Korea as a Knowledge Economy
- Lessons learned and challenges ahead -

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- Overview of Korea’s Development Process
- Policy Lessons
  1. Designing New Economic Regime
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- New challenges
The Korean Economy, 1945~2005

Limitations of Government-led Development

- Financial underdevelopment
- Over-investment (in HCI)
- Inefficient resource allocation

* HCI: heavy and chemical industries

- Increased Production Cost
- Weakened Export Competitiveness

Interventionist financial policies, but fiscal soundness consistently maintained since the early 1980s
Increased Corporate Failure

Heavy Corporate Debt Leverage

Labor Market Rigidity

South East Asian Crisis

Increased Corporate Failure

Deteriorated Financial Soundness

Continued Government Intervention

• Massive capital outflow
• Denied rollover of short-term external debt

IMF Rescue Package

- Excessive expansion strategy, government intervention \(\Rightarrow\) weak financial system
- Worsening international competitiveness \(\Rightarrow\) chronic trade deficit

Reform and Restructuring

Establishing market disciplines

Financial sector restructuring

Corporate sector restructuring

Labor market restructuring

Public sector restructuring and fiscal support

Market Opening and FDI

Expanding social safety net

"Financial crisis offered a good opportunity to redesign the macroeconomic regime and to redefine the role of government"
Swift Crisis Resolution and Economic Recovery

- Successful implementation
  - Cleaning up Nonperforming Loans
  - Expanding Social Safety Net
  - Reducing Moral Hazard
  - Improving Corporate Governance
  - Accelerating Liberalization

Results

1. Early Graduation from the IMF Program
   - Foreign Reserves of more than $100bn

2. Rapid Economic Recovery
   - GDP Growth: 1998 -6.7% → 1999 10.7%

3. Social Stability with Productive Welfare System

Transition to a Knowledge Economy

Vision and Policy Framework

Empowering industries through technology
- Tapping on the potential of ICT
- Nurturing NTBF
- New industrial policy “Cluster approach”

Enhancing productivity through innovation
- Market reform to foster entrepreneurship
- Education/innovation system → “Quality rather than quantity”
- Paving the way to information society

Technology-push
- Innovation-driven

Transition to a knowledge economy
Education and HRD System

- Sequential educational expansion
  - Shifting investment emphasis from primary, secondary to tertiary
- Mobilizing private sectors to fund education
  - Korean family’s high valuation of education
- Investment in HRD pays off over the long run

**Education Spending as a Percentage of GDP (2002)**

![Chart showing education spending as a percentage of GDP for various countries.](chart1.png)

**Share of School Enrollment: Private vs National (2004)**

![Chart showing the share of school enrollment by private and national sectors for different educational levels.](chart2.png)
Case: Education tax

- The 1980 July education reform necessitated substantial increase in the government’s investment in education
  - Education tax was introduced in 1981

- Levied on
  - capital gains income (5%)
  - liquor sales (10%)
  - tobacco sales (10%)
  - banking and insurance companies’ earnings (0.5%)
  - automobile tax (30%)

- More than 20 percent of the education budget was appropriated through the education tax until 2000.

Trend of Korea’s R&D Investment

- Market competition is the prime driver for innovation
  - Korean firms should compete in the world markets

- Human resource is the key for learning
  - The interaction between education and innovation systems

- Government’s role as facilitator at earlier stages
  - Government’s active role earlier years; business took the lead later

- Catch-up: assimilating foreign tech w/ indigenous efforts
  - The Effective use of technologies both domestic and abroad
Trend of Korea’s R&D Investment

Now Korea is among top countries investing in R&D.
Building Technological Capabilities

- The interplay of foreign technologies and indigenous R&D

![Graph showing the relationship between Royalty payment/BERD, % and BERD/Sales, % over time from 1976 to 2002.]

Case: What happened in 1982?

- R&D Investment Share: Government ½, Business ½
- Business began to establish in-house R&D centers

Government

- TECH: Launch of First NRDP (National R&D Program)
  - Government’s technology development program
- Revision of Technology Development Promotion Act (1981)
  - Legal basis of NRDP
- MONEY: Government’s direct financial support for business R&D centers
- Revision of Military Service Law
  - Special army service exemption for qualified engineers and researchers

Business
✓ Stepwise planning with strategic investment
  • The case of informatization promotion fund
✓ Government-business partnership is the key for success
  • The case of CDMA: Risk-sharing enables leapfrogging

ICT density in South Korea (1975-2003)
Building Information Infrastructures

- Broadband Subscribers per 100 Inhabitants (2004)

<table>
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<tr>
<th>Plan</th>
<th>Period</th>
<th>Vision and Policy Goal</th>
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<tr>
<td>Basic Informatization Promotion Plan</td>
<td>1996-2000</td>
<td>Attain world-class informatization levels by 2010</td>
</tr>
<tr>
<td>Cyber Korea 21</td>
<td>1999-2002</td>
<td>Build a leading knowledge-based society</td>
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<tr>
<td>e-Korea Vision 2007</td>
<td>2002-2007</td>
<td>Build e-Korea as the global leader</td>
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</table>

Pragmatic and strategic approach

- “Names” and “Contents” have changed a la stages
- Focus on priority areas with higher impacts
Case: Informatization Promotion Fund (IPF)

- Large scale investment over long run is difficult to carry out with government’s general budget
- IPF to overcome budgetary constraints and to realize vision
  - Instrumental to pave the way to the information society
  - Government-business partnership
    - Co-funding to use priority projects to strengthen industry as a whole

**Sources**

- Private firms 46%
- Gov't budget 40%
- Others 14%

**Usages**

- ICT R&D 37.5%
- Provision and diffusion 20%
- Standardization 2.6%
- Broadband infrastructure 15.1%
- ICT HRD 17.8%
- ICT industry 7%

Total USD 7.78 billion '93-'02

Case: CDMA Technology

- A new technology with high risk and uncertainty
  - Not sure to be a world standard when Korea firstly adopted in 1996
  - CDMA grows to take 14% of world mobile telephony in 2005
- Government risk sharing to support R&D and market creation
  - Government-ETRI-Korean Large Firms ↔ Qualcomm

- World’s first commercialization
- Creation of a new industry
- Growth of related industries

- World market leader
- Price (cost) advantage
- Varied products/services

Enables to broaden technologies such as GSM

Enables to enter foreign markets including Asia, US, Europe and LAC

* CDMA = code division multiple access; GSM = global system for mobile communication
Korea has achieved high growth through the partnership between government and business.

Old strategy had limitations; delayed reform brought the financial crisis.

Crisis offered an opportunity to make economy-wide reform and restructuring.

Transition to a knowledge economy was the vision and strategy.

The process is continuing and rolling over as new challenges are coming.

### Summary

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<th>Development goals</th>
<th>Major policy directions</th>
<th>Macroeconomic policy framework</th>
<th>Human resource development</th>
<th>Science and technology</th>
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</thead>
<tbody>
<tr>
<td><strong>1960s</strong></td>
<td>• Build a production base for exports</td>
<td>• Expand light industries</td>
<td>• Decrease illiteracy</td>
<td>• Build legal basis &amp; administrative frameworks</td>
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<td></td>
<td>• Expand a self-reliant growth base</td>
<td>• Build SOC</td>
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<tr>
<td></td>
<td>• Build a self-reliant growth base</td>
<td>• Promote HCI</td>
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<td></td>
<td>• Expand tech-intensive industries</td>
<td>• Build ICT infrastructures</td>
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<tr>
<td><strong>1970s</strong></td>
<td>• Expand tech-intensive industries</td>
<td>• Industrial rationalization</td>
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<td></td>
<td>• Expand trade liberalization</td>
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<td>• Expand trade liberalization</td>
<td>• Macroeconomic stabilization</td>
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<td></td>
<td>• Expand trade liberalization</td>
<td>• Private autonomy and competition</td>
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<td><strong>1980s</strong></td>
<td>• Enhancing productivity through innovation</td>
<td>• Develop lifelong learning systems</td>
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<td></td>
<td>• Enhancing productivity through innovation</td>
<td>• Frontier research and innovation clusters</td>
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Policy Lessons

- Market intervention but promoting entrepreneurship
- Maintaining fiscal soundness: Instrumental for reforms
- Long-term perspective with gradualism and pragmatism
- Political leadership: Shared vision for nation-building

Korea in the 21st century

- The end of high-input, high growth regime;
- There exists sizable gap in productivity
Are we living in a different world?

❖ Debate on welfare and growth
  - High growth with better income distribution in the past;
  - Low growth seems accompanied with worsening effect.

Are we Koreans living in a different world?

❖ Differences and similarities
  - Technical change is skill-biased also in Korea
  - KE Framework offers a perspective on future challenges
Challenge 1: Institutional Gap

- **Rigidity of Employment**
  - Source: World Bank

- **Annual Work Loss**
  - Source: ILO

- **Corporate Governance**
  - Source: Asian Corporate Governance Association

- **Transparency Index**
  - Source: Transparency International

Challenge 2: Accumulation Gap

- Despite, still relatively, high investment
- Sizable gap in capital stock, (which explains PRD gap)

- **[Capital-labor ratio]**
  - Source: OECD STAN DB
Challenge 3: Quality Gap in HR and Education

- Over-educated Korean?
- Despite high investment, the return seems low

IMD ranking of 60 nations

Education system meets the needs of a competitive economy
University education meets the needs of a competitive economy

Challenge 4: Technology Gap

- R&D input becomes comparable to peers
- Still sizable gap in innovativeness

[Triadic patent families per million population]
Challenge 5: ICT Dilemma

- Divergence between ICT and non-ICT, LE and SME, exporting and domestic oriented
- Employment effect is low, will be lowered
- “De-coupling” of ICT sector and domestic economy

**ICT Industry's Share of GDP**

**Structure of ICT Industries**

What will be the new model?

**Old model**
- Input-driven growth
- Low welfare spending
- Expanding inputs
- Building institutions
- Developmental state

**New model?**
- Regaining growth dynamism
- Virtuous interaction
- Enhancing welfare
- Upgrading qualities
- Changing institutions
- New role for government
“Nothing is ready-made; everything is to be made.”

(Hilary Putnam’s foreword to Nelson Goodman, *Fact, Fiction and Forecast*, 1959)

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**Appendix: Outward-looking Development Strategy (1/3)**

**Economic Conditions of the early 1960s**

- Capital Shortage
- Weak Technology Base
- Underdeveloped Private Sector

- Abundant Labor
- High Level of Education
- Strong Economic will
Appendix: Outward-looking Development Strategy (2/3)

**Working Mechanism**

- Foreign Capital Inducement (Economic Aids/External Debt)
- Capital Good Imports
- Raw Material Imports
- Foreign Technology Imports
- Reproduction
- Manufacturing Processing
- Export Promotion
- Private Enterprises
- Financial Support
- Tax Support
- Well-educated Labor force
- Government
- Technology Development

Strong export promotion supports high growth (Export Growth of 30% per annum)

Appendix: Outward-looking Development Strategy (3/3)

**Entrepreneurship and Government Support**

- Diligent Workers
- Private Enterprises
- Strong Entrepreneurship
- Overseas Marketing and Economic Growth
- Efficient Economic Policy making
- Financial Support
- Tax Support
- Marketing Support
- Strong export promotion supports high growth (Export Growth of 30% per annum)
- Economic Policy Design
- Government Think-tank
- Economic Ministries
- Office of the President
- E P B