

Building Knowledge Economies: The Critical Role of Education and ICT

From Vision to Reality
ICT for Education Leaders
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OUTLINE

- I. Setting the Context
- II. Knowledge Economy (KE) Framework
- III. Policy Interventions on the Four Pillars of the KE
- IV. Implementing the KE agenda
- V. Concluding Remarks

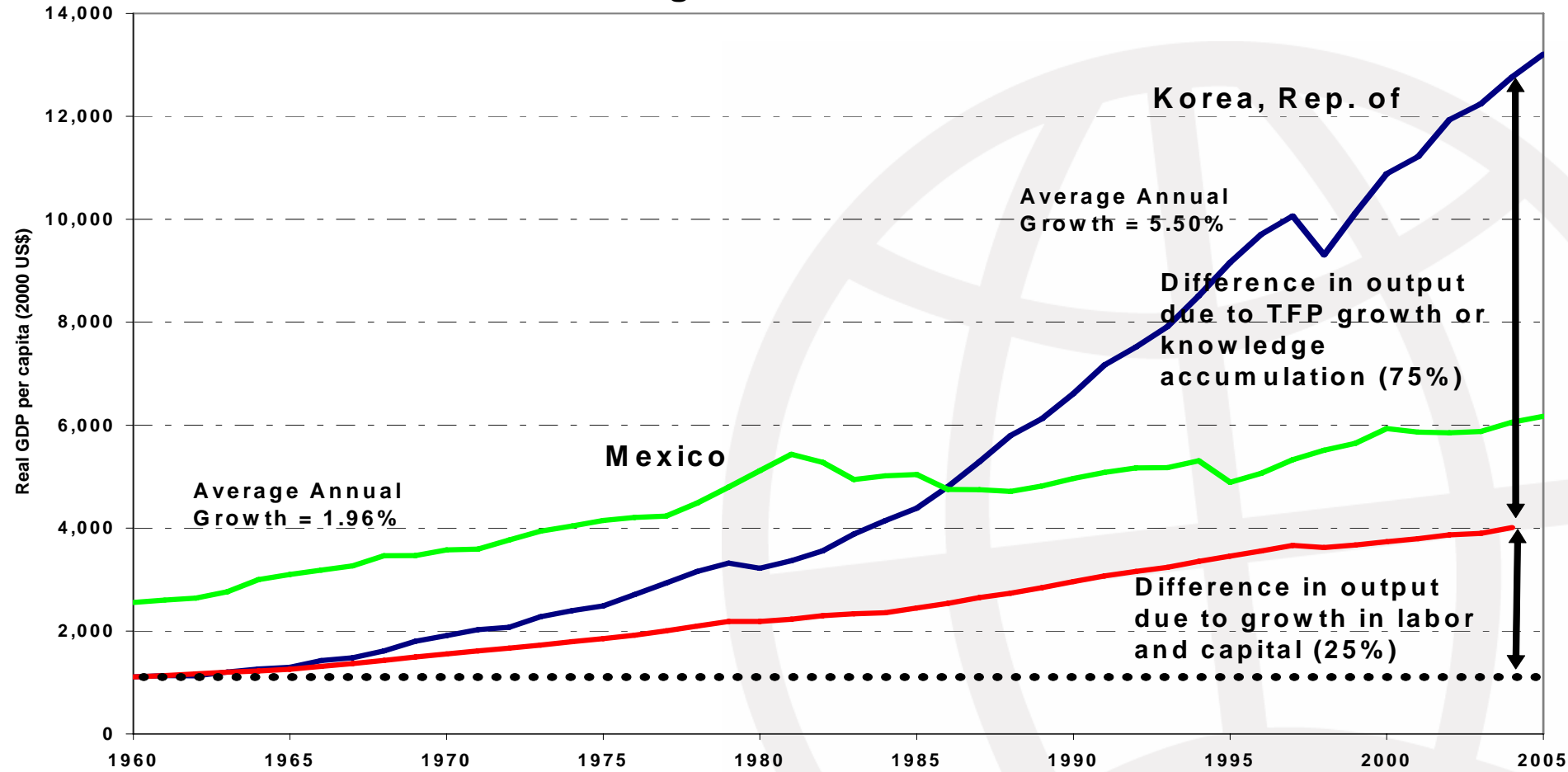
SETTING THE CONTEXT

- Dramatically changing global context
- New Competencies for the KE
- Narrowing of the Digital Divide
- K4D Program: Building Knowledge Economies

Dramatically Changing Global Context

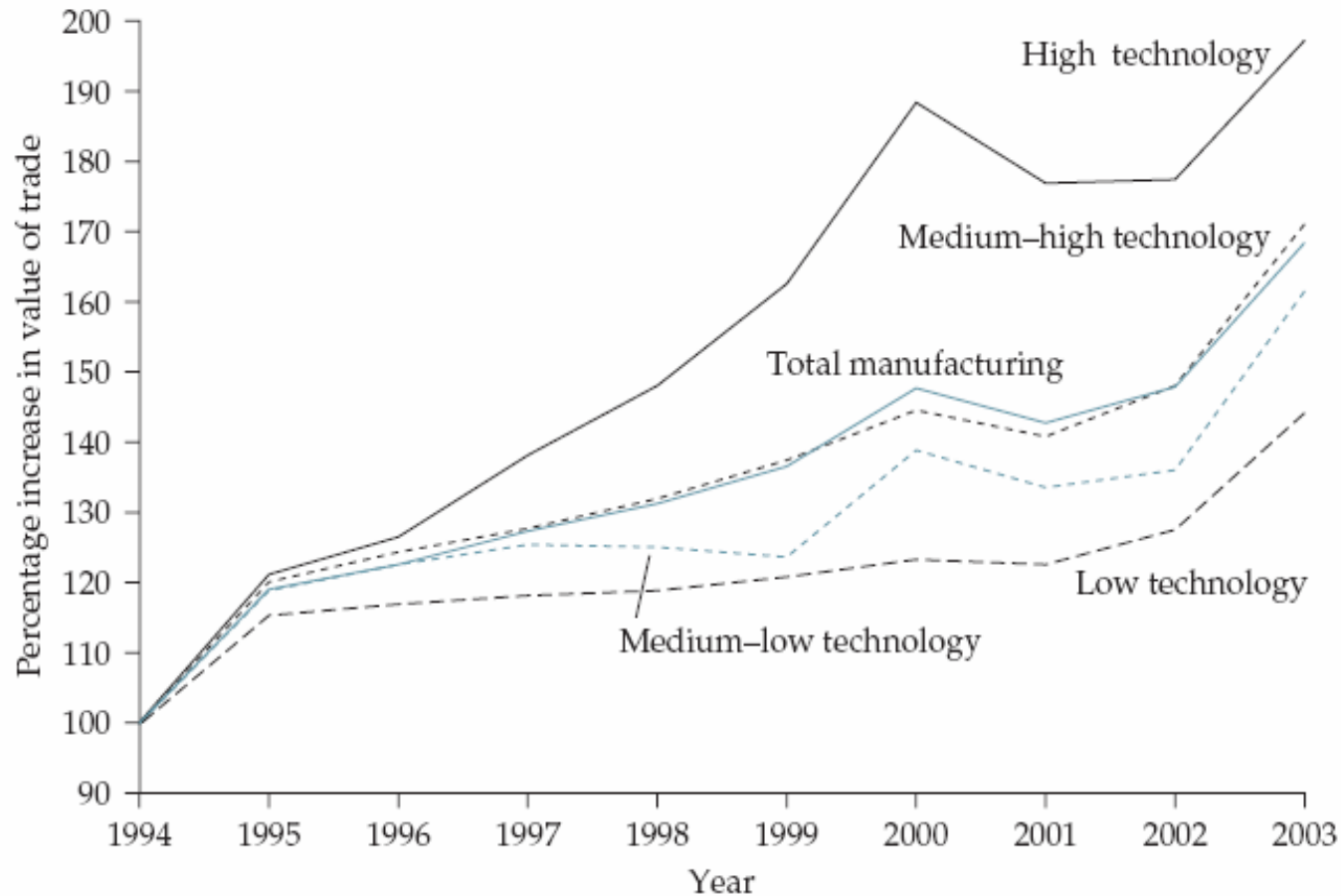
- Knowledge and innovation-based policies are spurring growth and competitiveness around the globe.
- Risk of growing “knowledge divide”
- Effective use of knowledge, broadly defined to include policy and technical knowledge, can have major impact on economic growth and development
- Countries need to develop explicit strategies to make more effective use of knowledge for economic and social development

Knowledge Makes the Difference

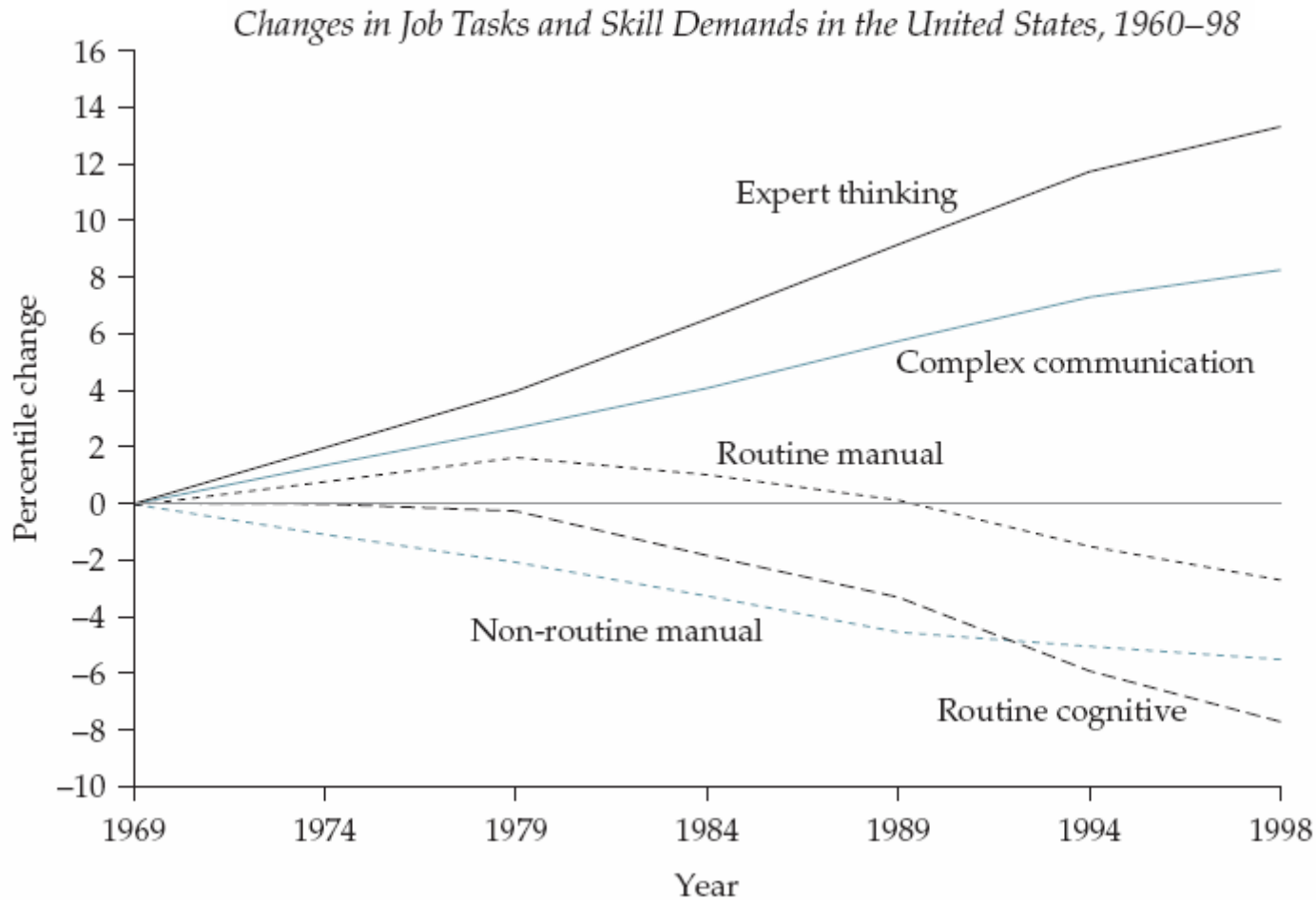


Growth in World Trade in Manufactures

- by level of technology of traded goods



Brain vs. Brawn: Path of the Future



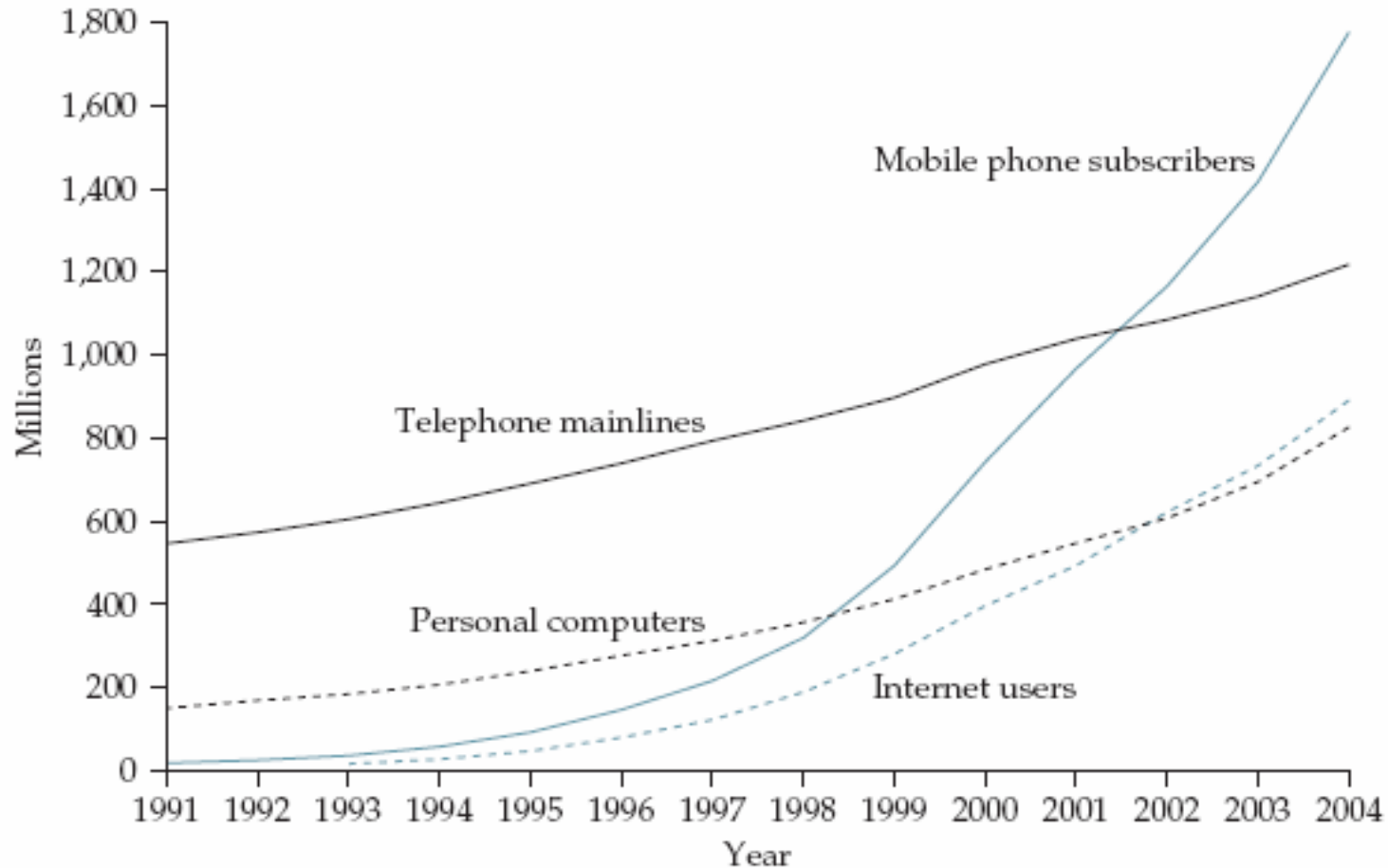
Source: Autor, Levy, and Murnane 2003.

New Competencies for the KE

<i>Competency area</i>	<i>Content</i>
Cognitive Problem solving	Language, communication, logistical and mathematical thought Observing, analyzing, identifying the parts of a problem, suggesting creative solutions, critical thinking, planning and project management skills Adapting knowledge to new contexts
Self-learning and self-knowledge	Being informed and motivated to learn, concern with one's own development, knowledge of one's capacities, ability to transfer knowledge from one context to another
Social	Working in a team, negotiating and creating constructive arguments, interacting, getting others to understand one's point of view, self-confidence, seeking and maintaining networks of social contacts
Motivation for work	Initiative, responsibility, commitment, and interest

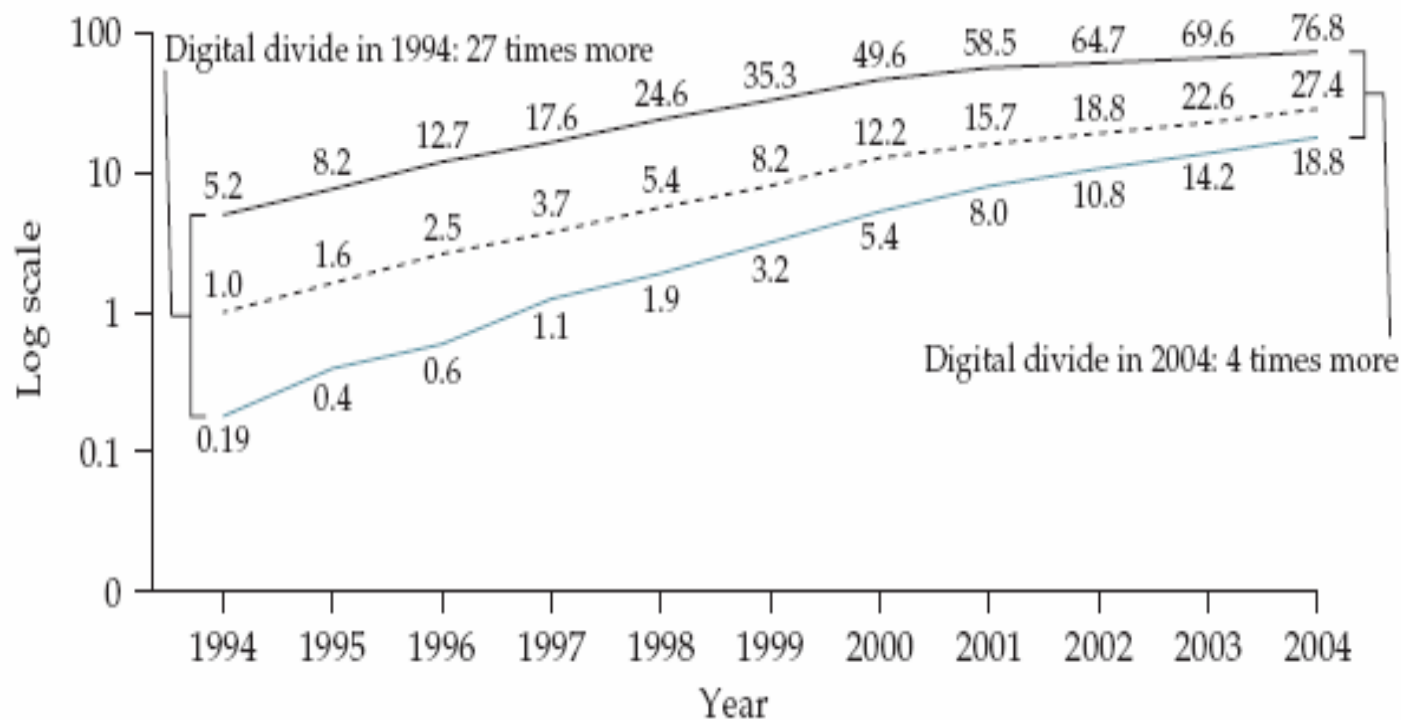
Source: Adapted from Vargas Zuñiga 2005.

World Growth in Key ICTs, 1991-2004



Digital Divide is Narrowing...

Digital divide: Differences in telephone and Internet use



— Developed -- World — Developing

Source: International Telecommunications Union, <http://www.itu.int/ITU-D/ict/statistics/ict/index.html> and <http://www.itu.int/ITU-D/ict/statistics/ict/graphs/mobile.jpg>

II. KNOWLEDGE ECONOMY (KE) FRAMEWORK

- KE Framework
- K4D's Four Pillar KE Framework
- Benchmarking the KE: Knowledge Assessment Methodology
- KE Scorecard
- Relative Performance on the KE over time

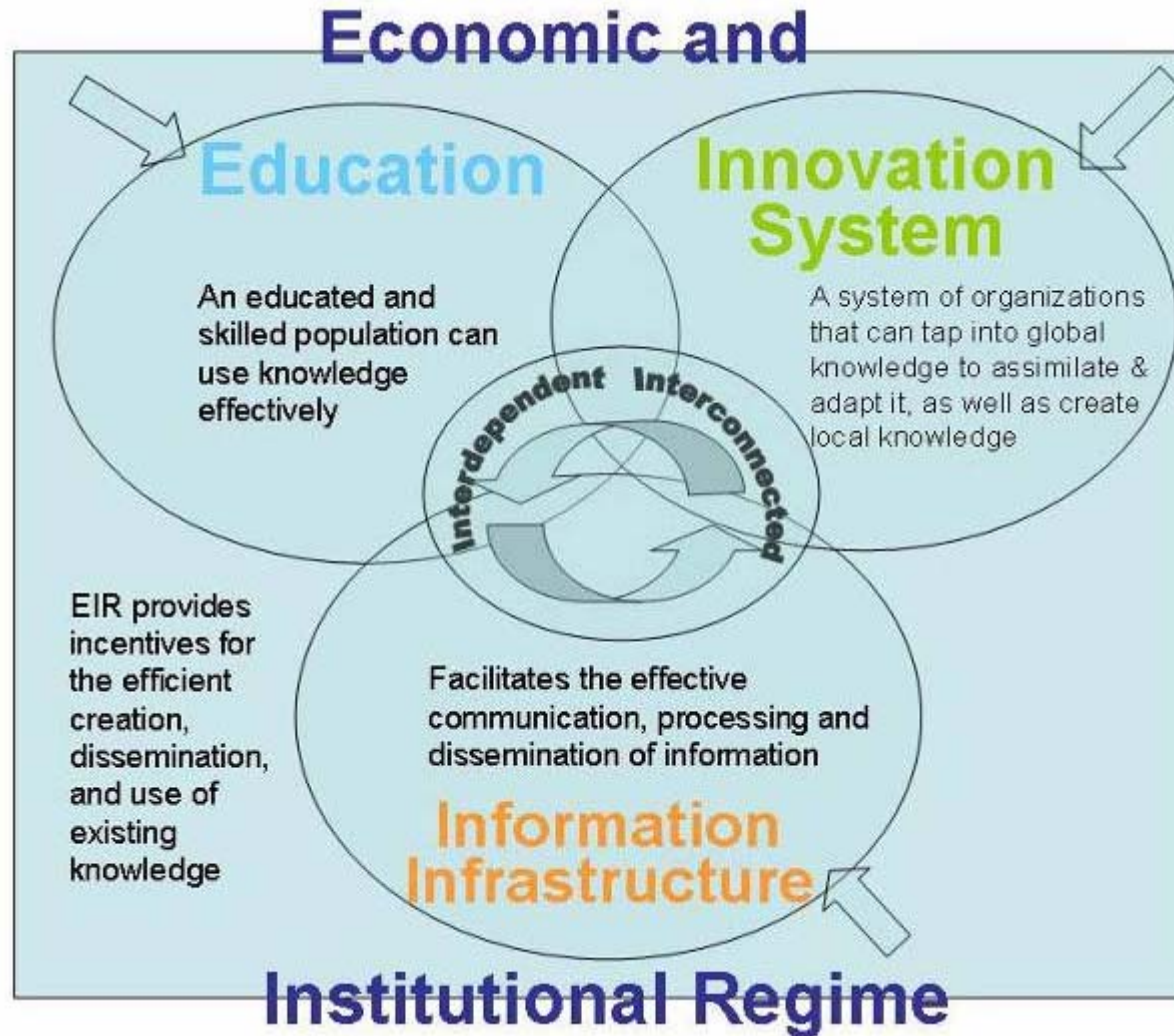
K4D Program: Building Knowledge Economies

- World Bank's 1998-99 World Development Report on "[Knowledge for Development](#)"
- Since 1999, [Knowledge for Development Program \(K4D\)](#) has been working with client countries on KE strategies
- "[Building Knowledge Economies: Advanced Strategies for Development](#)" is synthesis of research and operational work done by K4D with client countries on the KE
- It argues that whatever their level of development, countries should consider embarking on knowledge and innovation-based development process
- In these times of accelerated globalization, "grey matter" is a country's main durable resource
- Its exploitation for economic and social well-being is increasingly at center of development strategies.

K4D's Four Pillar KE Framework

- Appropriate **economic and institutional regime** that provides incentives for efficient creation, dissemination, and use of existing knowledge
- **Skilled and educated population** that can use knowledge effectively
- Efficient **ICT infrastructure** that facilitates the effective communication, processing and dissemination of information
- Dynamic **innovation system** of organizations that can tap into global knowledge and assimilate and adapt it, as well as create local knowledge

Four Pillars of the KE



Benchmarking the KE: Knowledge Assessment Methodology (KAM)

- Internet-based tool developed by the K4D team
www.worldbank.org/wbi/kam
- Based on the 4-Pillar KE Framework
- Provides basic assessment of countries' KE readiness
 - Highlights relative strengths and weaknesses
 - Helps in identifying policies/investments for countries' transition to the KE
- Comparisons performed on the basis of 83 structural and qualitative variables
- 140 countries, includes most OECD countries & more than 90 developing countries
- Data from WB, UN agencies, WEF, think tanks

Knowledge Assessment Methodology (KAM)

KE Pillars

1

Business environment

- Tariff and non-tariff barriers
- Rule of law
- Regulatory quality

2

Education system

- Adult literacy
- Secondary enrollment
- Tertiary enrollment

3

Information infrastructure

- Telephone lines per 1000 people
- Computers per 1000 people
- Internet users per 1000 people

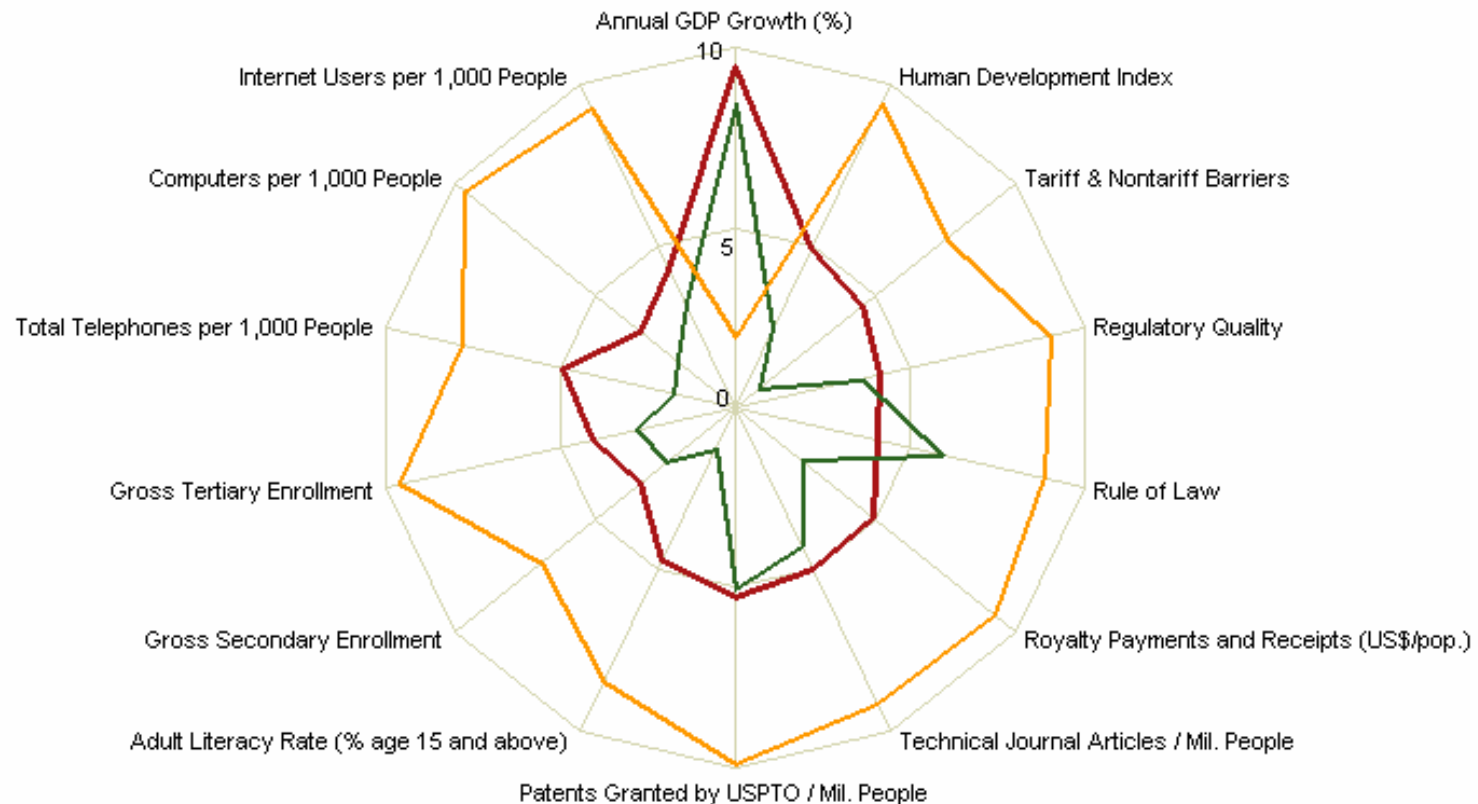
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Innovation system

- Royalty Payments and Receipts
- Technical Journal articles per million
- Patents granted by USPTO per million

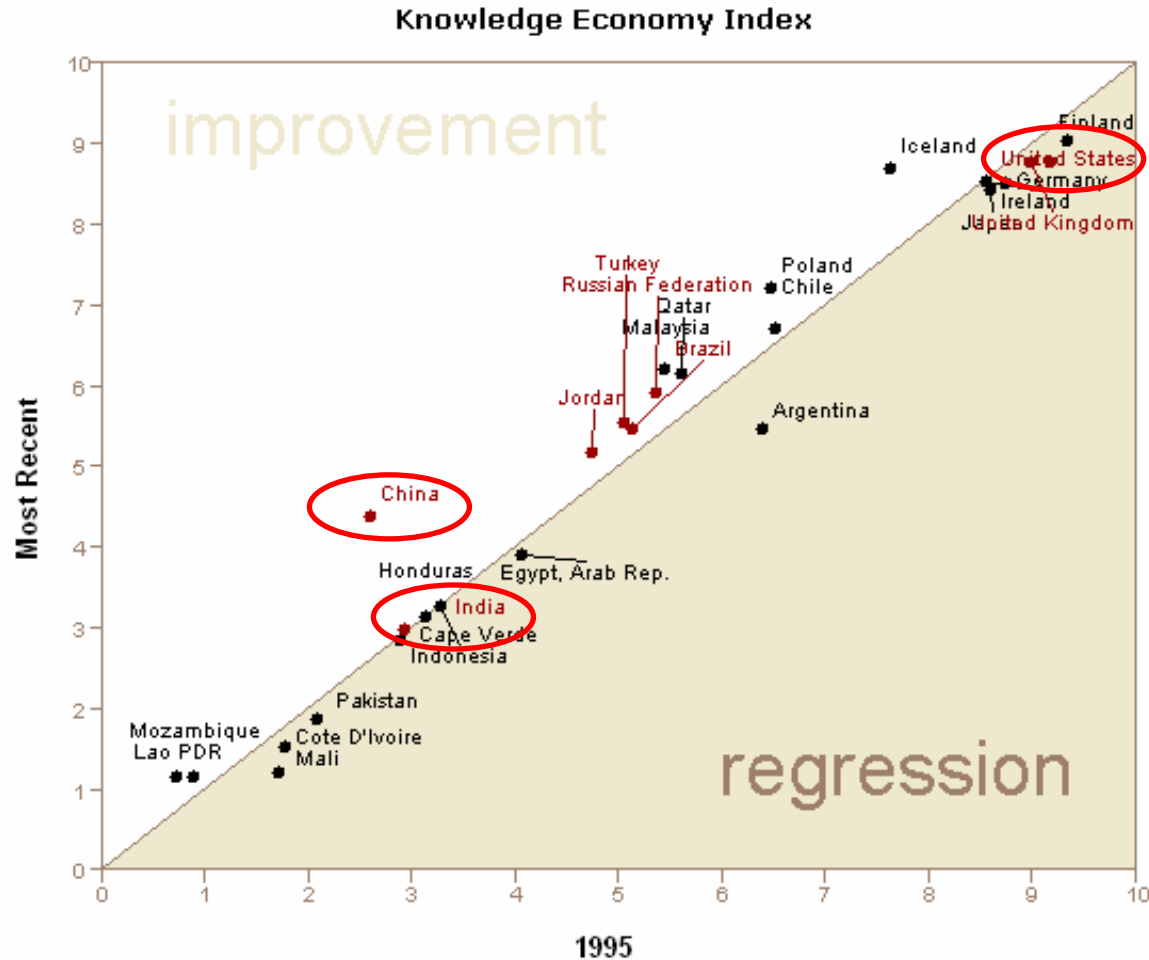
KE Scorecard

China, India, United States



Comparison Group: **All Countries**; Type: **weighted**; Year: **most recent** (KAM 2007)

Relative Performance on KE Over Time



III. POLICY INTERVENTIONS ON THE FOUR PILLARS OF THE KE

- Promoting Appropriate Economic and Institutional Regime
- Developing Skilled and Educated People
- Creating Efficient Information Infrastructure, including ICTs
- Encouraging Dynamic Innovation System

Promoting Appropriate Economic and Institutional Regime (EIR)

- Promote a competitive environment as stimulus for improved performance: a vibrant home-base for business
- Develop a financial system that mobilizes and allocates capital to its most productive uses, including developing sophisticated financial markets (venture capital)
- Strengthen legal and regulatory system to support efficient functioning of markets
- Secure strong rule of law that supports entrepreneurship
- Build modern and legal institutional infrastructure relevant for the KE, as for example, for IPRs
- Enhance labor market flexibility, including support for training/up-skilling
- Develop effective social safety nets to facilitate adjustment of labor to economic restructuring
- Strive for effective, transparent and accountable government

Developing Skilled and Educated People

- Develop a KE-boosting education system, with increasing number of knowledge technologists and integrators
- Address first generation challenges: access, equity, quality, gender balance
- Adjust teaching and learning environments to respond to new competency requirements (new skills for the KE: problem solving, communications skills, team-work)
- Expand opportunities and build competencies in secondary education
- Invest in relevant and high quality tertiary education, esp. in science and engineering
- Adopt comprehensive lifelong learning policies
- Strengthen vocational and firm-based education and training
- Improve financing of education, including clarifying roles of the public and private sectors

Creating Efficient Information Infrastructure, including ICTs

- Encourage a wide-open, competitive telecommunications sector; pay attention to policy issues (competition, pricing, regulation)
- Develop a diversified communications infrastructure (from radio all the way to telephony and the Internet)
- Develop the potential of new technologies for leapfrogging, e.g., mobile phones (m-banking)
- Develop strategies to mitigate against the Digital Divide (access, content, language—local language software)
- Enhance ICT literacy so that population has the skills/competencies to use ICTs
- Use ICTs as enablers in: E-government, E-business, E-education, E-health to provide a range of services needed by the economy

Encouraging Dynamic Innovation System

- Tap into Global Knowledge
 - Trade, foreign direct investment, technology transfer, licensing
 - Publication in technical journals, travel, internet, conferences
- Create and adapt knowledge
 - Role of public vs private R&D
 - Balance between basic vs applied R&D
 - Business – Academia – Research Links, so that research can be translated into products/services needed by the economy
- Disseminate Knowledge
 - Important for growth of more efficient enterprises
 - Key for sectoral growth, e.g., extension services for agriculture
- Use knowledge
 - Depends on education, skills, ICT infrastructure

IV. IMPLEMENTING THE KE AGENDA

- Building a KE means adopting a KE mindset
- Stages of Industrial and Economic Development
- Investing in KE Development
- Timeline and Impact of Reforms
- Sequencing and Scaling Up
- Importance of Vision and Implementation
- Creating Institutions for the KE



building KNOWLEDGE ECONOMIES

ADVANCED STRATEGIES FOR DEVELOPMENT

WORLD BANK INSTITUTE

Promoting knowledge and learning for a better world

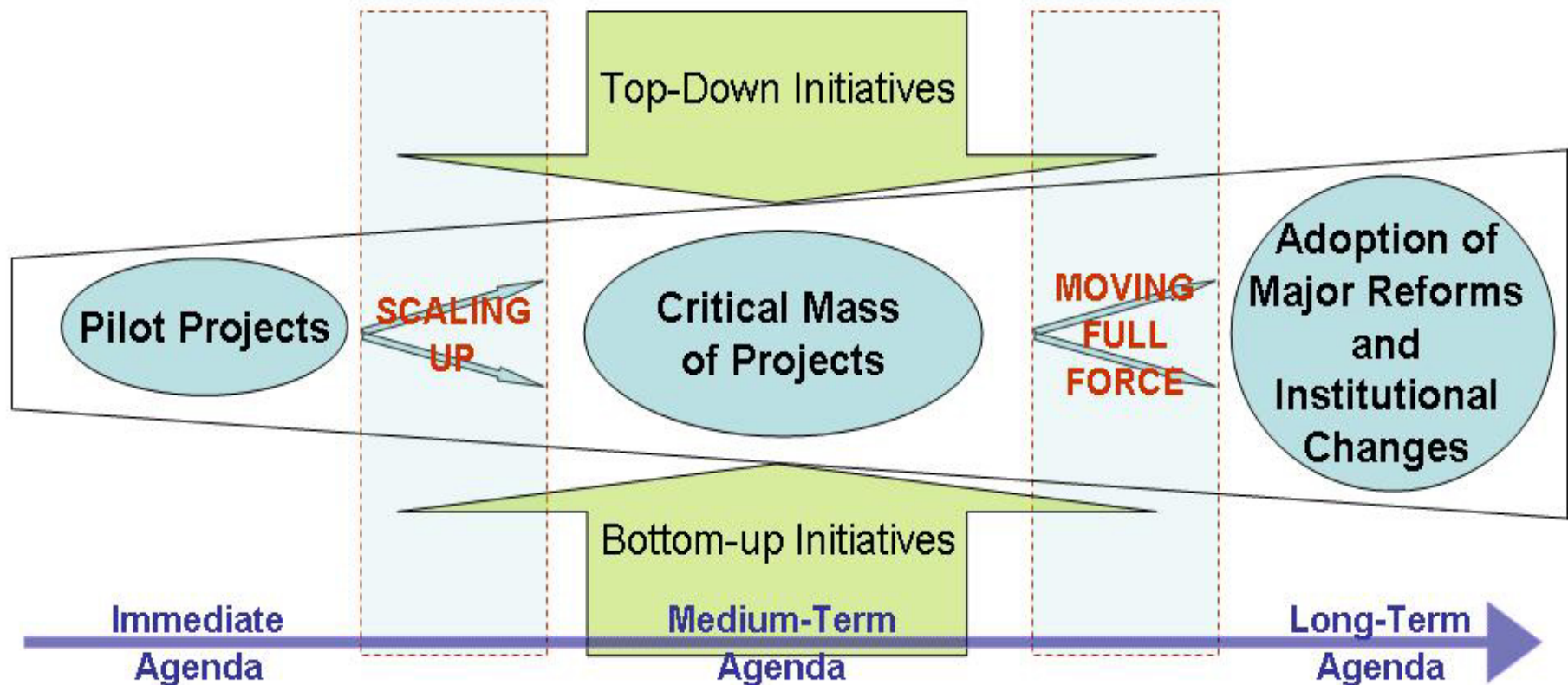
Building KE Means Adopting KE Mindset

	Liberalization Mindset	Modernization Mindset	Knowledge Economy (KE) Mindset
Is about:	Undoing things	Building things	Building on opportunities/being flexible
Creates:	<ul style="list-style-type: none"> •Freedom •Fluidity •Even playing field 	<ul style="list-style-type: none"> •Modern institutions •Rule of law •Good basic business environment 	<ul style="list-style-type: none"> •Vision •Winning niches •Vibrant home-base for business
Main Focus:	Stability, incentives	Productivity catch-up	Becoming globally competitive
Domain:	Economy	Economic, Social	Societal
Government Role:	<ul style="list-style-type: none"> •Get out of the way •Stop being an operator 	<ul style="list-style-type: none"> •Become a good regulator 	<ul style="list-style-type: none"> •Become an integrator



Sequencing and Scaling Up

How to Create a Virtuous KE Cycle?



WBI DEVELOPMENT STUDIES

KOREA

as a
Knowledge
Economy

Evolutionary Process and Lessons Learned

Edited by

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WORLD BANK INSTITUTE
Promoting knowledge and learning for a better world

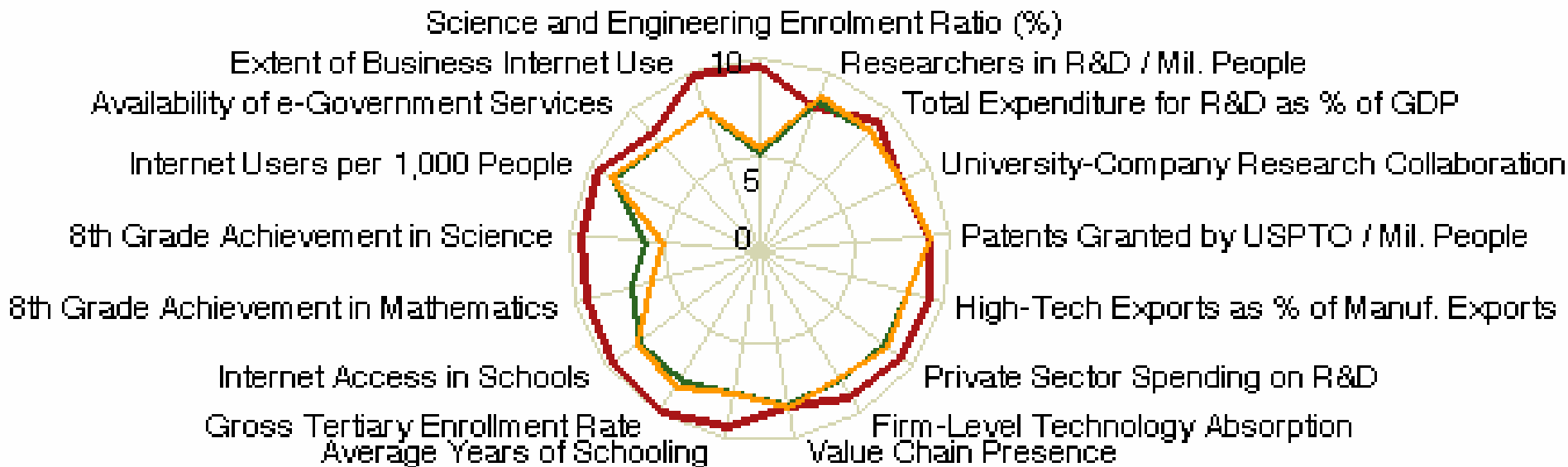
1. Put the KE at heart of country development strategy
2. Adapt the KE to country specificities
3. Build vision for a KE-based society
4. Act ambitiously on the 4 KE pillars
5. Change the role of the State and institutions to respond to KE needs and opportunities



Korea as a Knowledge Economy

(Selected Education, Innovation and ICT indicators)

Korea, Rep., High Income, Western Europe



Source: KAIM 2007 (www.worldbank.org/kaim)

Korea's Stages of Economic Development

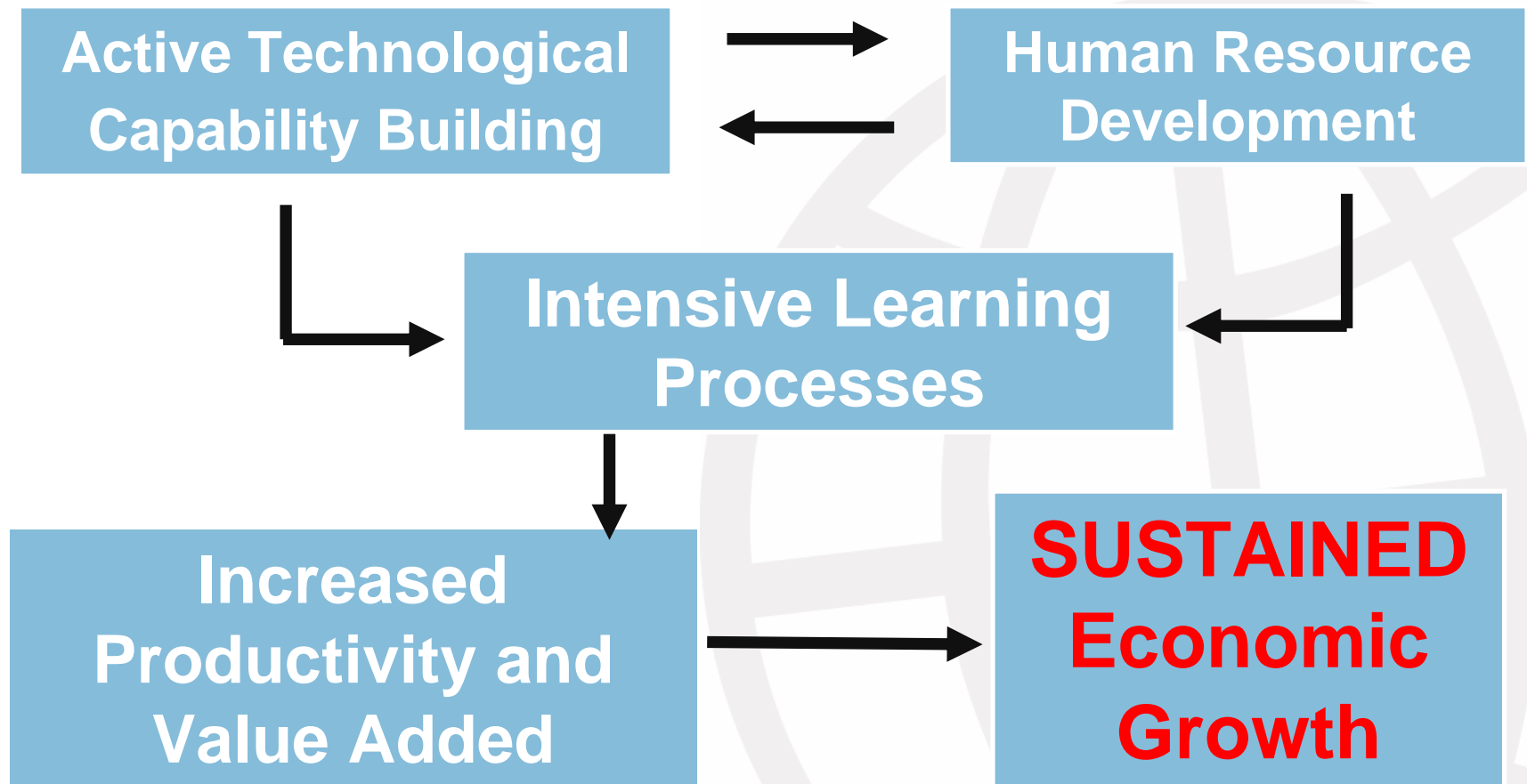
	<i>Development goals</i>	<i>Major policy directions</i>	<i>Macroeconomic governmental policy framework</i>	<i>Human resource development</i>	<i>Science and technology</i>
1960s	<ul style="list-style-type: none"> • Build production base for export-oriented industrialization 	<ul style="list-style-type: none"> • Expand export-oriented light industries • Mobilize domestic and foreign capital 	<ul style="list-style-type: none"> • Prepare legal and institutional bases to support industrialization 	<ul style="list-style-type: none"> • Increase literacy • Establish national infrastructure 	<ul style="list-style-type: none"> • Build scientific institutions, legal and administrative framework
1970s	<ul style="list-style-type: none"> • Build self-reliant growth base 	<ul style="list-style-type: none"> • Promote heavy machinery and chemicals industries • Build social overhead capital 	<ul style="list-style-type: none"> • Maximize growth, expand policy loans • Intervene in markets 	<ul style="list-style-type: none"> • Increase vocational training • Increase number of engineering graduates from colleges 	<ul style="list-style-type: none"> • Establish scientific infrastructure setting: specialized science and technology (S&T) institutions Daeduck science town
1980s	<ul style="list-style-type: none"> • Expand technology-intensive industries 	<ul style="list-style-type: none"> • Industrial rationalization • Decrease export subsidies and expand import liberalization 	<ul style="list-style-type: none"> • Stabilization • Enhance private autonomy and competition 	<ul style="list-style-type: none"> • Expand higher education system • Develop semiskilled labor capacity 	<ul style="list-style-type: none"> • Promote R&D and private research center promotion • Establish national R&D programs
1990s	<ul style="list-style-type: none"> • Promote high-technology innovation 	<ul style="list-style-type: none"> • Support technology development • Build information infrastructure 	<ul style="list-style-type: none"> • Liberalization • Reform and restructure 	<ul style="list-style-type: none"> • Develop highly skilled labor in strategic fields such as IT • Develop lifelong learning system 	<ul style="list-style-type: none"> • Leading role in strategic area: HAN programs
2000s	<ul style="list-style-type: none"> • Transition to knowledge economy 	<ul style="list-style-type: none"> • Promote venture business and small and medium enterprises 	<ul style="list-style-type: none"> • Globalization • Balanced national development 	<ul style="list-style-type: none"> • Increase research productivity • Improve quality of university education 	<ul style="list-style-type: none"> • Build national and regional innovation systems

Source: World Bank (2007). Building Knowledge Economies: Advanced Strategies for Development.

Importance of Vision and implementation

- In Korea, *Maeil Business* newspaper promoted “Vision Korea Project” as a national KE campaign
- Korea KE Strategy (April 2000): 3-year action plan focused on developing ICTs, expanding HR, developing knowledge-based industry, enhancing S&T, and eliminating digital divide
- To implement action plan, 5 working groups--19 ministries and 17 research institutes were established
- Ministry of Finance and Economy (MOFE) championed/coordinated KE policy agenda
- Every quarter, each minister submitted a self-monitoring report to MOFE, which published an integrated report detailing progress
- Mid-term results and adjustments to the three-year action plan were regularly implemented.

Korea's Knowledge Development Strategy



Concluding Remarks

- The capacity of countries to perform in the KE depends critically on the availability of highly skilled, innovative, and flexible human resources, especially in the area of science and engineering
- Adjusting education and learning systems for the KE requires sustained investments and strategic and systemic interventions
- ICT is transformative in nature and can accelerate the changes in education that are so needed in the knowledge economy
- What is most needed is a different type of leadership, and capacity development across the various education and learning systems

Thank you!

K4D's website:

www.worldbank.org/wbi/knowledgefordevelopment

KAM: www.worldbank.org/kam