

The Evolving Paradigm for Global Innovation: Issues & Challenges

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"FLUIDITY"

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Innovation

SPEED!

The New Face of Global Competition in the 21st Century



Innovation Moves Center Stage

“There are no strategies for creating wealth in the long-term that are not driven by innovation.”

*Gary Hamel
Fortune
Sept 6, 2004*

The New World of Knowledge

“Ideas and innovation have become the most important resource, replacing land, energy and raw materials. As much as $\frac{3}{4}$ of the value of publicly traded companies in America comes from intangible assets, up from 40% in the early 1980s.” According to Alan Greenspan, former Chairman of the Federal Reserve, “the economic product of the United States has become predominantly “conceptual.” Intellectual property forms part of those conceptual assets.”

Economist
October 22, 2005

Booz Allen Innovation Study (2006)

- Effective innovators excel at four key elements. ideation, project selection, product development, and commercialization.
- Companies better at squeezing benefits from R&D spending. R&D spending as % of sales, has decreased steadily since 2001; only 40% of the companies actually increased their spending rate in 2005.
- Deep pockets can be dry wells. Money cannot buy effective **innovation**. No significant statistical relationships between R&D spending and financial or corporate success.
- Patents generally don't drive profits. There is no statistical relationship between the number or even the quality of patents and overall corporate financial performance.
- One size does not fit all. R&D budgets vary substantially, even within industries, since companies are using a range of different **innovation** business models.
- Nearly two-thirds of the 2005 total was spent in just three industries: computing and electronics (26%), health (22%), and automotive (17%).
- Global **Innovation** 1000 firms spent \$407 billion on R&D in 2005, up 6% from 2004. **Global R&D** spending is highly concentrated among the top 1,000. The next 1,000 companies spent a total of a mere \$25 billion in 2005.

The Role of Talent

“Today, the heightened international competition boils down to a competition for human resources.”

HU Jintao, General Sec
of the CCP at the
1st CCP Conference on
“Creating a More Skilled
Professional Work Force”
Beijing, Dec, 2003

Global Talent Pool: Core Issues

- Is there really a global talent pool?—some suggest approx 2/3 of US S&E pool comes from abroad
- How is the globalization of talent tied to key international issues:
 - Competition --Development
 - National security --Innovation --Education
- What are the challenges associated with creating and maintaining an “attractive” pool of talent?: national/corporate/regions/NGOs
- What are the keys to realizing value from a talent pool?
- What are the barriers to a truly global talent pool? How much mobility is too much—from perspective of buyers and sellers of talent?

Features of Global Talent Pool

- Flat or declining growth in # of knowledge workers
- Steadily increasing reduction of college-educated, experienced boomers
- Slower immigration of skilled workers: US has had a 30% decline since 2001
- Intensification of competition in global hunt for talent
- Growing reliance on virtual, remote workers from emerging markets: by 2009, 1/4 (850m) of world's workforce will use remote access and mobile technology to work on the go or at home
- Corporations report talent "shortages"—45% firms in PwC study reported IT talent scarcity...and 61% predict situation worse in 3 years (2005)
- Value of intangible assets—everything from skilled workers to patents—has grown from 20% of the value of the companies on S&P 500 to approx 70%

Global Innovation--Talent Nexus

“Western business leaders cannot afford to focus their talent acquisition plans on the domestic workforce and skilled immigrants. Increasingly, organizations of all sizes will need to develop & manage remote, virtual project teams and an entire workforce in order to compete. The winners will build networks into the farthest reaches of the planet and master the challenges of assembling and designing a global virtual workforce.”

Human Resource
10/17/2006

Three major trends.....

- Moving into period characterized by three major features:
 1. Increased collaboration in R&D worldwide
 2. Growing reliance on off-shoring of R&D activities
 3. Expanded interconnections at sub-national level in specific specializations as part of formation of transnational R&D networks: less and less meaning to the concept of “national” innovation system”

A New Global Innovation Configuration—6 Key Drivers?

- Paradigm change—from talent pools to a pool
- Blame it on the software/IT revolution
- Intensification of international competition
- Simultaneity
- New emphasis on innovation speed
- 6 Cs
 - Capacity, capability, creativity, cost, capture and coordination

1. Paradigm change

- Five major continental economies enter global playing field: China, India, Russia, Brazil & Mexico: Not China vs. India but China + India + others!
- Plus the four Asian dragons (e.g. Korea)...and add in Ireland, Scotland, & Israel.....+ perhaps former E European economies
- Driven by communications, transport and IT revolutions
- Facilitated by economic & trade liberalization: WTO, etc.
- Supply chain is almost borderless: Li & Fung sourcing + contract manufacturing, e.g. Flextronics
- Onset of knowledge economy...on a global scale
- New corporate platforms for value creation & capture
- New focus on economies of speed/scope/skills not just scale
- World definitely getting flatter for some, not everybody!

Example A.

Changing Face and
Configuration of the
Corporation

The New “Innovation-focused” GE

- Imelt Revolution inside GE (leadership beyond Jack Welch)
- “Imagination Breakthrough” projects
- More globally integrated workforce
- Strategic role of global labs as innovation magnets and catalysts
- Globalize R&D to get closer to customers
- Compensation tied to innovation performance
- Open up existing business boundaries of GE: generate new blockbuster ideas

The Globally Cooperative Corporation*

- New “*ecosystem of knowledge creation*” shifting toward transborder innovation communities and networks
- Focus on leveraging the collective intelligence of employees, customers, and outsiders around world
- Expanded use of outside knowledge networks: P&G—35% of products outside of firm—up from 20% 3 yrs ago
- Mass collaboration on the Internet: shared knowledge, social networks, communities
- Mathematical targeting of customers and segments
- Firms are more porous & decentralized...and “global”
- Inno-Centive: network of 80,000 independent problem solvers in 150+ countries
- Shift from focus on firms and markets to “peers”

*“The Future of Technology,” Business Week, June 20, 2005

Accenture's "Connected Corporation"

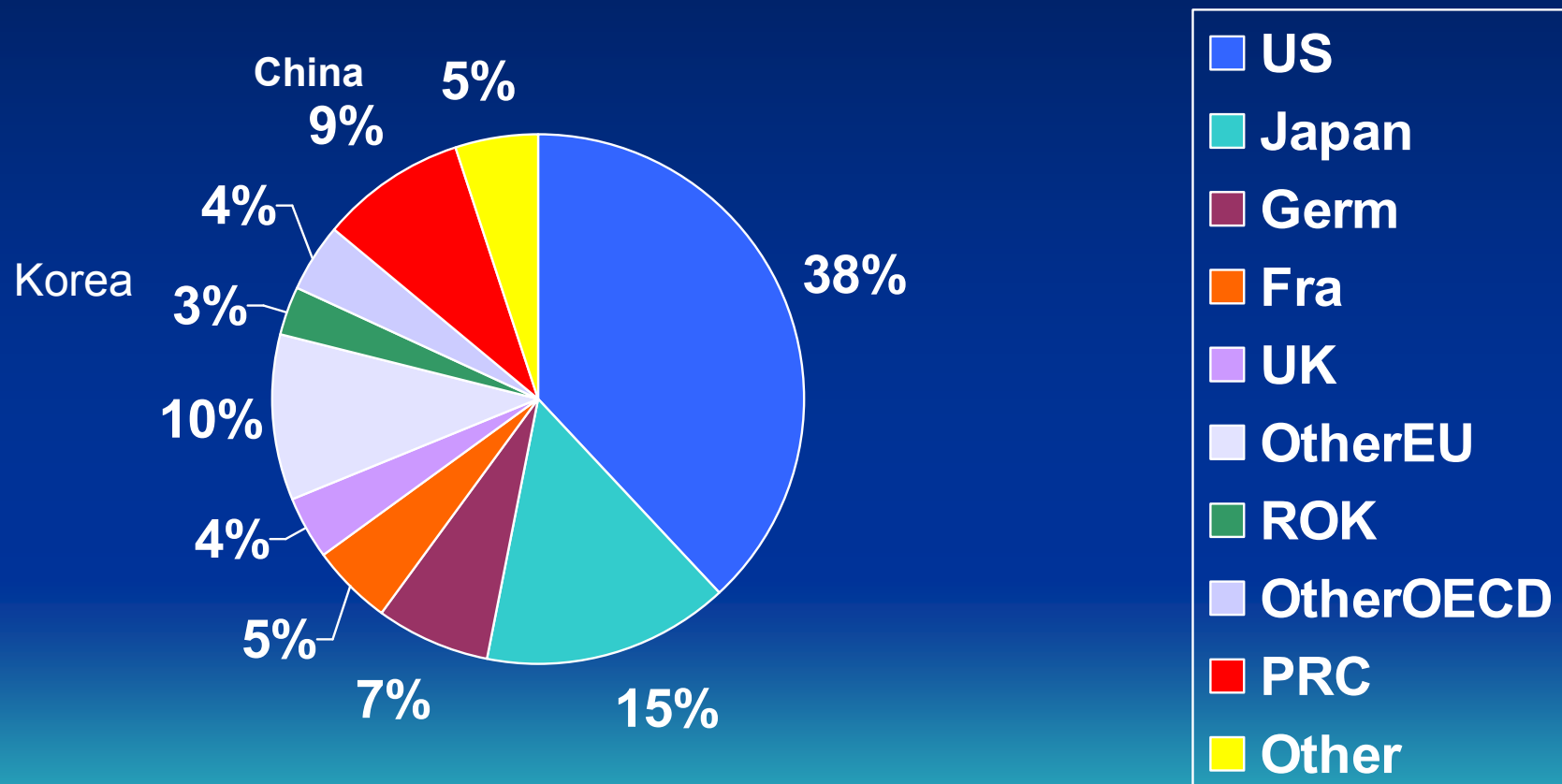
- “The corporate model of the 20th century—essentially *hierarchical* and *isolated*—is disintegrating.”
- “...corporations exist within an ecosystem characterized by a huge number of complex relationships and the blurring of industry and organization boundaries.”
- “...businesses are embedded in a complex system of networks. Many of these networks are underpinned by radical developments in information and communication technologies, though the implications of these changes go well beyond the technological.”
- “...for CEOs, the greatest challenge in [the] new environment is ensuring that the corporation makes the right connections.”
- “Competing successfully in the new ecosystem requires not only being customer focused but also customer driven. This means placing the customer at the center of everything the corporation does—even integrating customers into areas such as product design and the supply chain.”

Example B.

The Rise of China

Global R&D Spending: China Moves to #3..& perhaps #2 (2007)

Total World R&D = US\$764 billion in 2003 and over US\$1.0 trillion by beginning of 2007



Source: AAAS, Washington DC, 2005 (numbers adjusted for purchasing power)

Hu Jintao on “independent innovation”

“Independent innovative capability (zizhu chuangxin) is the core of national competitiveness. A nation should underscore independent innovation provided it wants to succeed in development and benefiting the world. China should do more to advocate the spirit of independent innovation, improve its mechanism for such innovation and its capability for original innovation, and innovation through integration or learning from imported technology.”

Hu Jintao

November 26, 2005

Changing Drivers of PRC Growth

Low Cost Labor
Drives Growth

1985



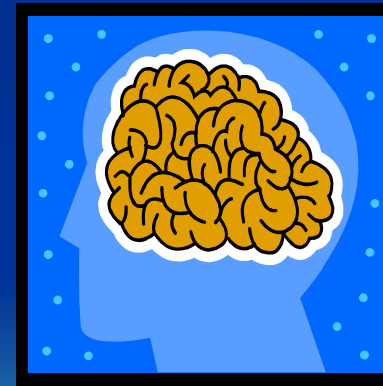
Low Cost Capital
Drives Growth

1995



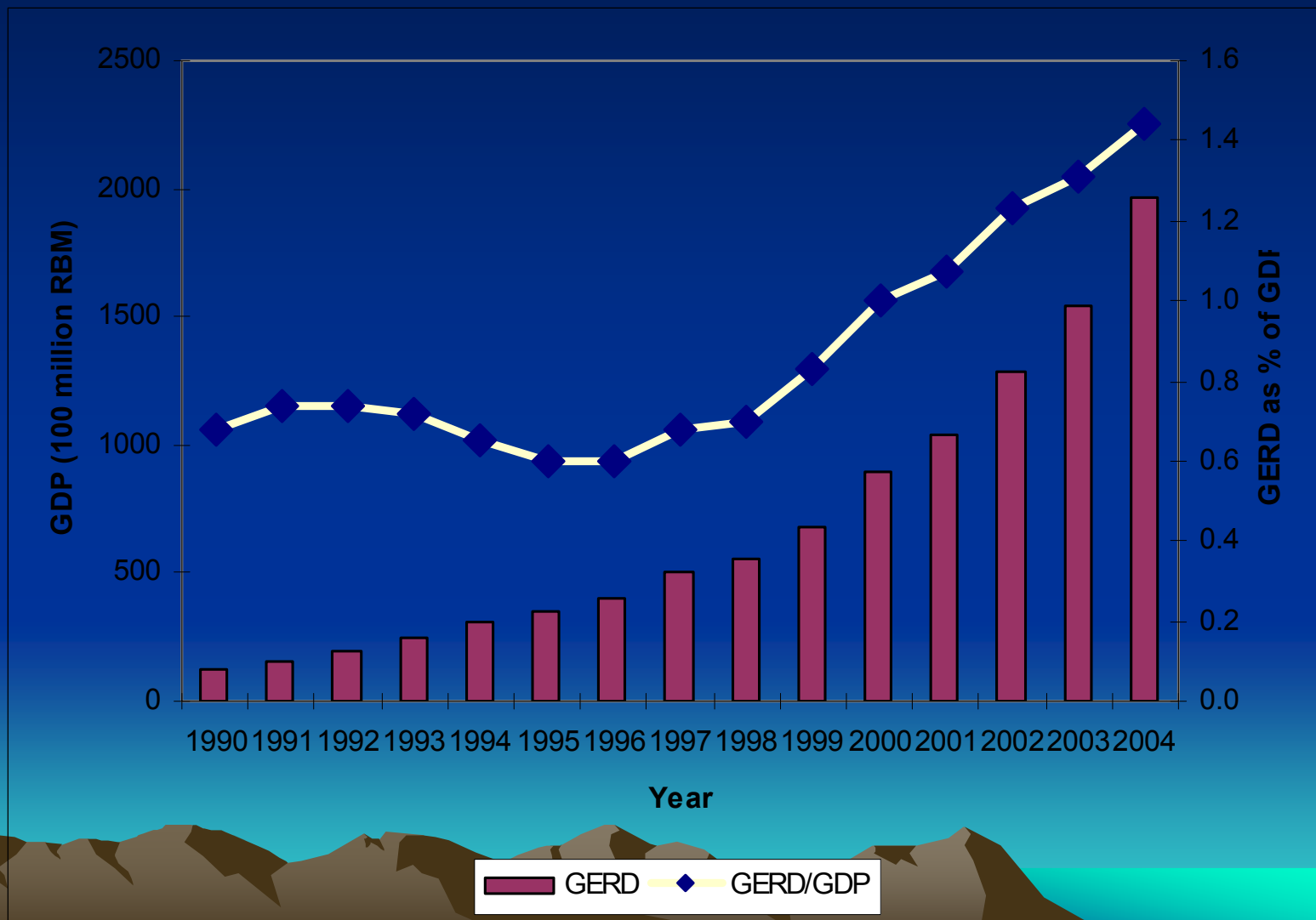
Low Cost IP
Drives Growth

2005



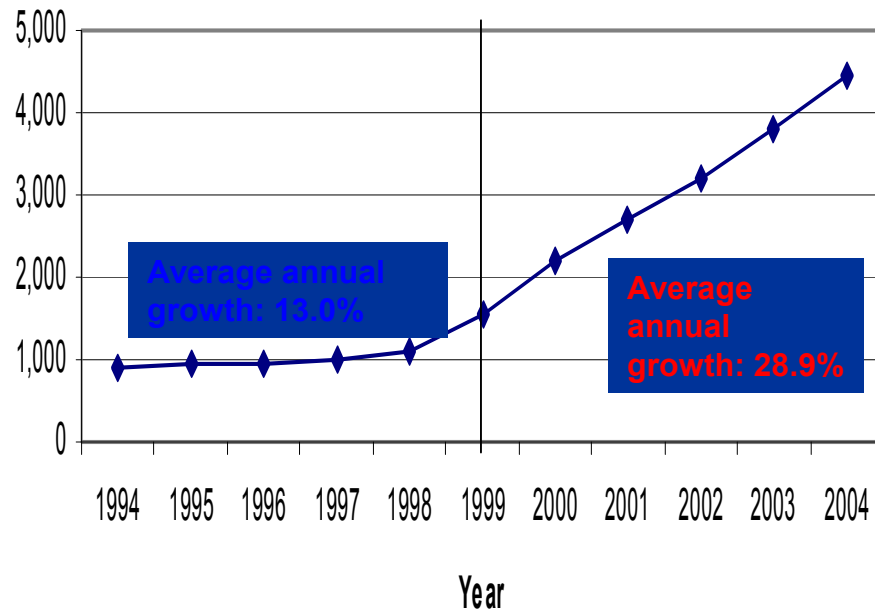
Source: DeWoskin and Stevenson, April 2005.

Growth of GERD in China

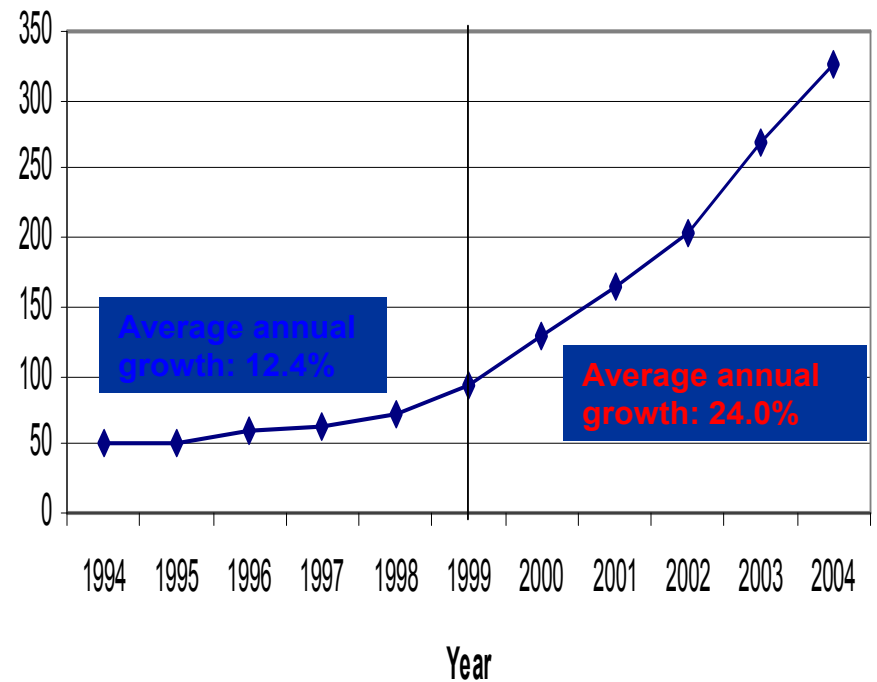


The Supply-Side of the Talent Pool

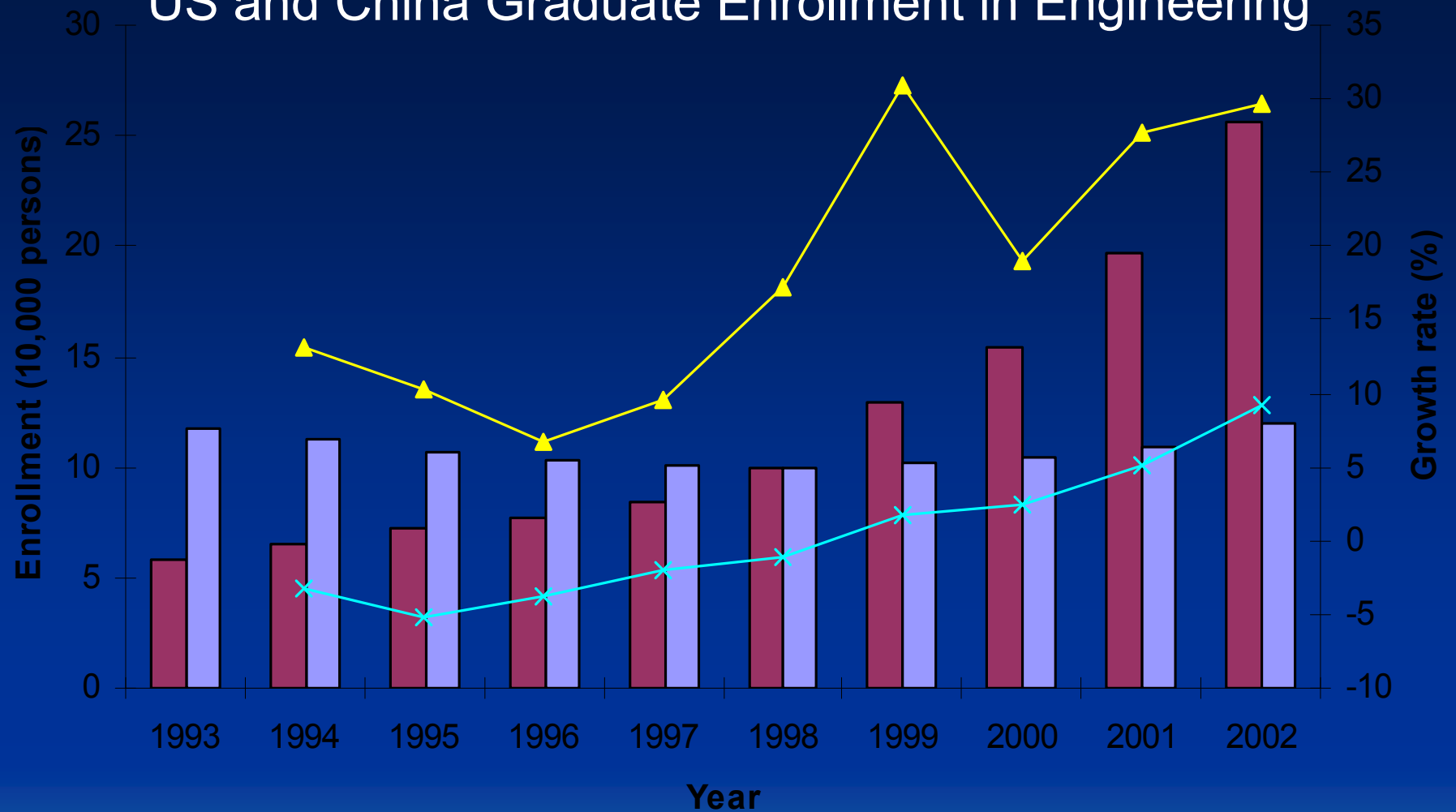
New enrollment at regular institutions of higher education (1,000 persons)



New enrollment in graduate education (1,000 persons)



US and China Graduate Enrollment in Engineering



■ Enrollment (Engineering)-China ■ Enrollment (Engineering)-USA
▲ Growth rate-China × Growth rate-USA

Source: NSF and MoEd (PRC)

China's Evolving Challenges...

- Build an innovative nation.....
- Create an harmonious society...
- Form a collaborative economy???
 - cultural, political, logistical & managerial challenges

2. Software revolution

- Low barriers to entry: smaller role for capital
 - Relentless technical change + new business models
 - Limited government role
 - Leveraged model of engineers/technical talent across broad platforms: 70% cost in people
 - Structured industry re: value chain segmentation
 - Standards set across large market base
 - India has nearly 70% of CMM Level 5 sites in world—China coming!
 - Fostered focus on provision of IT/business services
 - Follow manuf: production & consumption not in same location
-leading to global search for specific skills/costs

3. Intensification of competition

- Shift from variable cost to fixed cost competition: everyone has equal access
- Integration of capital markets
- Active search for new markets → saturation at home
- Technological leveling → complementarities
- More rapid movement of technology overseas at earlier point in life cycle: win through tech advantage.....need to overcome 'talent constraint'
.....leading to globalization of activity from medicine to commerce, from law to accounting

4. Simultaneity

- Not just about costs...
- Not just about time....
- Not just about resource access...
- Not just about access to cheap capital....
- Not just about leadership....
- Not just about organization design....
- Not just about technology...
- And...not just about cross-cultural sensitivity...

....but about doing all of these things well at same time, all the time, any time, any place, and anywhere....with the **RIGHT PEOPLE**

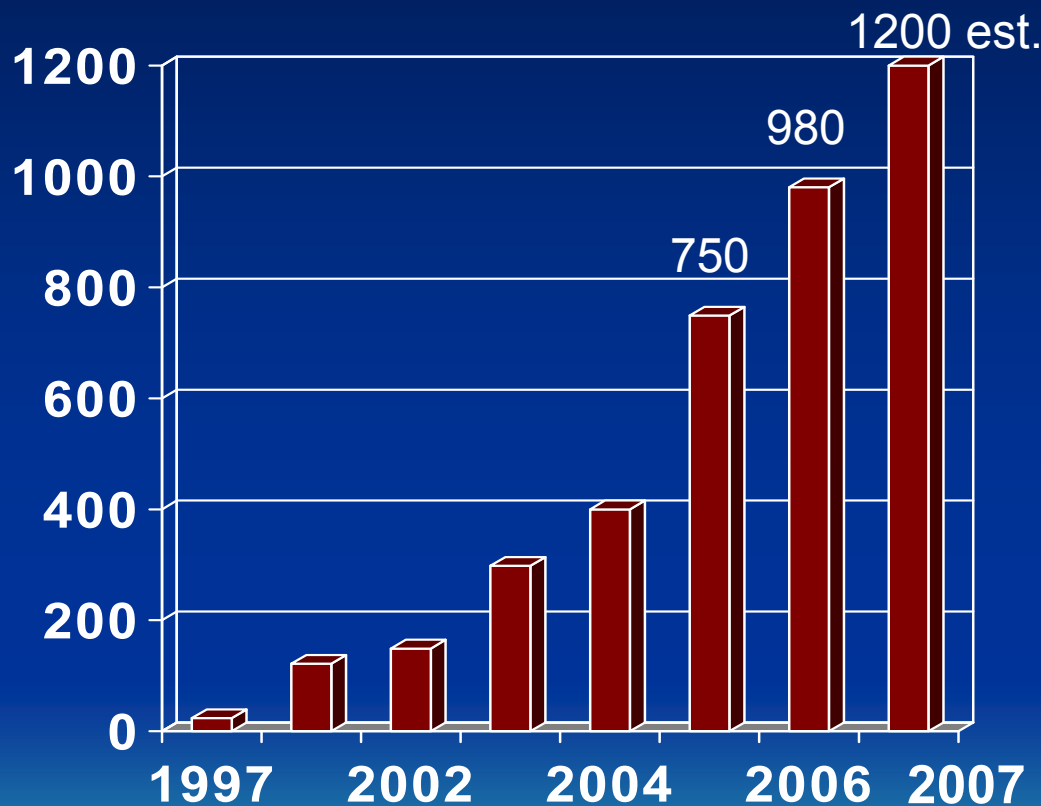
5. Innovation speed

- Acceleration in tech development: less time between initial recognition → full commercialization
- Greater emphasis on turnover in new product & service introduction: demand from industrial/ consumer users, e.g. Akihabara (Tokyo)
- Tech excellence = national priority → urgency
- Technology attracts technology: location matters (Porter)
- New knowledge develops from within and across networks.....new R&D configurations
.....innovation pace has become the life blood for all organizations...driving demand for brains instead of brawn
- Innovation not about profit, but about basic survival

NAS MNC R&D Study

- Research work of MNCs will increasingly be sent to strong, fast growing economies with strong education systems
- More than 38% of 200+ MNCs surveyed plan substantial changes in the worldwide distribution of their R&D work over next 3 years
- NAS study reinforces earlier study by Economist in 2004
- Lower labor costs and tax incentives not the key drives: quality of S&Es and local product adaptation
- Huge shift about to occur in knowledge creation activities: impact on OECD nations huge

The number of R&D centers established by foreign companies in China has witnessed a dramatic increase over the last 4 years—reaching 980 by end of 2006



■ Registered foreign funded R&D Centres in China

- MNC R&D centers are expanding focus from only the Chinese market to global markets
- Foreign companies have changed their core strategy in China. They now are bringing world class technology rather than simply 'tweaking' existing products for local market.
- At end of 2006, India had 150+ foreign R&D units.

6. Search for talent, globally

- Issue of global talent is not simply about cost reduction and job displacement....6Cs
 - Capabilities expansion: new skills
 - Capacity enlargement: pursue more opportunity
 - Creativity enhancement: new approaches/ideas
 - Cost abatement: with manageable spending
 - Capture & retention of talent....NOT UNLIMITED
 - Coordinated across time and space: manage transactions costs and risks, e.g. IPR, regulatory

Critical Innovation Success Factors

- Breakthroughs occur most often when a variety of people with disparate interests and backgrounds focus on a shared problem or process
- Innovation comes from channeling inspiration and creativity as often as it does from any R&D lab
- Growing R&D costs driven by increasing complexity of new generation of products & services requiring integration of technologies that span multiple disciplines from pure physics to biotech—which requires expensive multidisciplinary approach that few firms can handle on their own

Core Skills for Managing Across Borders and Cultures

- **Leading and managing cross-cultural, cross-functional teams**
- **Leveraging technology across borders and cultures**
- **Cross border market assessment and evaluation**
- **Effective communications & collaboration across borders and cultures**
- **Managing across multiple regulatory environments**
- **Managing risk and uncertainty on a global/local level**
- **Managing the ethical challenges of a multi-cultural world**

Is the world of games/gaming preparing people for the new demands of globalization?

Some parting thoughts...

- How really “flat” is the world in terms of innovation?
- Is the demand for talent an “innovation nirvana” for developing nations?
- How “soft” is the demand for talent? How might technology change the nature of demand?
- How comfortable are companies (MNCs and emerging market firms) with managing new global innovation activities? What types of new skills are required?
- How significant are ethnic-based networks of innovation & talent?—do multiethnic societies have advantages?
- What about new innovation alliances, e.g. India + China? What about regional alliances—Japan, China and Korea?
- What policy factors are helping to make innovation so strategically important, e.g. national security, terrorism, etc

Thank you

Extra Slides

Definition of Innovation

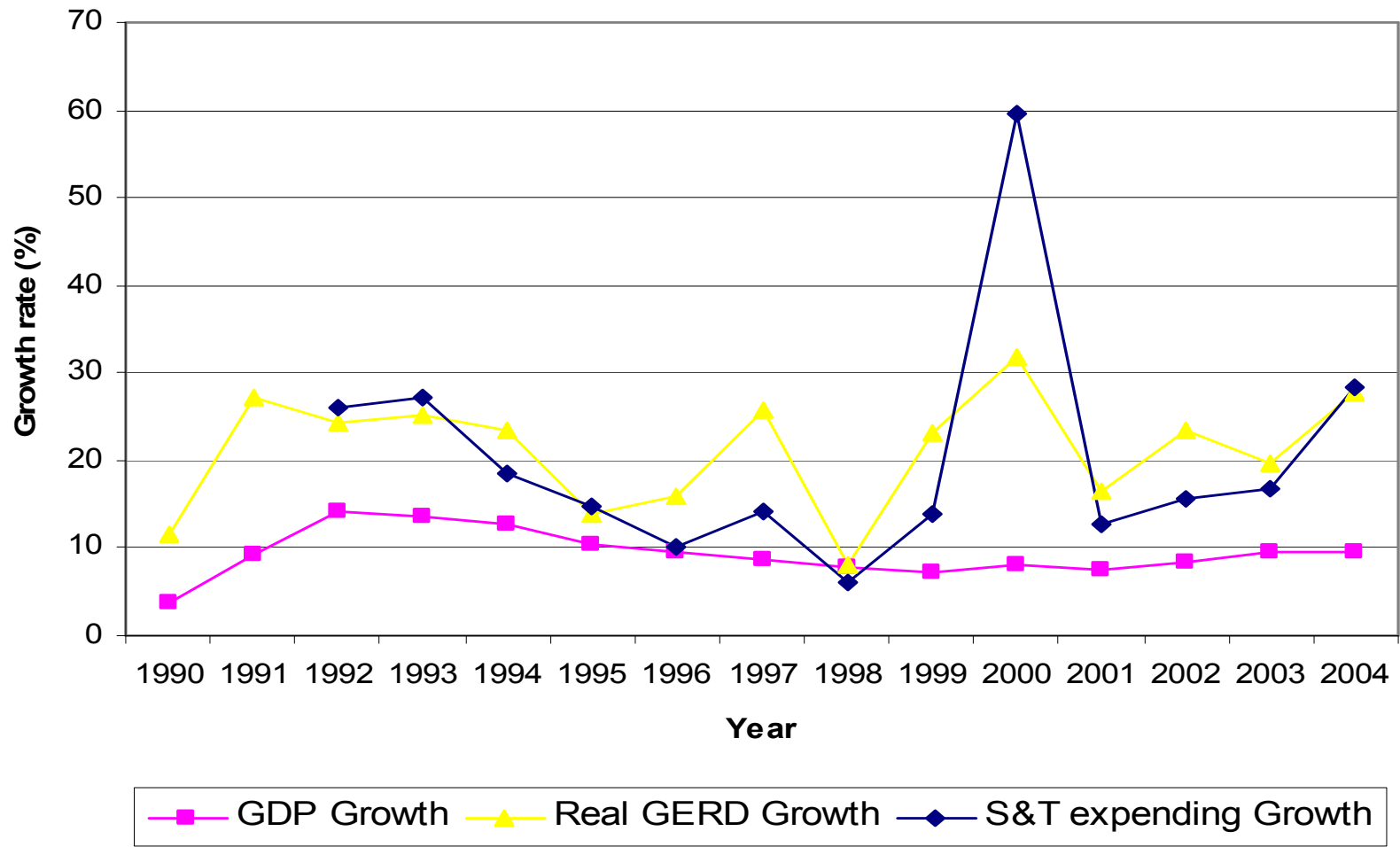
- ***Innovation refers to the process that transforms ideas into commercial value:***
 - **Introduction & commercial sale of a new or improved product**, e.g. Pentium chip, Remington typewriter, tungsten filament light bulb,
 - **Introduction & commercial use of a new method of production**, e.g. Henry Ford's production line, the Pilkington float glass process, and the steam engine.
 - **Introduction of a new form of business organization**, e.g. franchising, co-operatives, joint ventures and co-production and outsourcing agreements,
 - **New uses for existing products**. e.g. the electronic computer found its first uses in military applications such as calculating cannon trajectories. It's uses later broadened to include many more applications.
 - **New markets for existing products**. e.g. the donut was invented in Germany and subsequently spread throughout the world.
 - **New distribution channels**. e.g. the internet is a new distribution channel for selling books.
- **Distinction between “invention” and “innovation:** invention is the creation of a new idea or concept, and innovation is turning the new concept into commercial success or widespread use.

Barriers to who can play and who wants to play innovation game

- Supply Side
 - Inadequate investment in education
 - Skill mismatch—demand versus supply
 - Poor IPR protection environment
 - Exchange rate issues
 - Ability to engage in/manage collaborative tasks
 - Language issues
- Demand Side
 - Cross-border managerial challenges and inhibitions
 - Nurturing a “culture” for creativity
 - Managing country risk, e.g. government intervention
 - Real or potential “glass ceilings”
 - IPR concerns
 - National security issues--dependence
 - Privacy

Growth of GDP vs. GERD, S&T Spending

Since 1990, S&T spending has been growing about twice as fast as the overall economy



Corporate Responses to New Global Technology Environment

Corporate Resilience

“In the past, executives had the luxury of assuming that business and other organizational models were more or less immortal. Organizations always had to work to get better, of course, but they seldom had to get different—not at their core and not at their essence. Today, getting different is the imperative.”

Gary Hamel
Harvard Business Review

Talent: The Only Sustainable Edge

“In the past century, policy makers have generally crafted economic agendas around overarching goals defined as natural resource development, industrial development, or development of robust financial markets. ...economic policy agendas of the twenty-first century must instead focus more aggressively on talent development. Development of other resources and markets will of course continue to be important. But the value of these resources and markets will increasingly be shaped by the relative success in building comparative advantage in talent markets.”

From: J. Hagel and J. Brown, The Only Sustainable Edge (2005), p.164

Whither China, India & Korea in Global Innovation Game?

- Competition becoming more fierce
- Talent squeeze regionally & globally
- Local expectations kicking in
- Managing cultural distance
- Mastering complexity of global value chain
- Managing risks
- Safeguarding IPR
- Raising visibility without over-promising
- IT infrastructures: seamless global labs
- Leverage global stock of knowledge tied to global time clock tied to global talent pool

The WEF Davos Transformation

- New theme: Innovation, Creativity & Design Strategy
- Cost & quality integrated with innovation
- Six special workshops
 - Building a Culture of Innovation
 - Making Innovation Real
 - Outsourcing Innovation
- Beyond outsourcing perspective
- India, not China..the new hot spot

The Globally Modular Corporation

- Transformational outsourcing—leveraging offshore talent to strengthen firm performance/productivity
- Introduction of radical biz models to change nature of competition
- Configuration of work processes on global chessboard—from payroll to product design
- Liberation to enhance innovation
- Move to the “totally disaggregated corporation”
- Management challenges ahead—biz culture and country cultures