

**Closing the Gap in Innovation:
The Cases of Korea, Taiwan, and Mexico
- *Two Success Models toward Innovation: Korea and Taiwan* -**

Presented at

*2007 Technology Transfer Society (T²S) Conference
“Entrepreneurship and Technology Commercialization”*

*University of California, Riverside Palm Desert Graduate Center
Palm Desert, California
October 25, 2007*

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Panelists

- **Dr. Yongsuk Jang**

- **Korea (South)**

- Senior Research Scientist, Center for International Science and Technology Policy (CISTP), The George Washington University (GWU)

- Ph.D. in Public Policy / Science and Technology Policy Major

- **Dr. Leonardo Ríos Guerrero**

- **Mexico**

- Deputy Director for Innovation, National Council of Science and Technology (CONACYT, Mexico)

- Director for Research and Education of the Mexican Petroleum Institute

- Director of the Center of Applied Innovation for Competitive Technologies (Centro de Innovación Aplicada en Tecnologías Competitivas, CIATEC)

- Ph.D. from the University Claude Bernard-Lyon

- **Dr. Enrique Campos--López**

- **Mexico (Overview)**

- Private Consultant to Mexican Gov't and other Institutes

- Director, Research Center on Applied Chemistry (CIQA)

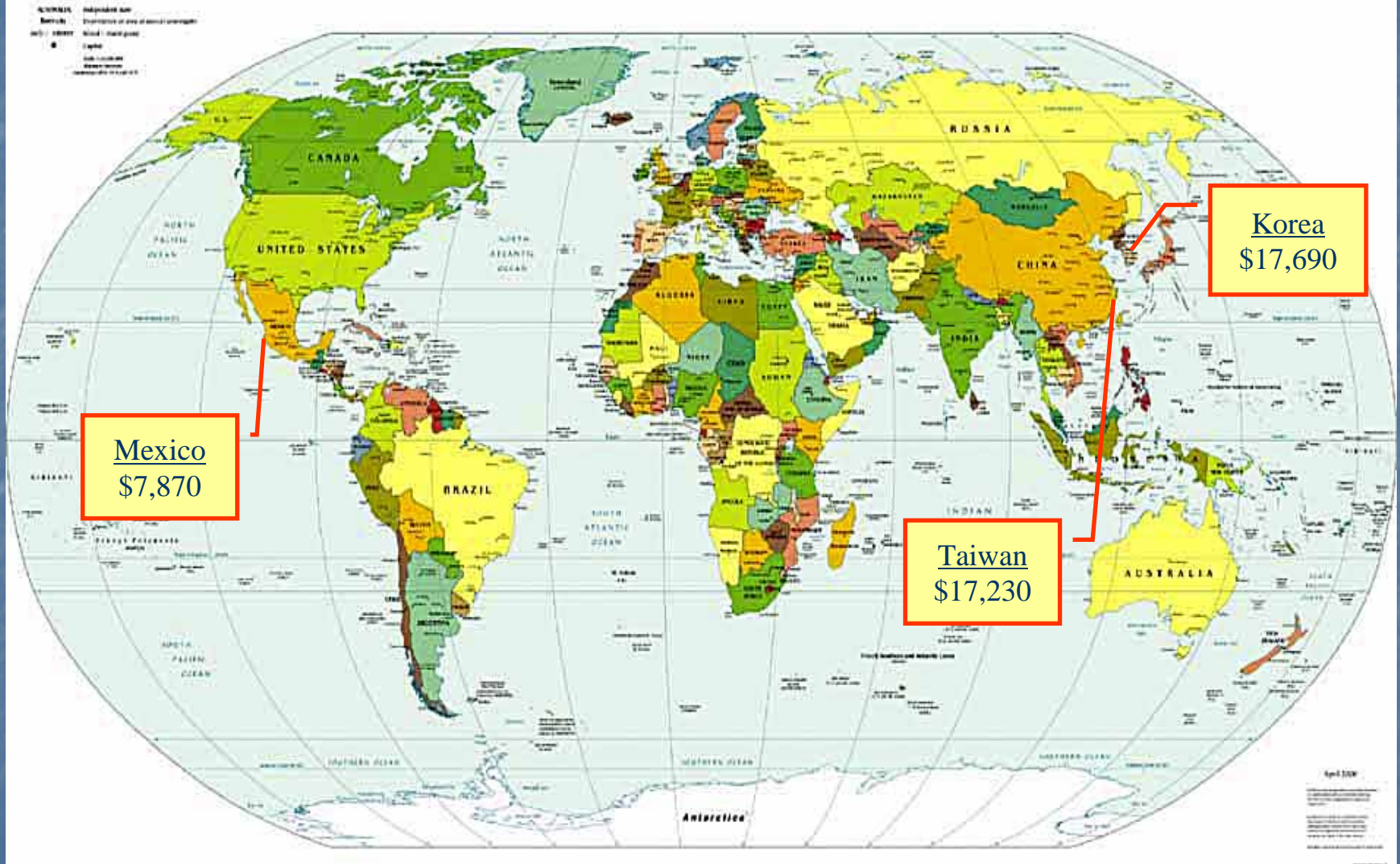
- Professor in Chemistry Dept. of the Universidad Nacional Autónoma de México (UNAM)

- Visiting Scholar at CISTP of GWU



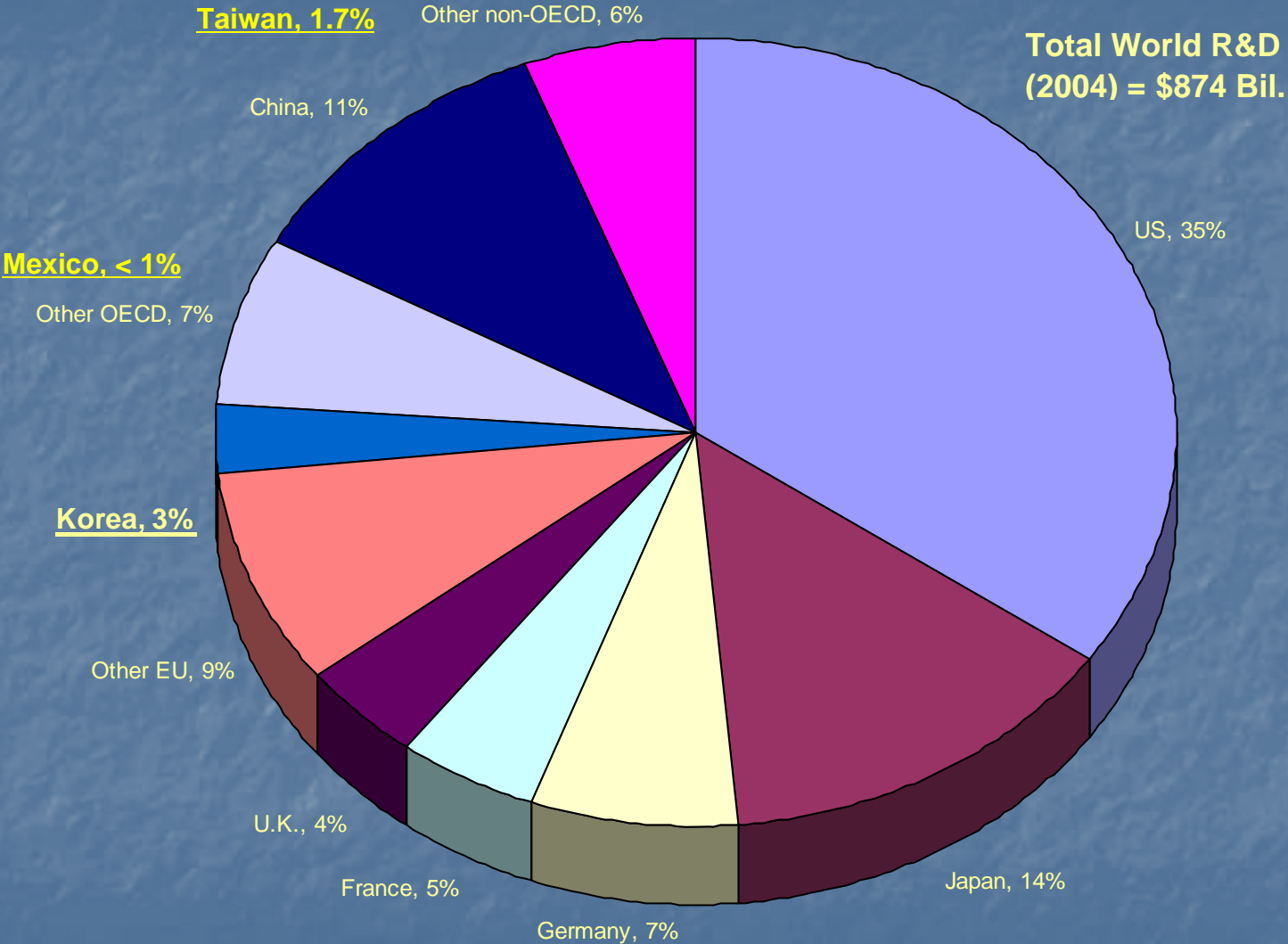
Korea, Taiwan and Mexico

Political Map of the World, April 2000



Source: World Bank (2007), GNI per Capita in 2006

Share of Total World R&D (2004)



Source: AAAS (2006)

Similar Backgrounds

• Korea

- Independent from Japanese Colonial Rule
- Divided into Two
- Difficult External Political Situation - North Korea
- Democratized from Authoritarian, military-backed nationalistic government
- Well Educated People
- Close Economic Ties to Japan and the U.S.
- Start Labor-intensive Economy

• Taiwan

- Independent from Japanese Colonial Rule
- Divided into Two
- Difficult External Political Situation - Main Land China
- Democratized from Authoritarian Corporatist State
- Well Educated People
- Close Economic Ties to Japan and the U.S.
- Start Labor-intensive Economy

Same Development Strategies

• Industrial Development

- Labor-intensive Light Industries (e.g., toys, clothing, footwear, sporting goods)
- Scale-intensive heavy and chemical industries (steel, metals, fertilizers, basic chemicals)
- Assembly-based industries (e.g., motor vehicles, televisions and other consumer durables)
- Innovation-intensive Schumpeterian industries (e.g., aircraft, computers, pharmaceuticals)

• Follower's Strategy for Tech. Development

- First Stage: implementation of imported foreign tech. & dependence on foreign experts
- Second Stage: assimilation of tech.
- Third Stage: improvement of technology & development of local S&T talent
- Fourth Stage: development of an independent innovative capability

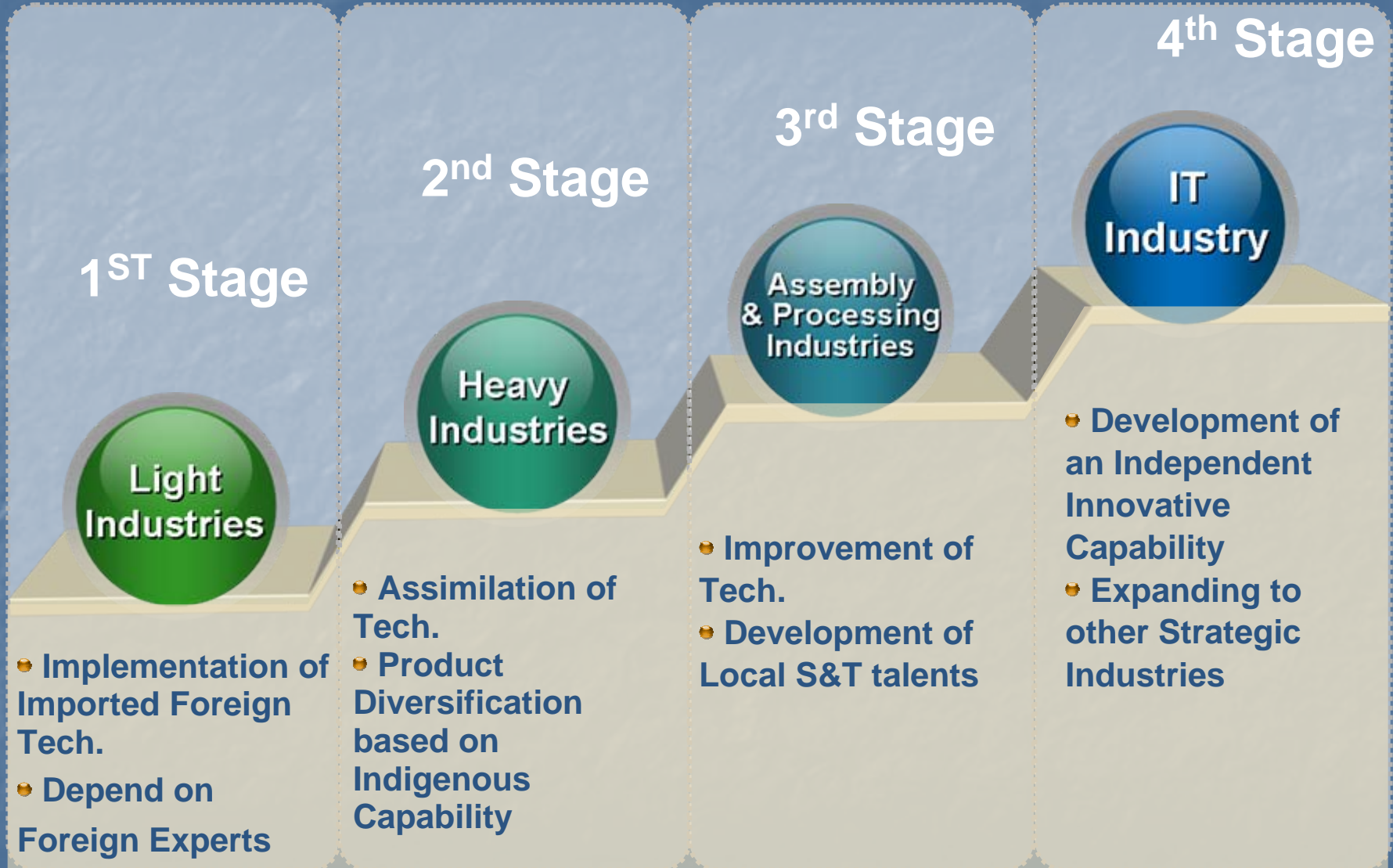
Stages of Korean Development

- **War, reconstruction and land reform (1950 – 60)**
- **Export takeoff (1961 – 73)**
- **Heavy and chemical industries drive (1973 – 79)**
- **Functional incentives and liberalization (1980 – 90)**
- **Financial sector liberalization (1990 –)**

Stages of Taiwanese Development

- **Land reform and reconstruction (1949 – 52)**
- **Import-substituting industrialization (1953 – 57)**
- **Export promoting (1958 – 72)**
- **Industrial consolidation and new export growth (1973 – 80)**
- **High technology and modernization (1981 –)**

Industrial Shifts and S&T Policies



Major Features and Players

• Korea

- Strong Gov. Role
- Economic Planning Board (EPB)
- Ministry of S&T (MOST)
- Ministry of Commerce... (MOCIE)
- Ministry of Information and Communication (MIC)
- KIST & other GRIs
- Weak University Research
- Daeduk Science Park
- *Chaebols*

• Taiwan

- Relatively weaker but Fundamental Gov. Role
- The Executive Yuan
- Council for Economic Planning and Development (CEPD)
- Industrial Technology Research Institute (ITRI)
- Weak University Research
- Hsinchu Science-based Park
- *Quanxichiye*

Different Industrial Structure

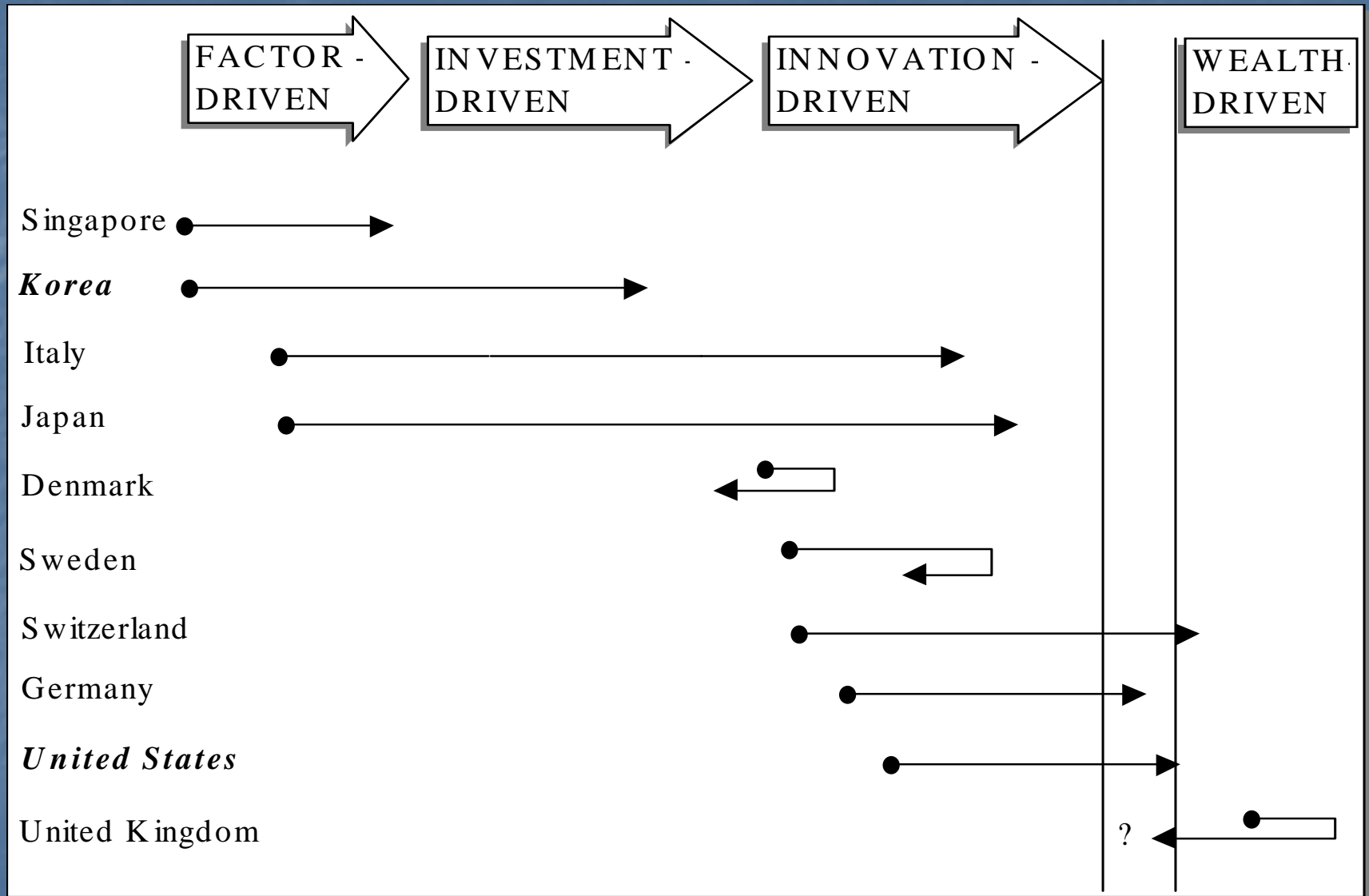
• Korea - *Chaebols*

- Small number of extremely large and highly diversified business groups
- Family-controlled
- Locomotives for rapid economic development
- Self-sustaining in producing final products and services
- Able to make large (mega-) investment
- Competing globally
- Not efficient mechanism for Tech. diffusion
- Vulnerable to external crisis (e.g., Asian financial crisis)

• Taiwan - *Guanxichiye*

- Business groups of related SMEs
- Supplying intermediate products and services to other businesses
- Few exceptions in EE industries
- Family-owned
- Subcontracting to minimize investment, skill, and burden
- Entrepreneurial climate
- Highly internationalized
- Quick adaptation to external crisis
- Modular architecture

Estimated Evolution of National Competitive Development



Source: Michael E. Porter (1990) The Competitive Advantage of Nations

Porter (1990) 's Strategy

- **“The Appropriate government policy toward industry shifts as nations progress to successive stages of competitive development.”**
- **“The mix of policies at any one time must be mutually consistent and reflect the nature of competitive advantage in a nation’s industry.”**
- **“Government has the greatest direct influence on national advantage in the factor- and investment-driven stages.”**

Policy Implications for Followers

- **Strategic Vision & Comprehensive Review of Conditions**
- **Effective Innovation Policy Needs Fine-tuning with Industrial Policies**
- **Ever Adjusting Policy System**
- **Infrastructure and Human Resources**
- **Endogenous Innovation Capabilities**
- **Balanced Industrial Structure – Need both Large firms and SMEs**

Government Roles and Strategies for Innovation

