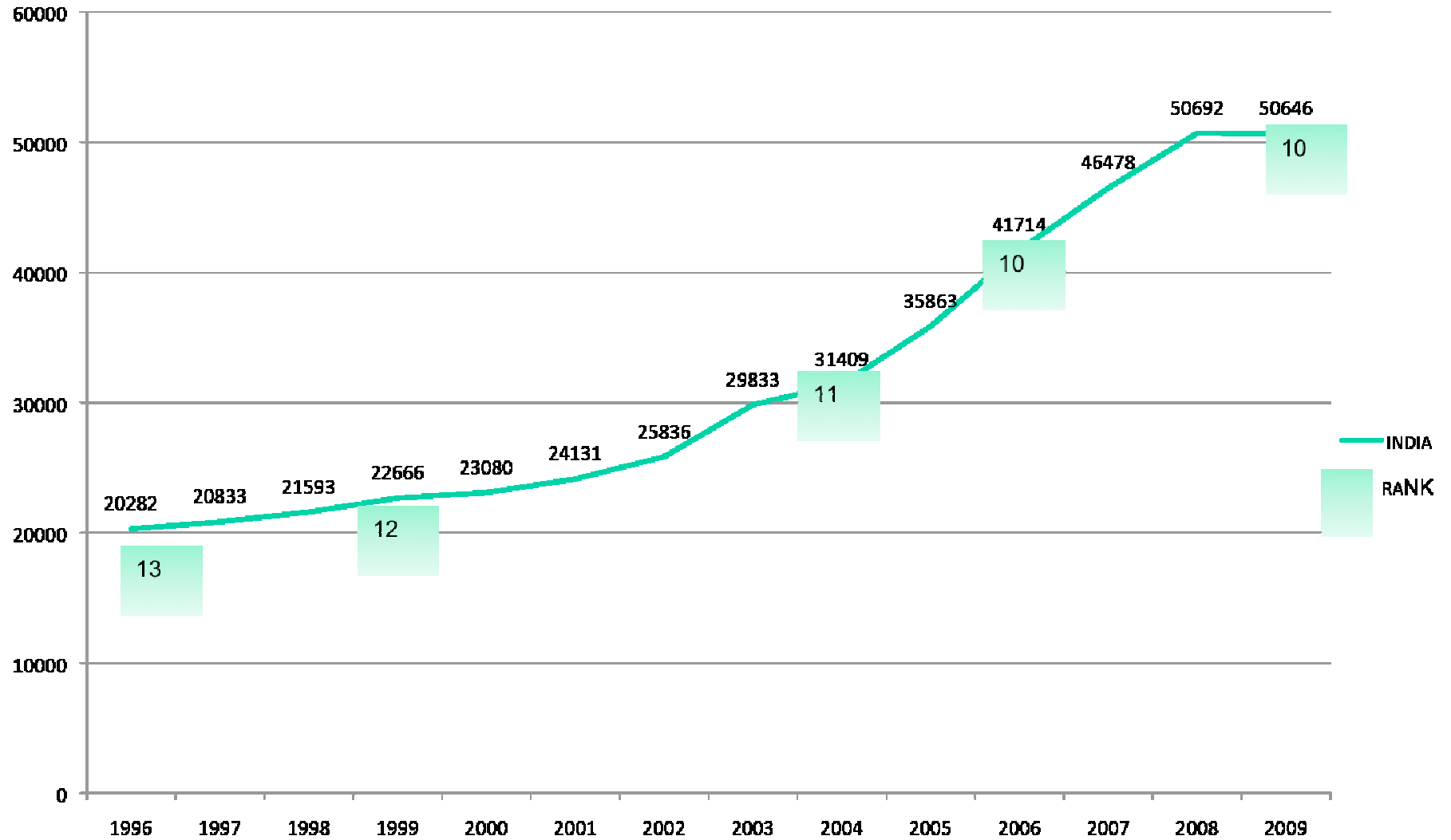
Source: Compiled from data in Bowonder and others (2006).

by Mark A Dutz, World Bank 2007

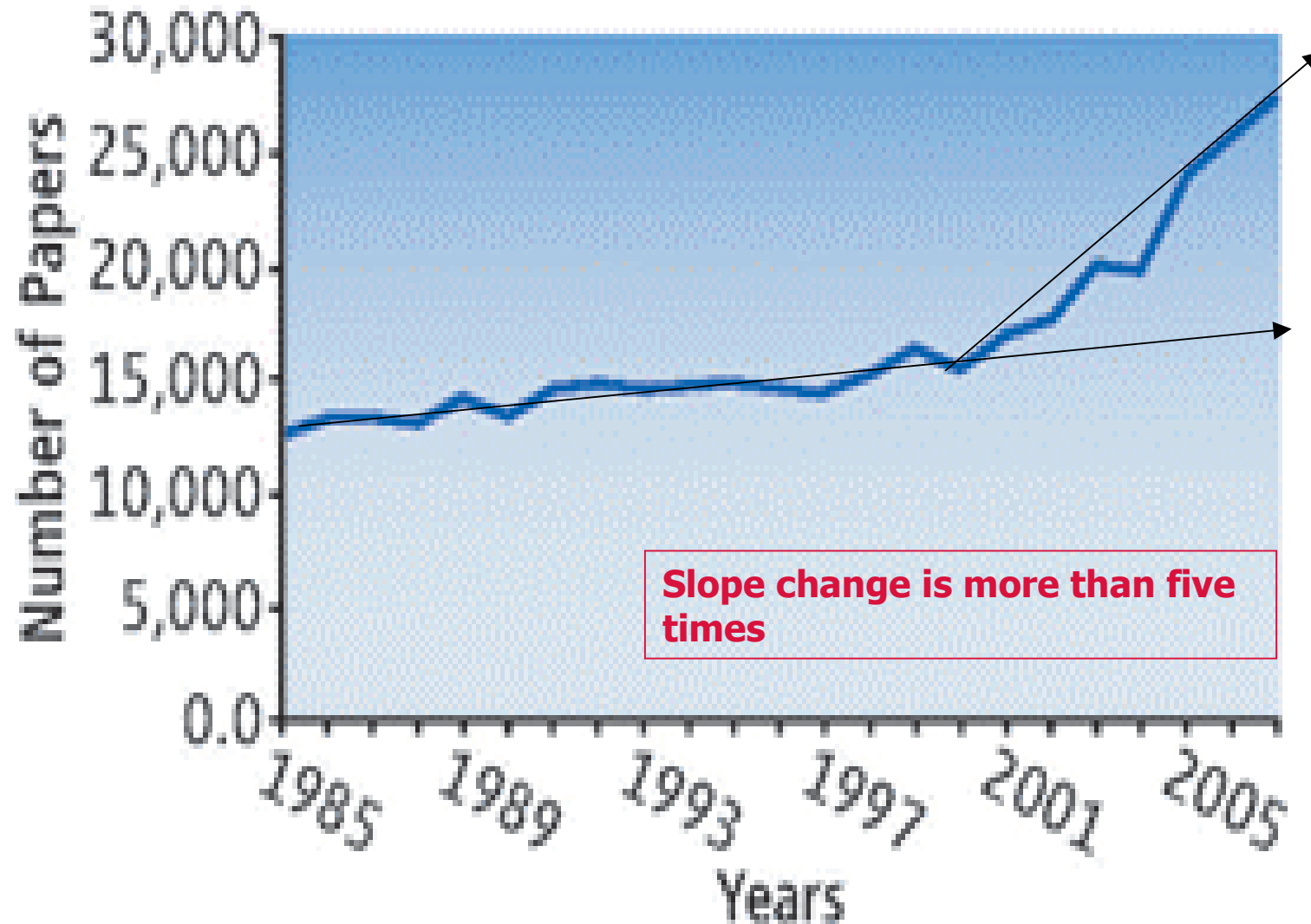
**Paper Publication of India with other Countries
1996 - 2009**



Annual Publication of INDIA ,1996 - 2009



ANNUAL INDIAN PAPER OUTPUT

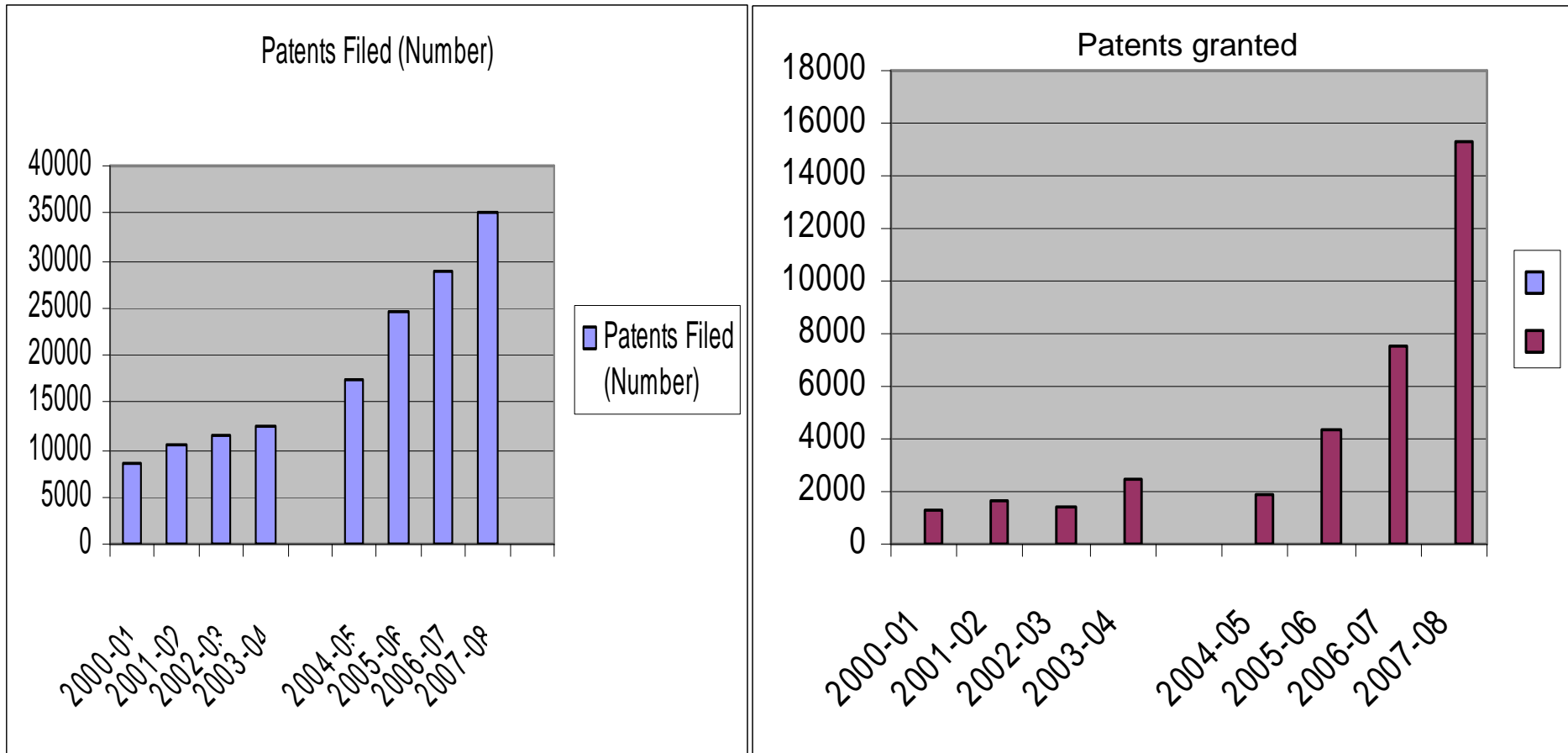


Good news is that citation frequency has doubled during the last few years

Thomson Reuters National Science Indicators

- Indian scientists have made major strides both in quality and productivity since 2000, according to the latest figures from the Science Watch tracking service (www.sciencewatch.com).
- The number of papers produced by Indian scientists was more or less stagnant from 1985 to 2000 but jumped from 17,000 in 2001 to 27,000 in 2007 (see chart).
- Citation rates are also rising across the board—more than doubling, for example, in biology and biochemistry. The biggest gains have come in the physical sciences, especially materials science. Nobuko Miyairi, a consultant at Thomson Reuters, which publishes ScienceWatch, calls it “noteworthy” that Indian science is “fairly well balanced between life sciences and physical sciences,” because most of the rest of Asia “tends to be more heavily focused on ... physical sciences.”

Patenting trends in India



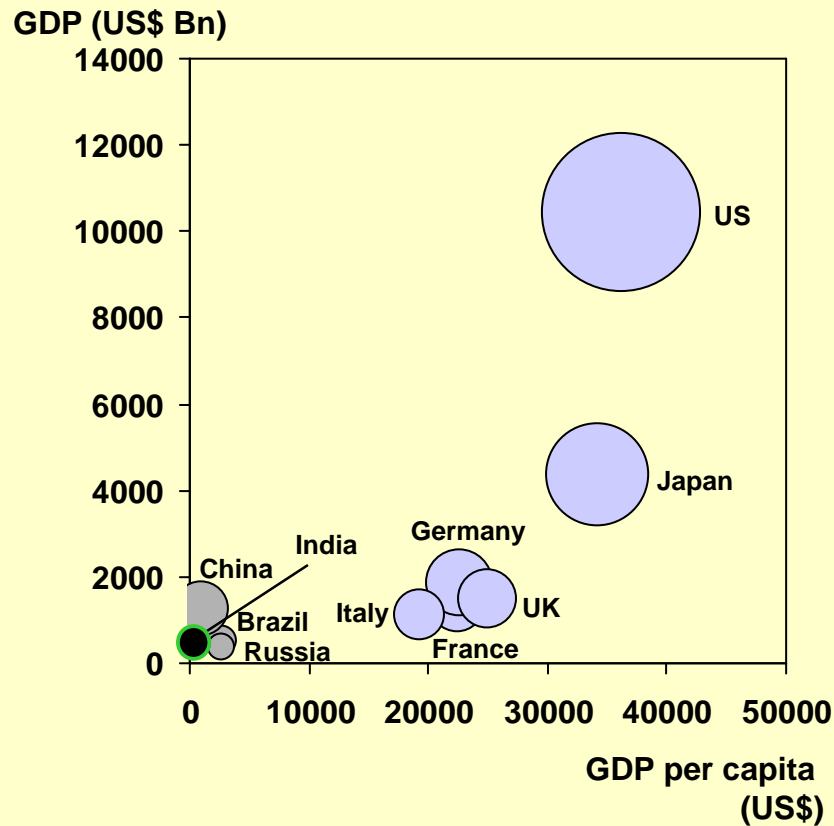
Challenges

- Global
 - Economic recession
 - India in renewed group of nations – G-20 replacing G-8
 - climate change, water, energy, security and peace
- Local
 - Problems of physical infrastructure, education & skill development
 - Inclusiveness of innovation

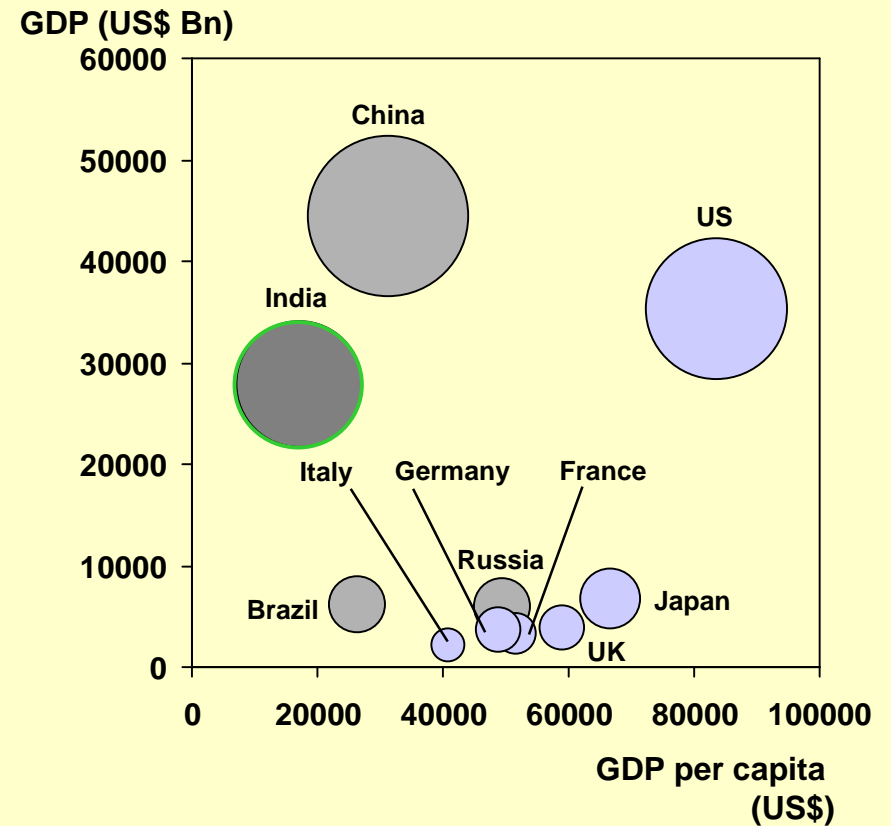
INDIA RISING

Next Billion; Local Dynamios; Global Challengers

GDP vs GDP per capita in 2002

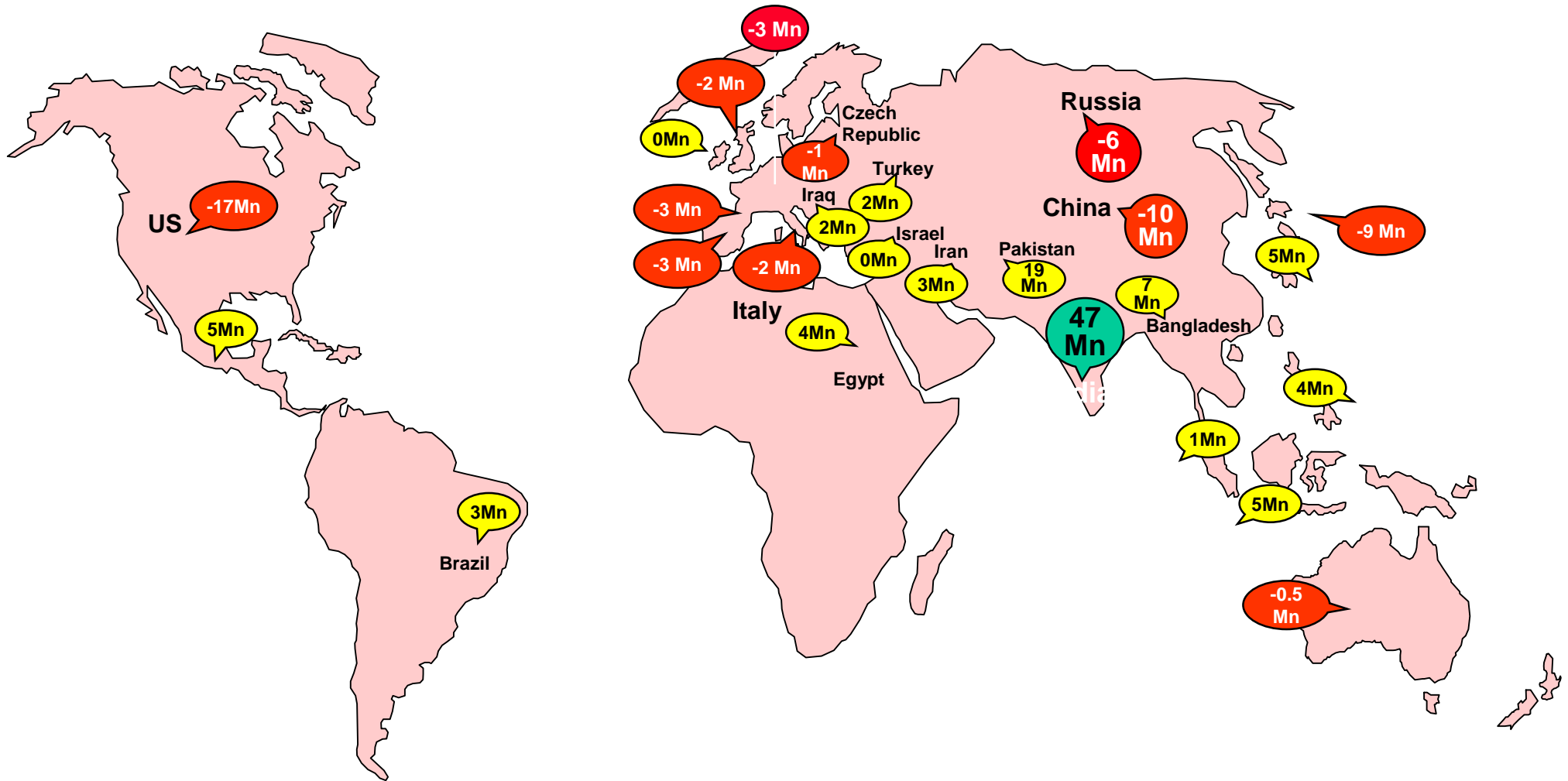


GDP vs GDP per capita in 2050



Bubble size corresponds to GDP size

FUTURE ENERGY FIELDS (Young Population 2020)



Innovative Strategies

Create incentive structure focusing on :

- ~ Revamping education system focusing on creativity and innovativeness (*pool of human resource for sustained innovation*)
- ~ Improving infrastructure – physical and research involving private participation
- ~ Integration with International Innovation System
 - modes : Diaspora, collaborations, global fora's, learning from role models etc

“PAHALE INDIA” : INDIA FIRST

FIREFLIES ARISING

Integration
with the world



Exclusive
growth and
development

Inclusive growth
and
development

Isolation for
the world



Thanks for your patient hearing