The Korean Experience on Economic Transformation, Scientific and Technological Changes: Implications to Tanzania’s Industrialization Agenda

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IV. Science, Technology and Innovation
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Location of Korea
I. Overview

(1) Korean: The Country

  - Area: 99,720 sq.km (Compared with 943,000 sq.km of Tanzania)
  - World Rank (2015): 6th Trading country ($963.4bil), % of GDP: 67%
    (Export: $529.9 bil., Import: 436.5 bil.)
    11th largest economy ($1,435.1bil.)
  - GDP per capita: $27,633 (WB, 2016)
  - Human Development Index: 12-15th in recent years

- Economic Indicators:
  - GDP share: Agri.; 2.6%, Industry; 39.2%, Services; 58.2%
  - Labour share: Agri.; 4.9%, Industry; 17.8%, Services; 77.3%(2012)
  - Growth rate: 2.8%(2016), 2.6%(2015), 3.5%(2014)
  - Main industries: Shipbuilding, Automobile, Petrochemical, Electronics, ICT, Semiconductors, etc.
I. Overview

(2) Historical Review

- Kingdom over 1700 years: Chosun Dynasty over 500 years till 1910
- 1909: Japanese occupation
- 1945: Liberation from the Japanese occupation
- 1950-53: The Korean War
- 1960s: Industrial Promotion; Outward looking
- 1970s: Big push; heavy and chemical industries
- 1980s: Structural adjustment & liberalization, the IT industries
- 1990s: financial crisis in 1997 [IMF Bail out policies($60 bil.), paid back within 3 years; gold collection campaign 225 tons($ 3 bil.).]
- 2017: Still progressing, BUT lower rate of economic growth
## I. Overview

### (3) Trade and the Balance of Payment

#### <Korea’s Annual Trade Growth in 2002–15(US$ billion)>

<table>
<thead>
<tr>
<th>Year</th>
<th>Export</th>
<th>Import</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>172.2</td>
<td>160.5</td>
<td>+11.8</td>
</tr>
<tr>
<td>2004</td>
<td>254.2</td>
<td>224.5</td>
<td>+29.7</td>
</tr>
<tr>
<td>2008</td>
<td>363.5</td>
<td>323.1</td>
<td>+22.0</td>
</tr>
<tr>
<td>2012</td>
<td>547.9</td>
<td>519.6</td>
<td>+28.3</td>
</tr>
<tr>
<td>2014</td>
<td>572.7</td>
<td>525.5</td>
<td>+47.2</td>
</tr>
<tr>
<td>2015</td>
<td>526.9</td>
<td>436.5</td>
<td>+90.4</td>
</tr>
</tbody>
</table>

Source: Korea Statistics Office (2016)

#### <Korea’s 5 Major Export Commodities in 2015(US$ billion)>

<table>
<thead>
<tr>
<th>Year</th>
<th>Electronics goods</th>
<th>Automobile</th>
<th>Computers and Machinery</th>
<th>Chemical products</th>
<th>Shipbuilding</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>93.0</td>
<td>71.3</td>
<td>61.4</td>
<td>32.0</td>
<td>40.2</td>
</tr>
<tr>
<td>2014</td>
<td>138.2</td>
<td>73.3</td>
<td>63.0</td>
<td>52.4</td>
<td>46.7</td>
</tr>
<tr>
<td>2010</td>
<td>110.8</td>
<td>53.4</td>
<td>52.0</td>
<td>32.6</td>
<td>38.3</td>
</tr>
</tbody>
</table>

Source: Korea Statistics Office (2016)
II. Economic Development

(1) Economic Transformation (Agri. → Industrial)

Source: MOSF, 2009

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II. Economic Development

(2) Korea: Flow Chart of Industrial Strategies

- Foreign Capital Inducement (External Debt)
- Import of Capital Goods
- Imports of Raw Materials
- Borrow Technologies from Abroad
- Economic Promotion
- Reproduction
- Industrialization
- Private Enterprises
- Government
- Financial • Tax Incentives
- Well-educated Labor Force
- Technology Development

Source: MOSF, 2009
II. Economic Development

(3) Transform Industries (Low Tech. - High Tech.)

1960s
- Light Industries
  - Import protection
  - Foster export-oriented light industry

1970s
- Heavy Industries
  - Introduce new technology, expand technological capability

1980s
- Assembly & Processing Industries
  - Import liberalization
  - Invest in technologies, training of skilled manpower

1990s
- IT Industry
  - Strengthen demand-driven technological innovation
  - Establishment of nationwide IT infrastructure

2000s
- New Industries
  - Creative industries, innovation
  - Korean culture
  - Innovation centers and cities
II. Economic Development

(4) Korea: 1960s Outward-looking industrialization

- Before 1960, a traditional society: agriculture based (WW Rostow)
- Strong government in 1961: Late President Park Chung Hee
- Top priorities: Eliminate poverty and industrial promotion
- Began 5-year economic development plan in 1962
- Outward-looking economic policies; export-oriented
  - Korea had abundant cheap labor, few natural resources, a small size of domestic market
  - Promotion of exports: government subsidies and incentives
  - Light industries: low level technology, maximize job creation
- The government determined target industries for promotion: export and domestic markets
- Provision of capital for target industries
  - Introduction of foreign capital; Shopping list on hands; Government guarantee; Keeping the ownership
  - Soft loans for target industries: operating twist
II. Economic Development

(5) Korea: 1960s-Policies and Education

- Pre-conditions for take-off
- Establishment of special purpose financial institutions
  - Korea Development Bank, Korea Export and Import Bank,
    SME Bank, Agricultural Bank, Korea Foreign Exchange Bank, etc.
  - Government control over the financial sector
- Human Resource Development:
  - Higher education; priorities on subjects such as engineering,
    science and technology; textile, chemical, computer, architecture,
    mechanical, shipbuilding, electronics, electrical engineering, etc.
  - Top students go on law and medicine; economics and management
  - Secondary education: technical high schools and TVET
- Provision of social overhead capital
  - Conducive business environment
II. Economic Development

(6) Korea: 1970s-Big Push for HCIs

- Take-off (large investment; both infrastructure and manufacturing)
- To promote the Heavy and Chemical Industries from the late 1960s
- Linkages between the government and enterprises
  - Target industries were supported
  - Favorable interest rates available for investment
  - Large scale manufactory plants: steel, automobile, shipbuilding, etc.; induced demand for SME products
- Created large conglomerate, Chaebol, and expanded businesses
  - 30 Chaebols share 80% of the Korean GDP in 2012
    (Samsung: 23%, Hyundai: 12%)

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II. Economic Development

(7) Korea: 1970s-Target Industries

- Mobilize Financial Resources (soft loans)
- Government determined target industries
- Many Chaebols were created (preferred large in scale)
- Accelerate competition in the international market (monopoly and oligopoly)

- Iron and steel (SOE)
- Electronics
- Petro-chemical
- Automobile
- Ship-building
- Machineries

- Debate: Only selected industries were supported and neglecting SMEs; many SMEs are benders (eg. the automobile industry)
- some policies on SMEs; soft loans etc.
- Iron& steel industry: basic need for industrialization

Source: MOSF, 2009

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II. Economic Development

(8) Korea: 1980s-New Step for Further Development

- Drive to maturity (more competitive in the international market)
- Imbalanced growth: Chaebol, regional imbalance, structural imbalance:
  - “Chaebol problems” Too big to fail
- Over capacities in the HCIs: Chaebols were competing each other; Why not me attitude
- Moved into high tech industries: IT industries like Samsung, LG, Daewoo
  - Big step toward to advanced technologies
  - Risk taking behavior; chairman has power to take action, though top managers were against; that is a positive side of business
- Relaxed labor policies: Trade Union movement was allowed in 1988
  - Increased wage rate: Investment to China and East Asia, now to Africa (market expansion and international division of labour)
- Government created oligopoly by Chaebol: Was it right?
II. Economic Development

(9) Korea: 1990s-2000s; Emergence

- High mass consumption society (the last stage of growth)
- Globalization: WTO, FTAs, and integrated to the world economy
- The Asian Financial Crisis in 1997: Some failed like ‘DAEWOO’ – ’Too big to fail’ (?)
  - Opportunities for the Korean industries to increase competitiveness
- New economy with science and technology progress: IT, BT, NT
- Dynamic and innovative economy: adapt the changes in world business environment
- Science, technology and innovation: required rich in human capital
  - R&D activities: in terms of 4.03% of GDP (2013, 2\textsuperscript{nd} in the world after Israel; 4.15% in 2014)
- E-government system: increased efficiency of the country
  - Possible with the development of the ICT industries

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III. R&D Promotion

(1) R&D Expenditure and R&D/GDP(%)

Source: MSIP (www.msip.go.kr)

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III. R&D Promotion

(2) Public R&D

Public R&D Investment

<table>
<thead>
<tr>
<th>Year</th>
<th>Government’s R&amp;D Budget (Trillion KRW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963</td>
<td>0.002</td>
</tr>
<tr>
<td>1997</td>
<td>3.0</td>
</tr>
<tr>
<td>2013</td>
<td>17.1</td>
</tr>
</tbody>
</table>

Source: MSIP (www.msip.go.kr)

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III. R&D Promotion

(3) Share of Public and Private R&D


Source: MSIP (www.msip.go.kr)
(4) Comparison to Global R&D

Source: Battelle (2011)
III. R&D Promotion

(5) Number of Researchers

Source: MSIP (www.msip.go.kr)
III. R&D Promotion

(6) Major S&T Achievement

Science & Technology Articles

<table>
<thead>
<tr>
<th>Year</th>
<th>Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>4 (53rd)</td>
</tr>
<tr>
<td>1997</td>
<td>7,870 (18th)</td>
</tr>
<tr>
<td>2012</td>
<td>347,066 (10th)</td>
</tr>
</tbody>
</table>

International Patents

<table>
<thead>
<tr>
<th>Year</th>
<th>PCT Applications</th>
<th>US Granted Patents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>10</td>
<td>11,848</td>
</tr>
<tr>
<td>1997</td>
<td>30</td>
<td>13,233</td>
</tr>
<tr>
<td>2012</td>
<td>288</td>
<td></td>
</tr>
</tbody>
</table>

Science & Technology Competitiveness (IMD)

Source: MSIP
III. R&D Promotion

(7) S&T and Alignment with Industries

Light Industries
- Self-Sustain
- Import-Subs.

Heavy Industries
- Mfg. Capacity
- Industrial Seeds

Assembly & Processing Industries
- Open Market

IT Industries
- Higher Value-added

New Growth Engines
- Industrial Diversification

Industry-Oriented STI Strategy
- Import Protection
- Export-Orient
- Import Tech.
- Tech. Capability
- Expand R&D
- Skilled HR
- Demand-oriented Innovation
- Endogenous Tech.
IV. Science, Technology and Innovation

(1) S&T Policies


- 1st 5-Year Economic Plan
- Ministry of S&T (MOST)
- Korea Institute of S&T (KIST)
- Korea Advanced Institute of Science (KAIS)
- Technology Development Promotion Act
- National R&D Program (NRP)
- Industrial Generic Technology Development Program (IGTDP)
- Information and Communication R&D Program (ICRP)
- Highly Advanced National Project (HAN)
- Deputy Prime Minister of MOST (OSTI)
- Financial Crisis
- S&T Leadership

- MEST & MKE
- MSIP
IV. Science, Technology and Innovation

(2) Initiatives of S&T: Strategies

- **Input**: 5% Investment, Reach to 5% of GDP on GERD

- **Process**
  - **R&D**
    1. Key industrial technologies
    2. Emerging industrial technologies
    3. Knowledge-based service technologies
    4. State-led Technologies
    5. National issues-related technologies
    6. Global issues-related technologies
    7. Basic & convergent technologies
  - **System**
    1. World-class human resources
    2. Basic & fundamental research
    3. SMEs’ innovation
    4. S&T globalization
    5. Regional innovation
    6. S&T infrastructure
    7. S&T culture
    * SMEs: Small- and Medium-sized Enterprises

- **Performance**: Become one of 7 major S&T powers in the world
### IV. Science, Technology and Innovation

#### (3) Development of Korean Innovation System

<table>
<thead>
<tr>
<th>Stage</th>
<th>1960s ~ 1970s</th>
<th>1980s</th>
<th>1990s</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Situation</td>
<td>• Inadequacy of university &amp; industry research</td>
<td>• Expansion of industry &amp; univ. research</td>
<td>• Foundation of industry-led system</td>
<td>• Expansion of university research</td>
</tr>
<tr>
<td></td>
<td>• Established GRIs in industry priority</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Control Ministry</td>
<td>• Decentralized by relevant Ministries</td>
<td>• Centralized by the Agency of S&amp;T</td>
<td>• Decentralized by related Ministries</td>
<td>• Centralized by the Office of Premier</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• MOST, MSIF</td>
</tr>
<tr>
<td>Mission</td>
<td>• Support industrial technology</td>
<td>• Support industrial technology</td>
<td>• Perform national R&amp;D programs</td>
<td>• Develop future technology platforms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform national R&amp;D programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research Focus</td>
<td>• Imitation of mature foreign technologies</td>
<td>• Imitation of mature, advanced foreign technologies</td>
<td>• Expansion of public R&amp;D</td>
<td>• Development of growth engine technologies</td>
</tr>
</tbody>
</table>

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IV. Science, Technology and innovation

(4) Korean National Innovation System (KNIS)

- Innovation Policies and Activities
  - The role of the Korean Government in S&T
  - Government Research Institutes (GRIs): applied science
    - KIST, ETRI, KITECH and Others (26 institutions)
  - Universities: SNU, KAIST, POSTECH …: basic science
  - R&D by large companies & SMEs: tax incentives

- Network among Innovation Innovations
  - TIC (Technology Innovation Center)
  - RIC (Regional Innovation Center)
  - Technology Parks

- Industry – University – GRIs Clusters: cooperation
  - Financial support
IV. Science, Technology and innovation

(5) Public Innovation Institutions: progress

- The Government
  - Development of Science & Technology Infrastructure
  - Korea Institute of Science & Technology in 1966 (USAID)
    - Established several GRIs as spin-offs from KIST in 1968
    - Established Korea Advanced Institute of S&T (KAIST) in 1975
  - Direct R&D Support to Universities and GRIs

- GRIs (Government Research Institutions)
  - Important role in industrial R&D in ’60s and ’70s
    - Helped firms to acquire foreign technologies
    - Informally diffused technology thru reverse-engineering
  - Backbone of national R&D since 1982
IV. Science, Technology and innovation

(6) Private Innovation Institutions

Universities
- The rapid expansion of engineering, S&T education
- More teaching-oriented than research-oriented
- Recent emphasis on more basic & applied research
  - Industry-academia cooperation in universities and colleges

Private Sector
- Large firms established corporate R&D centers in the 1980s
  - Samsung, LG, Hyundai and SK group, etc.
- SMEs started R&D activities
- Preferential finance and tax concessions for Industrial R&D
  - Supplied experienced researchers for Industries
- Joint research & development among large firms
### (7) R&D Expenditure and No. of Researchers

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D expenditure (bil. Korean won)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Public</td>
<td>7.2 (73%)</td>
<td>105.5 (50%)</td>
<td>510.8 (16%)</td>
<td>3,816.9 (28%)</td>
<td>12,270.2 (28.0%)</td>
</tr>
<tr>
<td>- Private</td>
<td>1.8 (18%)</td>
<td>102.4 (48%)</td>
<td>2,698.9 (84%)</td>
<td>10,023.4 (72%)</td>
<td>31,489.6 (71.8%)</td>
</tr>
<tr>
<td>- Foreign</td>
<td>0.8 (8%)</td>
<td>3.8 (2%)</td>
<td>0.8 (0%)</td>
<td>8.2 (0%)</td>
<td>95.0 (0.2%)</td>
</tr>
<tr>
<td>Number of researchers</td>
<td>5,337</td>
<td>18,434</td>
<td>70,503</td>
<td>159,973</td>
<td>345,912</td>
</tr>
<tr>
<td>- GRIs</td>
<td>2,413 (45%)</td>
<td>4,598 (25%)</td>
<td>10,434 (15%)</td>
<td>13,913 (9%)</td>
<td>26,235 (7.6%)</td>
</tr>
<tr>
<td>- University</td>
<td>2,142 (40%)</td>
<td>8,695 (47%)</td>
<td>21,332 (30%)</td>
<td>51,727 (32%)</td>
<td>53,270 (15.4%)</td>
</tr>
<tr>
<td>- Private</td>
<td>782 (15%)</td>
<td>5,141 (28%)</td>
<td>38,737 (55%)</td>
<td>94,333 (59%)</td>
<td>266,407 (77%)</td>
</tr>
</tbody>
</table>

- Innovation and S&T contributed sustainable development in Korea.
### IV. Science, Technology and innovation

#### (8) S&T Competitiveness, Patent, & SCI Papers

<table>
<thead>
<tr>
<th>Description</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rank of National Competitiveness 1)</strong></td>
<td>$31^{th}$</td>
<td>$27^{th}$</td>
<td>$23^{th}$</td>
<td>$22^{th}$</td>
<td>$22^{th}$</td>
<td>$22^{th}$</td>
</tr>
<tr>
<td>- Science</td>
<td>$5^{th}$</td>
<td>$3^{rd}$</td>
<td>$4^{th}$</td>
<td>$5^{th}$</td>
<td>$5^{th}$</td>
<td>$7^{th}$</td>
</tr>
<tr>
<td>- Technology</td>
<td>$14^{th}$</td>
<td>$14^{th}$</td>
<td>$18^{th}$</td>
<td>$14^{nd}$</td>
<td>$14^{th}$</td>
<td>$11^{th}$</td>
</tr>
<tr>
<td><strong>Number of Patent Registration 2)</strong></td>
<td>61,115</td>
<td>42,129</td>
<td>51,404</td>
<td>72,258</td>
<td>84,061</td>
<td>n.a.</td>
</tr>
<tr>
<td>- International Patent Application 3)</td>
<td>7,899 ($4^{th}$)</td>
<td>8,035 ($4^{th}$)</td>
<td>9,669 ($5^{th}$)</td>
<td>10,447 ($5^{th}$)</td>
<td>11,847 ($5^{th}$)</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Number of SCI Paper</strong></td>
<td>34,344 ($12^{th}$)</td>
<td>37,730 ($12^{th}$)</td>
<td>41,385 ($11^{th}$)</td>
<td>45,435 ($11^{th}$)</td>
<td>47,066 ($10^{th}$)</td>
<td>n.a.</td>
</tr>
<tr>
<td>- Average Citation Number</td>
<td>3.29 ($30^{th}$)</td>
<td>3.47 ($30^{th}$)</td>
<td>3.86 ($31^{th}$)</td>
<td>4.07 ($30^{th}$)</td>
<td>4.23 ($31^{th}$)</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

1) IMD (International Institute for Management Development)
2) WIPO (World Intellectual Property Organization)
3) PCT (Patent Cooperation Treaty)

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IV. Science, Technology and innovation

(9) S&T Success

- Government-led economic development in 1960~’70s
  - Heavy-Chemical Industries & followed by IT Industry
- Chaebols; well organized management and innovation system
- Human Capital: internationally educated in the U.S., Europe & Japan,
  - Catch-up strategies(USA, Europe, Japan)
- Rapid transformation from imitation to innovate
  - motivation and zeal
- Fusion with Information Technologies for Up-grading
- International environment on engineering and S&T
V. Key Success Factors

(1) Overview

- Endogenous and Exogenous Factors:
  - The Government:
    - Good governance; strong government and developmental state
    - Top people join civil services as the society respects
    - Effective long-term vision and good management
    - Monetary and fiscal policies
    - Role of State-owned Enterprises
  - The Private Sector
    - Entrepreneurship: Risk-taking behavior as government supported
  - Social Infrastructure
    - Education & skills, motivation and self-esteem
    - Confucianism: seniority, scholarly, organizational structure
  - External Factors: USA, Japan (geographical location)
V. Key Success Factors

(2) The Government in the 1950s

- Ministry of Rehabilitation (1955-61)
  - Strong foreign intervention and need for immediate rehabilitation and reconstruction.
  - Ideas of development planning were criticized on account of resource and capacity constraints.
  - The Ministry was entrusted with planning economic stabilization, rehabilitation and reconstruction program.
  - Budget function was carried out by the Ministry of Finance
  - Land reform was completed

- During this period five year plan was prepared by foreign consultant but was not implemented...lack of political support.
  - Economic programs of the ministry lacked long-term development objectives.
  - Fiscal deficit: foreign aid filled the gap
V. Key Success Factors

(3) The Government in the 1960s- after

- The Economic Planning Board (1961-1993)
  - Reorientation of national priorities: political stability and economic development.
- Supreme Council for National Reconstruction was established which exercised legislative, executive and judicial powers and tight control...strong leadership with commitment to modernization and economic development.
- Economic Planning Board (Super Ministry); Deputy Prime Minister
  - Planning, resource mobilization, budgeting, statistics, policy advice and coordination function of economic development council
  - Economic cooperation and technology management) were added.
V. Key Success Factors

(4) The Government: Strong Ministry EPB

- Visionary, strong-willed and innovative political leadership
  - Engineered a futuristic development vision and always looked for quality and excellence.
  - Pragmatic and focused political commitment.
  - Delivered what was promised.

- EPB assumed leadership in strategic planning and implementation
  - High profile office and status
  - Focused but coordinated planning, budgeting, resource mobilization, R&D and national statistics.

- Established a pool of highly motivated and talented policy makers, technocrats and professionals
  - Best people were brought in government bureaucracy and provided with further development opportunities.
  - National R&D capacity developed inviting non-resident Koreans with special package of incentives.
V. Key Success Factors

(5) The Government: Strong Ministry EPB

- Strategic national development framework
  - National identity and pride
  - Strategic planning agency and development plans
  - Consensus building among key stakeholders
  - Centralized economic planning and implementation
- Five year science and technology development plan
- Inter-ministry, thematic or sectoral group meetings
- Emphasis national budget with national development plan.
- The President presided the monthly economic meeting and export promotion meeting (Nov. 30, 1964 Export Day; export exceeded US$ 100 mil.)
V. Key Success Factors

(6) The Government: Harmonization

- The country must be able to maintain stable domestic economy while implementing:
  - Macroeconomic policies that are flexible enough to deal with changes in global economic environment
  - Incentives for private businesses and foreign investors
  - Policies; export diversification to achieve a long-run sustained growth
- Provide conducive business environment
- Education and TVET; business oriented courses, science and technology
- Social infrastructure, health care, welfare, etc.
- Environmental protection
V. Key Success Factors

(7) The Private Sector: Participatory

- The Private Sector
  - government instruction, completely result-oriented treatment, leader-follower model, selected industries
  - Many entrepreneurs were encouraged to do business

- Social factors: Social values on scholars, civil servants, equal opportunity and democratic progress

- External factors: Foreign aid, the war reparations from Japan

- The dispersed ownership also has agency costs but the market for corporate control would discipline the controller (or the management).

- Concentrated ownership => Internalizing costs
V. Key Success Factors

(8) The Private Sector: Absorption

- 1960s: Priorities on economic growth
  - Foreign capital and technology inducement
  - Cheap labor cost; easy to start both domestic and foreign
- 1970s: Sustained high economic growth and moved to more capital intensive industries
  - Subsidy to export industries
  - Middle-East construction boom in the 1970s afterward
  - Large investment in the heavy and chemical Industries
- Building and promotion of prestige projects to engender hope and pride among people often against
  - Seoul-Busan Expressway: SOE
  - POSCO: iron and steel; SOE
  - Promotion of heavy and chemical industries: Private
  - Promotion of defense industries: SOE
  - Self-sufficiency in main staple food i.e. rice.
V. Key Success Factors

(9) The Private Sector: Capacity Building

- “Can Do Spirit”: motivation
- “Confucius Culture”, kinship, social network,
- Capacity building: use of resources especially labour
- Education system
  - Cultural background, Motivation (“A dragon rises from the ditch.”)
  - Engineering, science & technology
- TVET
  - Skills and support program
  - Increasing demand for skilled workers
  - Effective technical and vocational training system
- Entrepreneurship development: how to earn money
  - Collude with the government
  - Crony capitalism
V. Key Success Factors

(10) The Private Sector: Forward Looking

- 1980s: Growth of the Domestic Market
  - Low wage, low exchange rate, low commodity prices
  - Government policy to promote the start-ups of technology based firms
  - Growth of venture capital
  - Matured Chaebol and more critical to the economy

- 1990’s: Development of technology and R&D, matured economy
  - Deregulation: Reduce government intervention
  - Overseas market expansion and FDI
  - Role of Chaebol to the Korean economy became more important
    BUT some failed like DAEWOO, Hanbo, Kia, Jinro, etc.
  - Restructured the manufacturing sector

- 2000s and After:
  - Emergence of new generation with creative ideas
  - Start-ups after involuntary retirement; restructuring and downsizing boom
  - Creative economy: new momentum for sustainable development
V. Implications to Tanzania

(1) Theories Behind

- The Market: Traditional Cobb-Douglas production function
  - Land, Labor, Capital, Enterprise, Technology, and many factors
  - Technological capability through R&D investment
- The Public Sector
  - National security, law and order, the provision of public goods
  - Macroeconomic policies: 4 objectives: economic growth, balance of payment, full employment, low inflation
  - Government expenditure: Conducive business environment
  - Human capital formation: education, health, welfare etc.
  - Diffusion of technology and protection of patent rights
- The Private Sector
  - Good governance and management skills
  - Innovative capacity through entrepreneurship
  - Sustainability of businesses
  - Adaptive capacity of technology and management techniques
VI. Implications to Tanzania

(2) Role of Stake Holders

- The Government:
  - Good governance system; stability and efficiency
  - Visionary policies; Business friendly environment; infant industry argument, catch-up hypothesis
  - Human capital; education and training

- Industry
  - Lead industries with R&D, marketing, and views on global business
  - Utilization of factors of production; resources from the theory
  - Absorptive Capacity: technology, management

- Universities and GRIs
  - Educate top-notch people; opportunities
  - R&D activities: cooperation programs in S&T
VI. Implications to Tanzania

(3) The Government

- National Economic Plan: achievable, practical, scientific, acceptable (bottom up approach)
  - macroeconomic policies
- Sustainable development: inclusive, long-term vision oriented
- Education and training: quality of education, TVET, ordinary citizens
- Engineering, science and technology: for sustainability
- National R&D system: necessary for transformation and innovation
- Build Industry-University-Government Cooperation network
- Good governance (Capacity building)
- Environmental protection; regulations
VI. Implications to Tanzania

(4) The Private Sector

- Build up industrial Capacity; comparative and competitive advantages:
  - Selection of industries
  - Take into account of factor endowment of Tanzania
  - Marketability in domestic and foreign
- Promote entrepreneurship: management skills, confidence
  - Partnership with foreign companies
- Patriotism: self-esteem,
  - Nationalistic but open minded
- Vision and Strategies: forward looking
  - Sustainable business and pursue long-term benefits
- Align with government policies:
- Dissemination of best practices: encourage new business opportunities
VI. Tanzania and Korean Partnership

- Korean ODA to Tanzania is second. The Education sector is the largest.
Q & A

Thank you!