Korea's Leading Think Tank

# **Chaebol and Industrial Policy in Korea**

**Wonhyuk Lim** 





#### I. Introduction

Three Externalities and Breakthroughs: Innovation, Coordination, and Governance Historical Growth Experience: Stagnation, Divergence, and Convergence? Capabilities, Learning, and Ownership: Overcoming the Middle Income Trap Value Chain and Product Space: Diversification, Sophistication, and Connection Diverging Views on Industrial Policy

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# Part-01 Introduction



### Conceptual Framework for Development: Innovation, Coordination, and Governance Externalities

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#### Development: Three Externalities

- Development is conceptualized as the result of synergies between enhanced human capital and new knowledge, involving complementary investments in physical and social capital.
- The fundamental policy challenge is for the state to work with non-state actors and markets to address innovation and coordination externalities as well as governance externalities (e.g., incompetence and corruption).

#### "Modern Growth": Three Breakthroughs

- Emergence of a large group of people who absorb and assimilate knowledge to improve their human capital and in turn use their improved human capital to apply and generate knowledge to raise productivity (Lucas 2009)
- Expansion of markets and hierarchies to facilitate specialization and coordinate productive activities, through the invisible hand (Smith 1776) and the visible hand (Chandler 1977)
- Emergence of meritocracy (careers open to talent) and responsive and accountable governance (popular will and checks & balances)

### **Alternative Development Paradigms**



#### Endowment Perspective: Framework Approach (Liberalization)

- Economies with "appropriate endowments" (cultural values, institutions, "investment climate") grow. Those lacking such endowments do not.
  - Examples: Protestant ethic, common law, and colonial legacies
- The state should focus on getting the institutional framework right and then get out of the way. Release market forces and let individuals play the game.

#### **Bootstrapping Perspective: Ingredients Approach (Capacity Development)**

- Initiating growth does not require state-of-the-art institutions. The challenge is not so much to get growth to start by adopting big-bang reforms, as it is to <u>sustain</u> it by devising search networks to detect and mitigate constraints as they emerge.
- The state should facilitate growth by supplying the missing ingredients, which are often characterized by externalities. Retain ownership and progressively develop local capacity.
- The reinforcement of successful experiments through the feedback mechanism of performancebased rewards can lead to dramatic changes over time.
- While a regime that facilitates resource mobilization can be effective in a catch-up phase of development, an institutional platform that fosters autonomy, diversity, and experiment is critical to sustained productivity-led growth.
- \* Note: Differences in the two development paradigms largely reflect differences in assumptions about the relative magnitudes of innovation and coordination externalities on the one hand and negative governance externalities on the other.

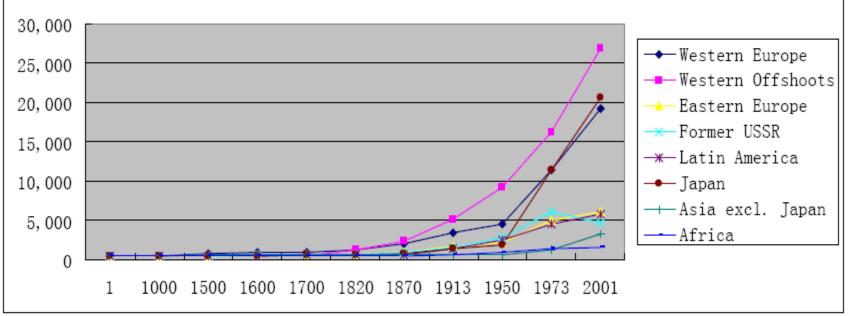
### Historical Growth Experience: Stagnation, Divergence, and Convergence?



• Until the Industrial Revolution, the world's per capita GDP grew at an annual average of 0.05%, which meant that per capita GDP would double every 1,400 years. The world was stuck in low income.

• Starting with the Industrial Revolution, the average annual growth rate of per capita GDP in Western Europe and its offshoots increased to 1% in the 19<sup>th</sup> century and 2% in the 20<sup>th</sup> century.

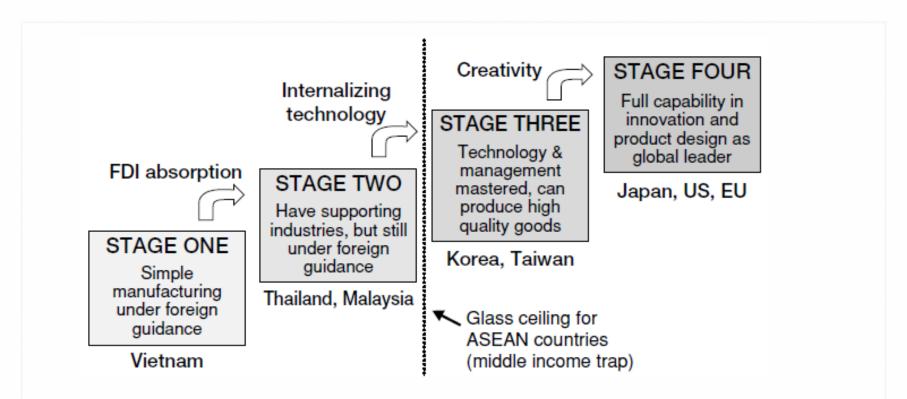
• Japan and several other latecomers have managed to reduce the income gap with the West, but most developing countries have failed to do so.



Per Capita GDP of Various Regions (in 1990 international Geary-Khamis dollars)

Source: Maddison (2006: 642)

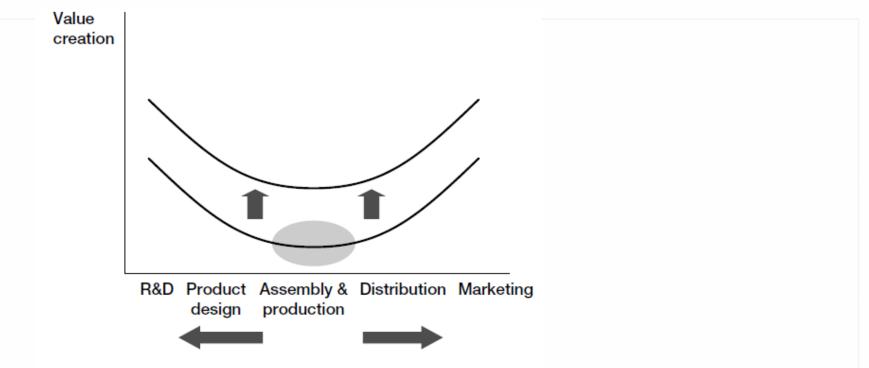
### Capabilities, Learning, and Ownership: Overcoming the Middle Income Trap



Source: Ohno (2009: 8)

Basic education, health, and stability are important for growth and vice versa. Integration into a regional or international production network can bring in much needed investment and know-how. However, to generate high and sustained growth, a country must retain ownership of its development and progressively build up its capacity to add value and manage risks even as it engages in external interaction to narrow the knowledge gap.

## Value Chain: Moving along and Shifting up

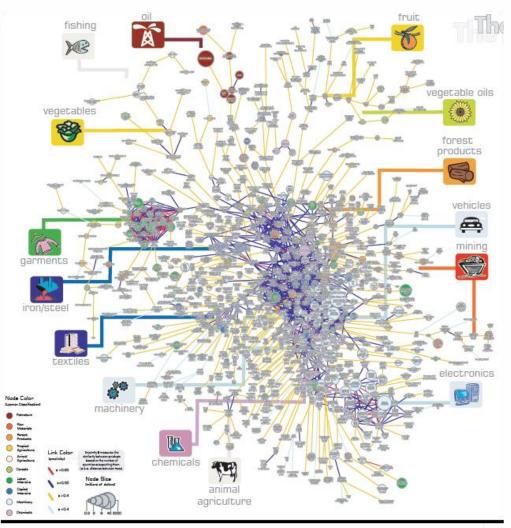


Source: Economic Planning Unit of the Prime Minister's Department, Malaysia (edited).

Developing countries typically start their industrialization in the assembly & production segment of the value chain, using their comparative advantage in labor-intensive manufacturing (e.g., garments). Only a few manage to move to higher value-added segments along the value chain (e.g., R&D and marketing) as well as shift up to higher value-added sectors (e.g., machinery & equipment). Close consultation between the government and the private sector is key to solving information and incentive problems in this stage, when countries try to upgrade their comparative advantage.

# Product Space: Diversification, Sophistication (Upgrading), and Connection (Deepening)

- Product space can be arranged like a forest:
  - A sparse periphery where products connect poorly with others
  - A dense core where products are produced with capabilities used in other products as well
- Development involves producing new things
  - Countries tend to move through the product space by developing goods they currently produce
  - Countries can move from the periphery to the core "<u>only by traversing empirically</u> <u>infrequent distances</u>"



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Source: Hidalgo, Klinger, Barabasi, and Hausmann (2007)

### **Industrial Policy: Literature Review**



Schools	Insights on sector identification and promotion		
Developmental state (Johnson 1982; Amsden 1989; Wade 1990)	Government picks winners (in consultation with business).		
Rent-seeking (Krueger 1974)	Government can't and shouldn't pick winners. (Self-fulfilling incompetence and corruption?)		
Self-discovery (Rodrik 2007)	Winners pick themselves, with help from search and problem-solving networks.		
New structural economics (Lin and Monga 2010)	Latecomers can pick winners in <u>mature</u> industries by benchmarking early movers (based on CA).		
Product space (Hidalgo et al. 2007)	Winners are readily identifiable, but how do we go from the periphery to the core?		
Strategic risk-taking	Winners are readily identifiable, but the key is to take strategic risks, weighing the challenges of skill accumulation, scale economies, and complementary investments against the possibility of capacity underutilization and financial distress.		



### Outward-Oriented, Bottom-up, Integrated Industrial Policy

- Discover latent and potential comparative advantage through experimentation and international benchmarking.
- Positively reinforce successful experiments and phase out unsuccessful experiments by providing performance-based rewards.
- Systematically study what has to be done to fill the missing links in the domestic value chain and move up the quality ladder, and make concerted efforts to aim for international competitiveness from the outset.
- Take strategic risks, weighing the challenges of skill accumulation, scale economies, and complementary investments against the possibility of capacity underutilization and financial distress.

### Inward-Oriented, Top-down, Ad Hoc Industrial Policy

- Promote upstream industries with large spillovers ("Big Push" through coordinated domestic industrialization).
- Go top-down. Disregard feedback.
- Problem: Insufficient Demand, Suboptimal-Scale Plants, Higher Costs, Monumental Projects

Korea retained the ownership of its export-oriented industrialization and progressively developed its own capabilities to add value and manage risks even as it actively learned from, and engaged with, the outside world.

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# Part-02 Korea's Experience with Industrial Policy



### Resource Endowment and Institutional Infrastructure: Historical Hindsight SWOT Analysis for the 1950s

- Egalitarian and Cohesive Society: Implications for HRD
  - Cultural and Ethnic Homogeneity
  - Land Reform and War

#### Abundance of Cheap Educated Labor: Latent Comparative Advantage

- High Level of Education Relative to Income: Equivalent to Education Level in Countries with 2 or 3 Times Korea's Per-Capita Income
- Primary Enrollment Rate: from under 30% (pre-1945) to 95% (1959)
- High-School Enrollment Rate: from 3% (1951) to 20 % (1959)

#### Market Economy with Structural Distortions

- Birth and Growth of Businesses
- Entry Barriers and Import Restrictions

#### • Lack of Capital

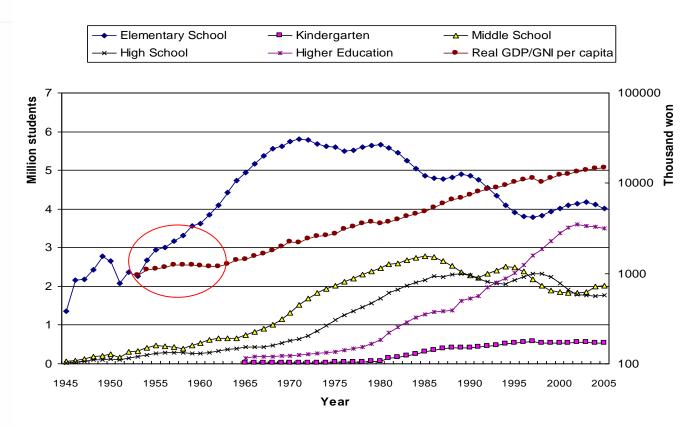
- Low Domestic Savings
- Limited Access to FDI and Foreign Loans

#### Rapidly Expanding and Integrating Non-Communist Market

#### Geopolitical Uncertainty

- Communist Threat
- Korea as "Too Important to Fail" during the Cold War?

## Human Resource Development: School Enrollment and Per Capita Income



Source: Center for Education Statistic Information (http://cesi.kedi.re.kr)

Korea invested in its people even when it was quite poor. Prior land reform, war, and flattening of the traditional hierarchy created expectations for social mobility conducive to human resource development. Universal primary education greatly increased the number of enrolled students at all levels, but did not raise per capita income until complementary developments in industrial and trade policy took place.

### Korea's Big-Push Partnership: Government and Business Groups



### • Two-Tier Approach to Coordination and Innovation

- Government: National-Level Coordination and Innovation
- Chaebol: Group-Level Coordination and Innovation
- Big-Push Partnership: Information and Risk Sharing

### International Trade as an Essential Component

- Coordination
- Scale Economies: Overcoming the Limits of Domestic Market
- Market Test and Reward Based on Performance in a Competitive Setting: Less Prone to Political Influence and Manipulation
- Learning by Exporting: Upgrading Mechanism

### Containment of Corruption and Rent-Seeking

- Changes in Political Economy (1960-61)
- Meritocracy, Monitoring, and Incentives

### Export-Oriented Industrialization: Secure Economic and Political Independence



#### **Centralization and Coordination of Economic Policymaking**

- Establishment of the Economic Planning Board (EPB): Policy Coordination and Budgetary Powers with a Multi-Year Horizon
- Five-Year Plans and Monthly Meetings: Blueprint, Implementation, and Feedback
- Nationalization of Commercial Banks

#### Adjustment of Macroeconomic Variables

- Devaluation of the Korean Currency (KRW/USD: 130  $\longrightarrow$  255 in 1964)
- Adjustment of the Interest Rates ( $15\% \longrightarrow 30\%$  in 1965)

#### **Reinforcement of Experiments through Performance-Based Rewards**

- Support Contingent on Performance in Competitive Markets (L/C-Based Financing)
- State Guarantee to Foreign Financial Institutions on Private-Sector Debt
  - This state guarantee became effective <u>after</u> Korea established a track record of earning hard currency through exports and paying back foreign loans.
  - The state guarantee was extended to foreign financial institutions providing loans to Korean firms, not to their owner-managers, but subsequent developments blurred this distinction.

### Heavy and Chemical Industry Drive: Increase Local Value-Added and Establish Defense Industry



	1972	1976	1981
GNP per capita	\$302	\$488	\$983
HCI Share in Manufacturing Value-Added	35.2%	41.8%	51.0%
HCI Share in Manufacturing Exports	27.0%	44.0%	60.5%

Targets: \$10 billion in exports and \$1,000 in per capita income by 1981

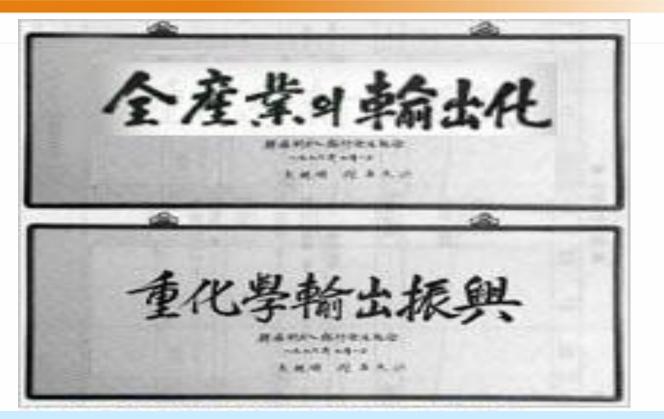
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	Foreign Capital	Domestic Capital	Total	Percent Share
Iron and Steel	1,502	674	2,176	22.7
Non-Ferrous Metals	222	123	345	3.6
Machinery	1,049	1,137	2,186	22.8
Shipbuilding	416	352	768	8.0
Electronics	593	599	1,192	12.4
Chemicals	1,523	662	2,158	22.8
Sub-Total	5,305	3,547	8,852	92.3
Others	468	273	741	7.7
Total	5,773	3,820	9,593	100.0

Source: HCI Promotion Planning Board, cited in K. Kim (1988).

Instead of setting up armories or factories for specific weapons, Korea established dual-use industrial complexes, with a target production ratio of 70 percent civilian and 30 percent military in peacetime.

## "Exportization of All Industries" "Heavy and Chemical Export Promotion"





For Korea, export development-- for which the nation continuously has had to measure itself against global benchmarks-- has been the engine of growth and the organizing principle under which industrial upgrading, infrastructure development, and human resource development could be pursued. Korea promoted heavy and chemical industries with a view toward securing international competitiveness from the outset; they were not just for domestic demand.

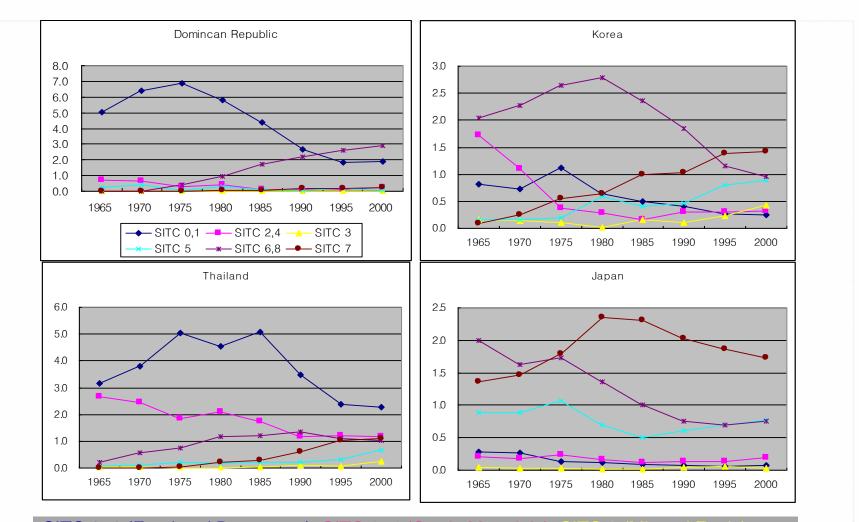
## "Scientification of All People" "Flag-Bearer for the Nation's Modernization"



Question circa 1970: "To raise the share of the domestic value-added in exports and stay ahead of late-developing countries, Korea must upgrade its industries, but do the Korean people have the right national character to succeed in sophisticated industries?"

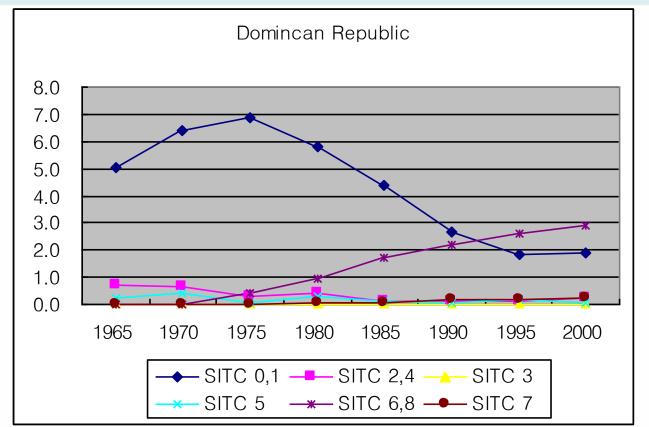
Policymakers had initial doubts, but these young students showed the answer was positive.

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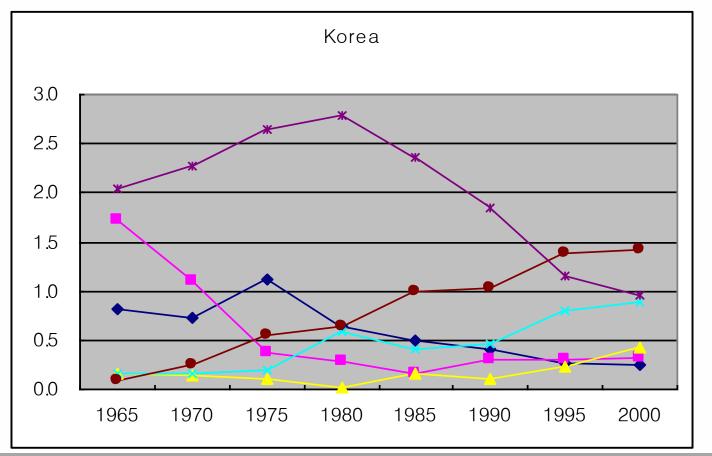
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The Dominican Republic had a large and increasing comparative advantage in sugar in the early 1970s, when its per capita GDP was on par with Korea's. Its garment exports began to take off in the 1980s thanks to free trade zones, but the domestic value-added was limited.



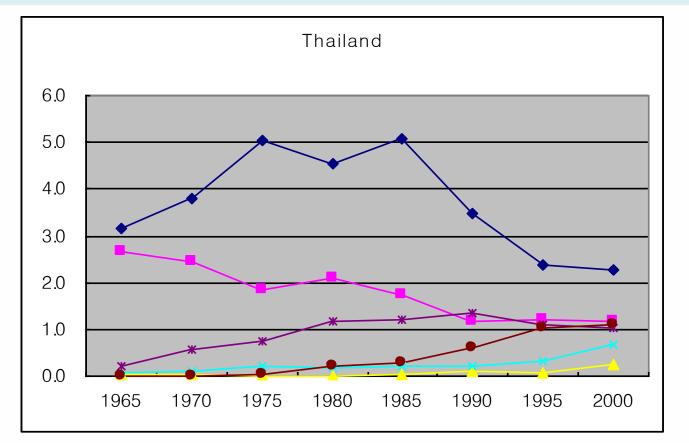
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Korea had a strong *and* increasing comparative advantage in light industries when it made its strategic gamble to promote heavy and chemical industries in 1973, after benchmarking advanced industrial nations with similar natural endowments as Korea's.



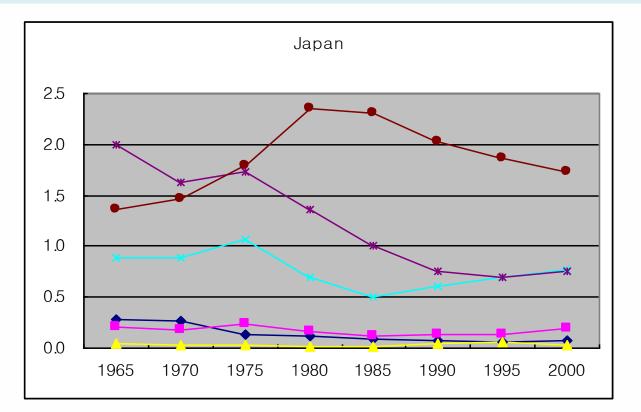
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Thailand had a strong comparative advantage in rice and other raw materials in the early 1970s. It subsequently developed the garment and electronics industries, taking part in the regional division of labor in Asia.



SITC 0, 1 (Food and Beverages), SITC 2, 4 (Crude Materials), SITC 3 (Mineral Fuels), SITC 5 (Chemicals), SITC 6, 8 (Manufactures), SITC 7 (Machinery and Equipment)

Japan had a significant but declining comparative advantage in light industries in the early 1970s. It upgraded its comparative advantage in sophisticated industries with high value-added.



SITC 0, 1 (Food and Beverages), SITC 2, 4 (Crude Materials), SITC 3 (Mineral Fuels) SITC 5 (Chemicals), SITC 6, 8 (Manufactures), SITC 7 (Machinery and Equipment)

### IT Industry Promotion: Forge Ahead in New General-Purpose Technology



Institutional Architecture for IT Promotion after the HCI Drive

- Targeting IT: Reserved EPB, HCI-Focused MCI, and Weak MPC
- Office of the Presidential Secretary for Science and Technology
- Corporatization of the Korea Telecommunication Authority (from MPC)

#### Public-Private Consultation and Value Chain Expansion

- Deregulation: TV and Telephone Sets
- Demand Creation through Procurement: National Backbone Information System
- Collaborative R&D: TDX, Semiconductors, and Computers

#### Outward-Oriented, Bottom-up, Integrated Approach

- Focus on International Competitiveness
- (Absorptive) Capacity Development, Technology Licensing, and Innovation
- Merit-Based Appointments and Performance-Based Rewards

## Diversification into High Value-Added Areas: LG Story



-My father and I started a cosmetic cream factory in the late 1940s.

-At the time, not one company could supply us with plastic caps of adequate quality for cream jars, so we had to start a plastics business. Plastic caps alone were not sufficient to run the plastic molding plant, so we added combs, toothbrushes, and soap boxes.

-This plastics business also led us to manufacture electric fan blades and telephone cases, which in turn led us to manufacture electrical and electronic products and telecommunications equipment.

-The plastics business also took us into oil refining, which needed a tanker shipping company.

-The oil refining company alone was paying an insurance premium amounting to more than half the total revenue of the largest insurance company in Korea. Thus, an insurance company was started.

-This natural step-by-step evolution through related businesses resulted in the Lucky-Goldstar (LG) group as we see it today.

The chaebol and state-owned enterprises (SOEs) served as centers of local capacity development and external interaction. They were willing to pursue vertical integration and related diversification on their own, but usually worked in conjunction with government policy when they ventured into unrelated industries.

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## Part-03 Shift to Competition and Corporate Governance Policy



### Problem of Transition: Whether and How to End the Big-Push Partnership



### From Extra-Market Arrangements to Market Mechanism

- Development of economic institutions and increasing viability of market transactions: Erosion of the efficiency rationale for business groups
- Pyramiding of business groups: Entrenchment of the families and undue concentration of economic power
- Shifting power balance in favor of business groups: Potential for rentseeking and moral hazard
- Danger of Premature Adjustment: Any remaining efficiency advantages?

### From a Developmental State to a Market Economy

- Credible Signal for a Regime Change: How to end "Too Big to Fail"
- Liberalization and Democratization
  - Removal of Entry Barriers vs. Exit Barriers
  - Money Politics vs. Civil Society
- Explosive Combination
  - Strong Expectations for Government Protection Against Bankruptcies
  - Weakening of Government Control

## Partial Reform and Asymmetric Liberalization

### Partial Reform

- Monopoly Regulation and Fair Trade Act (MRFTA) of 1980
- Industrial Development Law of 1986: Horizontal Industrial Policy
- Continued Government Control of "Privatized" Banks
- Interest Rate Liberalization

### Asymmetric Liberalization

- Rise of Non-Bank Financial Institutions (NBFIs) under Chaebol Control
- Widening Gap Between Ownership and Control
- De-Control without De-Protection
- Deregulation > Prudential Regulation
- Capital Account Liberalization

### **Post-Crisis Reform**



### Resolution of Legacy Costs

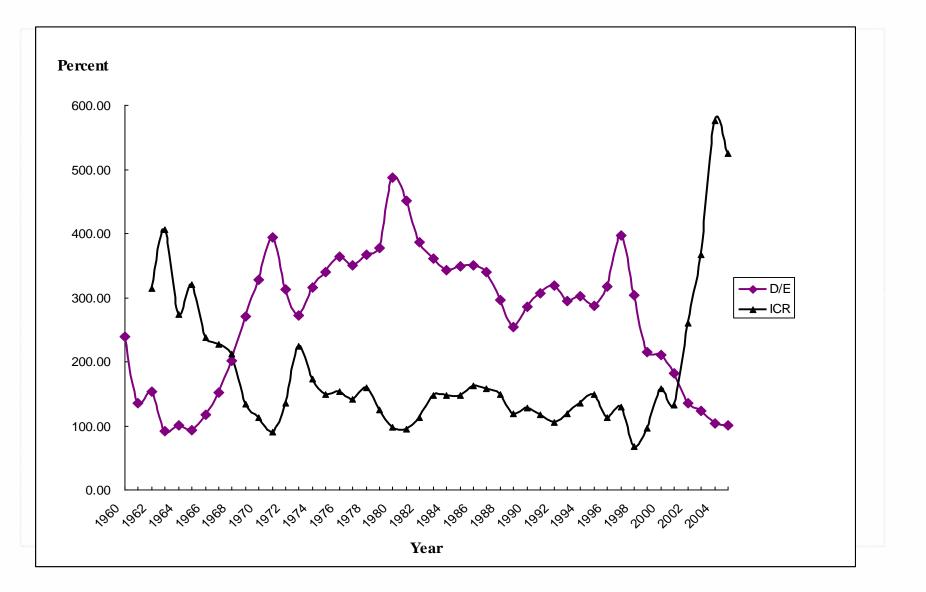
- Injection of public funds to clean up non-performing loans
- Pursuit of accountability for fraud and incompetence

### Structural Reform

- Enhancing prudential regulation
- Reducing moral hazard: massive corporate failures as credible signals
- Strengthening competition: FDI and FTC
- Improving corporate governance
- Enhancing labor market flexibility and social safety net



### **Korea's Experiences with Financial Crises**



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# Part-04 **Conclusion**



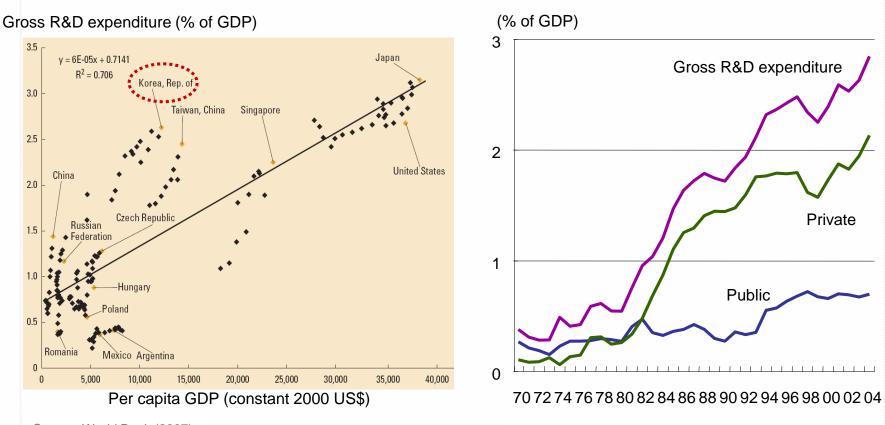
# Korea's Transition Toward a Knowledge Economy KDI

Korea's transition toward a knowledge economy was intimately linked to export promotion, industrial upgrading, and human resource development, and institutionbuilding was largely complete by the end of the 1980s.

	1960s	1970s	1980s	1990s	2000s
Development Stage	Factor-Driven	Investment-Driven		Innovation-Driven	
Industrial Policy	Support Export Development	Promote Heavy and Chemical Industries	Shift from Industry Targeting to R&D Support	Provide Information Infrastructure and R&D Support	Promote New Engines of Growth and Upgrade R&D
S&T Policy	- MOST/KIST - S&T Promotion Act - Five-Year Economic Plan Including S&T	<ul> <li>Government Research Institutes</li> <li>Technical and Vocation Schools</li> <li>R&amp;D Promotion Act</li> <li>Daedeok Science Town</li> </ul>	- National R&D Plan - Private Sector Initiatives in R&D	- Informatization - E-Government - GRI Restructuring - U-I-G Linkages	- Universities' Leading Role - Efficient NIS - RIS and Innovation Clusters

## Korea's R&D Expenditure Trends





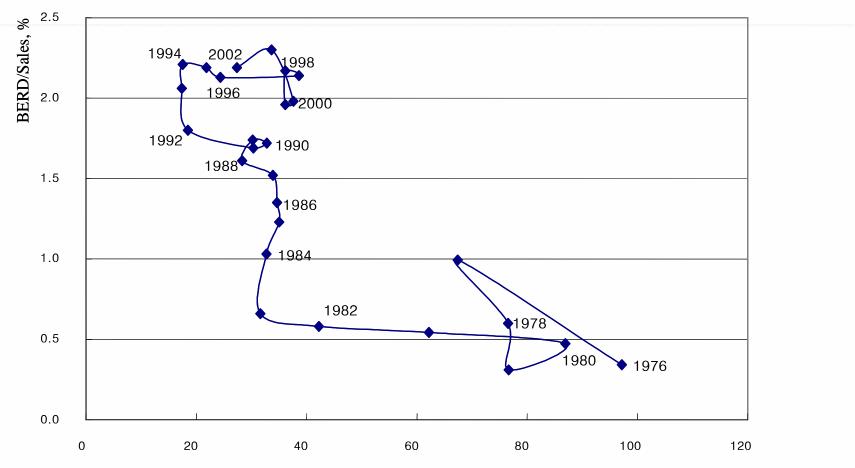
Source: World Bank (2007).

Source: Ministry of Science and Technology, Bank of Korea

Exposed to global competition, private-sector companies came to realize that innovation was key to their prosperity and dramatically increased their R&D expenditures.

### **Business Expenditures on R&D:** From Assimilation to Innovation

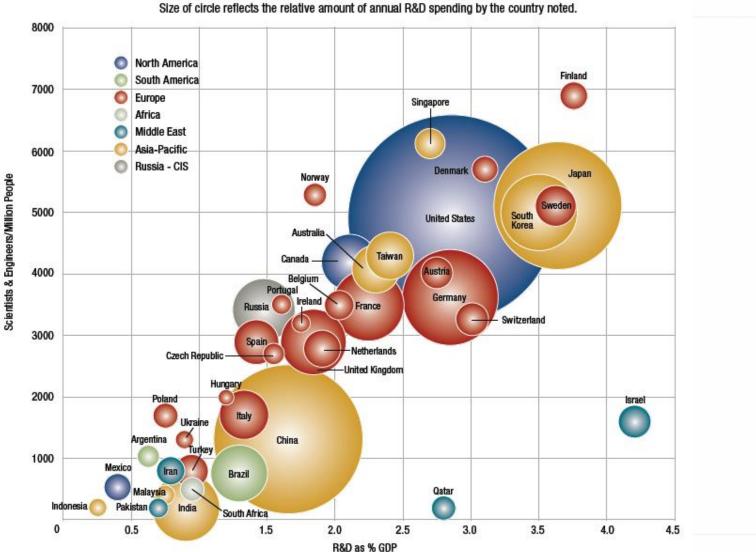




Royalty payment/BERD, %

Not only did Korean firms increase BERD as a share of sales, but they also increasingly conducted their own R&D instead of just relying on technology licensing. As a result, royalty payment as a share of BERD tended to decrease over time.

# **Global R&D Landscape in 2010**



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KDI

Source: Battelle, R&D Magazine, International Monetary Fund, World Bank, CIA World Factbook, OECD

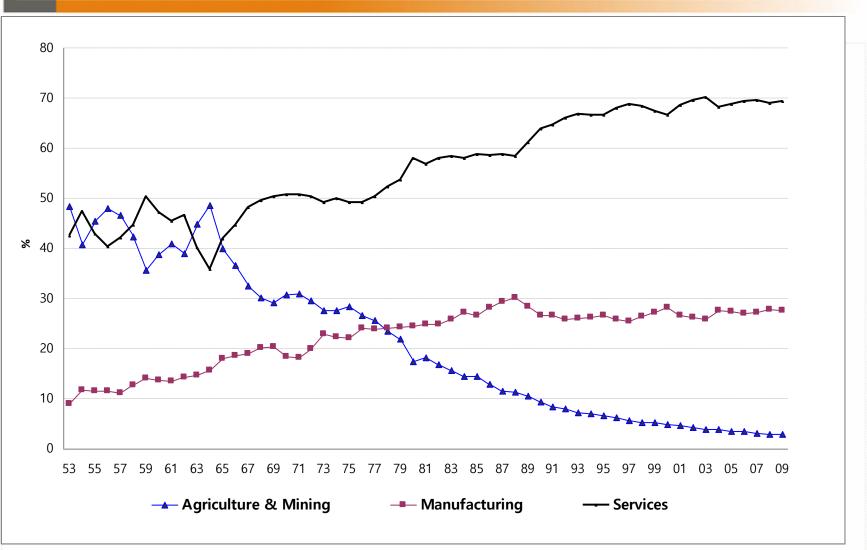
### Korea's Top 10 Exports:

### **Evidence on Industrial Upgrading**



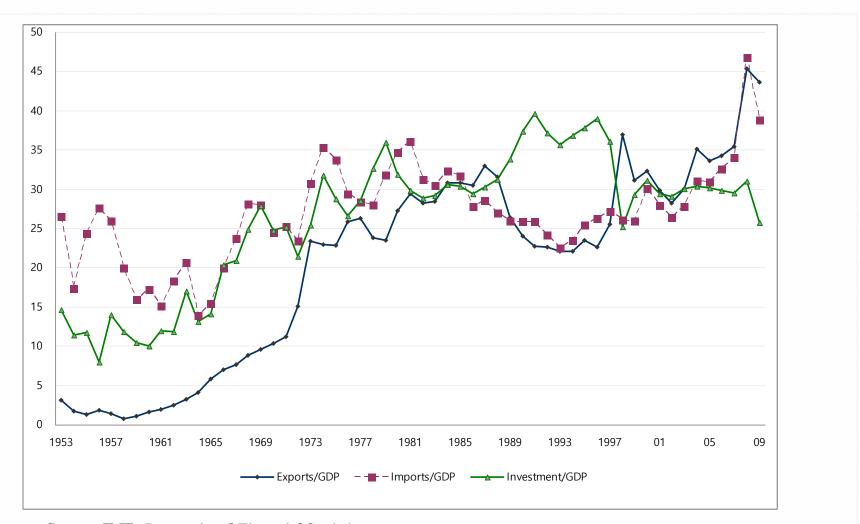
	1960	1970	1980	1990	2000	2010
1	Iron Ore	Textiles	Textiles	Electronics	Semiconductors	Semiconductors
2	Tungsten Ore	Plywood	Electronics	Textiles	Computers	Ships
3	Raw Silk	Wigs	Iron and Steel Products	Footwear	Automobiles	Phones
4	Anthracite	Iron Ore	Footwear	Iron and Steel Products	Petroleum Products	Petroleum Products
5	Cuttlefish	Electronics	Ships	Ships	Ships	Automobiles
6	Live Fish	Fruits and Vegetables	Synthetic Fibers	Automobiles	Wireless Telecommunication Equipment	Liquid Crystal Devices
7	Natural Graphite	Footwear	Metal Products	Chemicals	Synthetic Resins	Auto Parts and Components
8	Plywood	Tobacco	Plywood	General Machines	Iron and Steel Products	Plastic Products
9	Rice	Iron and Steel Products	Fish	Plastic Products	Textiles	Org. & Inorg. Compounds
10	Bristles	Metal Products	Electrical Goods	Containers	Video Devices	Electronic Appliances

### **Sectoral Composition of Korea's GDP**



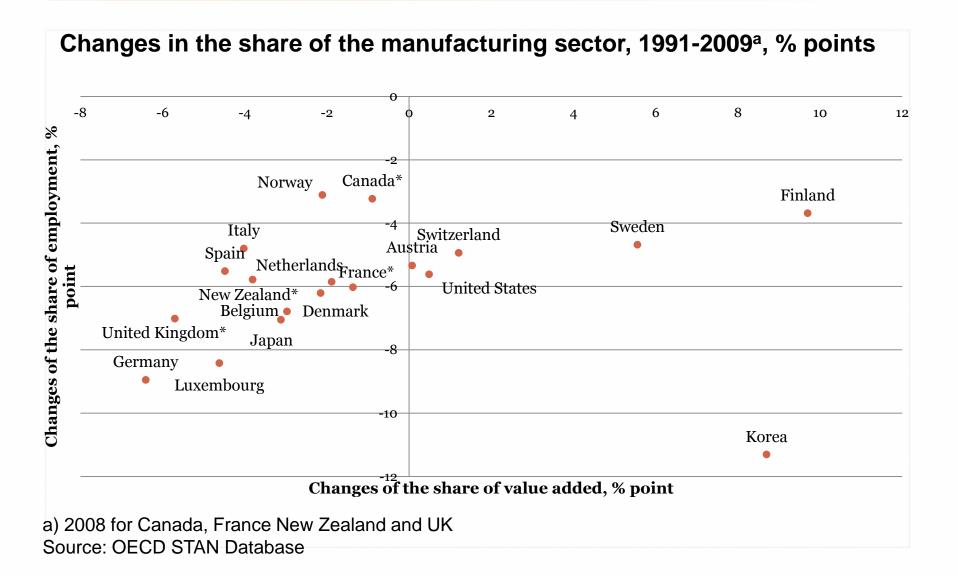
Source: Bank of Korea, National Account (http://ecos.bok.or.kr).

# Korea's Exports, Imports, and Investment Relative to GDP

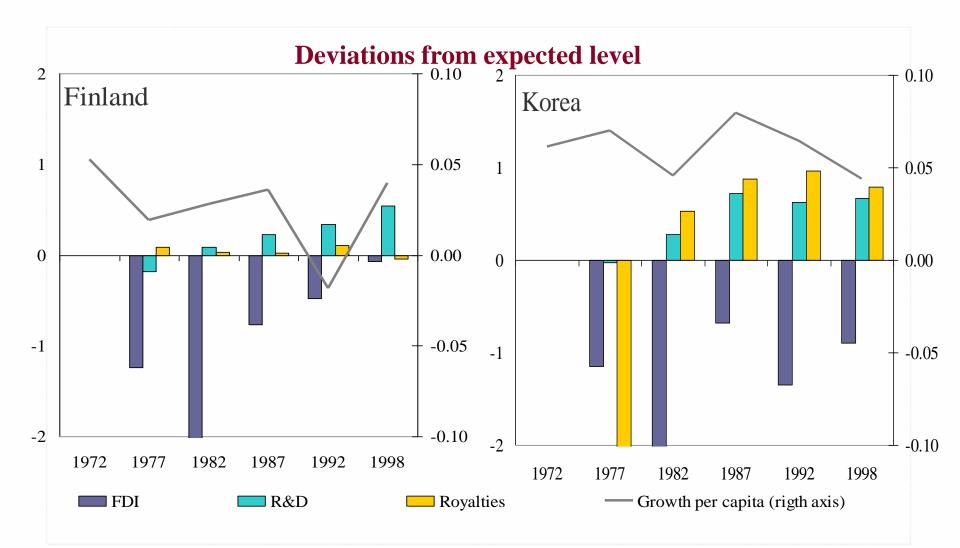


Source: IMF, International Financial Statistics. Bank of Korea, National Account (http://ecos.bok.or.kr).

### Any More Room for Manufacturing Structural Transformation?: Value Added and Employment



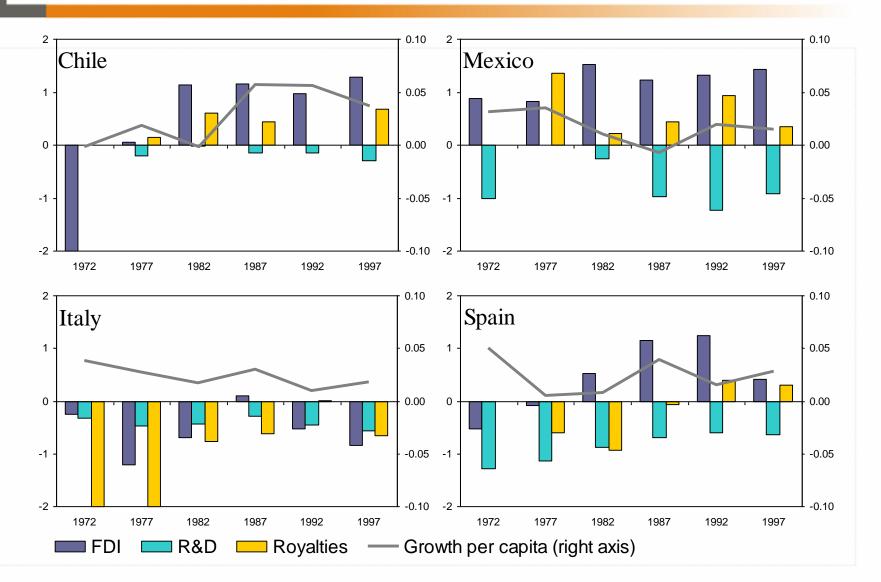
# The Superstar model: Low FDI, high R&D, high royalty payments



Source: Maloney (2004)

### "Latin" model: high FDI, low R&D, moderate royalty payments





Source: Maloney (2004)

### **Future Policy Challenges**



### Policy Approaches to Business Groups

- Latin America: Rent-Seeking by business and political elites
- Sweden: Grand Bargain between social democrats and business groups
- U.S. and Britain: Anti-Pyramiding through inter-corporate dividend taxes and strict takeover rules

### **Korean Characteristics**

- Chaebol, exposed to global competition, as "dancing elephants"
- Negative environment for innovative start-ups and open innovation

### Korean Approach

- Outward-oriented, bottom-up, integrated policy
- Strengthening investor protections against "tunneling" and other abuses
- Improving innovation ecosystem by strengthening intellectual protection, competition, and access to finance