Chaebol and Industrial Policy in Korea

Wonhyuk Lim
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Part-01 Introduction
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 sustain 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 performance-based 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 19th century and 2% in the 20th 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)
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.
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 “only by traversing empirically infrequent distances”

Source: Hidalgo, Klinger, Barabasi, and Hausmann (2007)
## Industrial Policy: Literature Review

<table>
<thead>
<tr>
<th>Schools</th>
<th>Insights on sector identification and promotion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental state</td>
<td>Government picks winners (in consultation with business).</td>
</tr>
<tr>
<td>(Johnson 1982; Amsden 1989; Wade 1990)</td>
<td></td>
</tr>
<tr>
<td>Rent-seeking</td>
<td>Government can’t and shouldn’t pick winners. (Self-fulfilling incompetence and corruption?)</td>
</tr>
<tr>
<td>(Krueger 1974)</td>
<td></td>
</tr>
<tr>
<td>Self-discovery</td>
<td>Winners pick themselves, with help from search and problem-solving networks.</td>
</tr>
<tr>
<td>(Rodrik 2007)</td>
<td></td>
</tr>
<tr>
<td>New structural economics</td>
<td>Latecomers can pick winners in mature industries by benchmarking early movers (based on CA).</td>
</tr>
<tr>
<td>(Lin and Monga 2010)</td>
<td></td>
</tr>
<tr>
<td>Product space</td>
<td>Winners are readily identifiable, but how do we go from the periphery to the core?</td>
</tr>
<tr>
<td>(Hidalgo et al. 2007)</td>
<td></td>
</tr>
<tr>
<td>Strategic risk-taking</td>
<td>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.</td>
</tr>
</tbody>
</table>


Industrial Policy Approaches

- **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.
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?
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 → 255 in 1964)
  - Adjustment of the Interest Rates (15% → 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 after 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

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<thead>
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<th></th>
<th>1972</th>
<th>1976</th>
<th>1981</th>
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<tbody>
<tr>
<td>GNP per capita</td>
<td>$302</td>
<td>$488</td>
<td>$983</td>
</tr>
<tr>
<td>HCI Share in Manufacturing Value-Added</td>
<td>35.2%</td>
<td>41.8%</td>
<td>51.0%</td>
</tr>
<tr>
<td>HCI Share in Manufacturing Exports</td>
<td>27.0%</td>
<td>44.0%</td>
<td>60.5%</td>
</tr>
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targets: $10 billion in exports and $1,000 in per capita income by 1981

<table>
<thead>
<tr>
<th></th>
<th>Foreign Capital</th>
<th>Domestic Capital</th>
<th>Total</th>
<th>Percent Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron and Steel</td>
<td>1,502</td>
<td>674</td>
<td>2,176</td>
<td>22.7</td>
</tr>
<tr>
<td>Non-Ferrous Metals</td>
<td>222</td>
<td>123</td>
<td>345</td>
<td>3.6</td>
</tr>
<tr>
<td>Machinery</td>
<td>1,049</td>
<td>1,137</td>
<td>2,186</td>
<td>22.8</td>
</tr>
<tr>
<td>Shipbuilding</td>
<td>416</td>
<td>352</td>
<td>768</td>
<td>8.0</td>
</tr>
<tr>
<td>Electronics</td>
<td>593</td>
<td>599</td>
<td>1,192</td>
<td>12.4</td>
</tr>
<tr>
<td>Chemicals</td>
<td>1,523</td>
<td>662</td>
<td>2,158</td>
<td>22.8</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>5,305</td>
<td>3,547</td>
<td>8,852</td>
<td>92.3</td>
</tr>
<tr>
<td>Others</td>
<td>468</td>
<td>273</td>
<td>741</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>5,773</td>
<td>3,820</td>
<td>9,593</td>
<td>100.0</td>
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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.
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.
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.
Revealed Comparative Advantage: CA-Conforming or CA-Defying or Something More?

**Dominican Republic**

- 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)

**Korea**

**Thailand**

**Japan**

- CA - Conforming or CA - Defying or Something More?
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.
Korea had a strong \textit{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.
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.
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
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.
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 rent-seeking 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

The graph shows the trend of D/E and ICR (debt-to-equity ratio and interest coverage ratio) over the years from 1960 to 2004. The D/E ratio fluctuates significantly, with a notable peak around 2004. The ICR, represented by the black line, also shows variability, particularly in the later years, indicating potential financial stress or challenges. The graph suggests that financial crises were frequent and significant during this period.
Korea’s transition toward a knowledge economy was intimately linked to export promotion, industrial upgrading, and human resource development, and institution-building was largely complete by the end of the 1980s.

<table>
<thead>
<tr>
<th>Development Stage</th>
<th>Industrial Policy</th>
<th>S&amp;T Policy</th>
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<tbody>
<tr>
<td><strong>1960s</strong></td>
<td>Support Export Development</td>
<td>- MOST/KIST</td>
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<tr>
<td>Factor-Driven</td>
<td></td>
<td>- S&amp;T Promotion Act</td>
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<tr>
<td></td>
<td></td>
<td>- Five-Year Economic Plan Including S&amp;T</td>
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<tr>
<td><strong>1970s</strong></td>
<td>Promote Heavy and Chemical Industries</td>
<td>- Government Research Institutes</td>
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<tr>
<td>Investment-Driven</td>
<td></td>
<td>- Technical and Vocation Schools</td>
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<tr>
<td></td>
<td></td>
<td>- R&amp;D Promotion Act</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Daedeok Science Town</td>
</tr>
<tr>
<td><strong>1980s</strong></td>
<td>Shift from Industry Targeting to R&amp;D Support</td>
<td>- National R&amp;D Plan</td>
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<tr>
<td>Innovation-Driven</td>
<td></td>
<td>- Private Sector Initiatives in R&amp;D</td>
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<tr>
<td></td>
<td>Provide Information Infrastructure and R&amp;D Support</td>
<td>- Informatization</td>
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<tr>
<td></td>
<td></td>
<td>- GRI Restructuring</td>
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<tr>
<td></td>
<td></td>
<td>- U-I-G Linkages</td>
</tr>
<tr>
<td><strong>1990s</strong></td>
<td>Promote New Engines of Growth and Upgrade R&amp;D</td>
<td>- Universities’ Leading Role</td>
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<td></td>
<td></td>
<td>- Efficient NIS</td>
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<td></td>
<td></td>
<td>- RIS and Innovation Clusters</td>
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Exposed to global competition, private-sector companies came to realize that innovation was key to their prosperity and dramatically increased their R&D expenditures.
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

Size of circle reflects the relative amount of annual R&D spending by the country noted.

Source: Battelle, R&D Magazine, International Monetary Fund, World Bank, CIA World Factbook, OECD
### Korea’s Top 10 Exports:
#### Evidence on Industrial Upgrading

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<tr>
<td>1</td>
<td>Iron Ore</td>
<td>Textiles</td>
<td>Textiles</td>
<td>Electronics</td>
<td>Semiconductors</td>
<td>Semiconductors</td>
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<td>2</td>
<td>Tungsten Ore</td>
<td>Plywood</td>
<td>Electronics</td>
<td>Textiles</td>
<td>Computers</td>
<td>Ships</td>
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<td>3</td>
<td>Raw Silk</td>
<td>Wigs</td>
<td>Iron and Steel Products</td>
<td>Footwear</td>
<td>Automobiles</td>
<td>Phones</td>
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<tr>
<td>4</td>
<td>Anthracite</td>
<td>Iron Ore</td>
<td>Footwear</td>
<td>Iron and Steel Products</td>
<td>Petroleum Products</td>
<td>Petroleum Products</td>
</tr>
<tr>
<td>5</td>
<td>Cuttlefish</td>
<td>Electronics</td>
<td>Ships</td>
<td>Ships</td>
<td>Ships</td>
<td>Automobiles</td>
</tr>
<tr>
<td>6</td>
<td>Live Fish</td>
<td>Fruits and Vegetables</td>
<td>Synthetic Fibers</td>
<td>Automobiles</td>
<td>Wireless Telecommunication Equipment</td>
<td>Liquid Crystal Devices</td>
</tr>
<tr>
<td>7</td>
<td>Natural Graphite</td>
<td>Footwear</td>
<td>Metal Products</td>
<td>Chemicals</td>
<td>Synthetic Resins</td>
<td>Auto Parts and Components</td>
</tr>
<tr>
<td>8</td>
<td>Plywood</td>
<td>Tobacco</td>
<td>Plywood</td>
<td>General Machines</td>
<td>Iron and Steel Products</td>
<td>Plastic Products</td>
</tr>
<tr>
<td>9</td>
<td>Rice</td>
<td>Iron and Steel Products</td>
<td>Fish</td>
<td>Plastic Products</td>
<td>Textiles</td>
<td>Org. &amp; Inorg. Compounds</td>
</tr>
<tr>
<td>10</td>
<td>Bristles</td>
<td>Metal Products</td>
<td>Electrical Goods</td>
<td>Containers</td>
<td>Video Devices</td>
<td>Electronic Appliances</td>
</tr>
</tbody>
</table>
Sectoral Composition of Korea’s GDP

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

Agriculture & Mining
Manufacturing
Services
Korea’s Exports, Imports, and Investment Relative to GDP

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

Changes in the share of the manufacturing sector, 1991-2009\textsuperscript{a}, \% points

![Graph showing changes in the share of the manufacturing sector.](image)

-8 -6 -4 -2 0 2 4 6 8 10 12

Changes of the share of employment, \% point

Changes of the share of value added, \% point

a) 2008 for Canada, France New Zealand and UK
Source: OECD STAN Database
The Superstar model: Low FDI, high R&D, high royalty payments

Deviations from expected level

“Latin” model: high FDI, low R&D, moderate royalty payments

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