Innovation Ecosystems in East Asia

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- Research Interests
  - Innovation & Development
  - Technological Catchup
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Introduction

- South Korea's GDP per capita US$ 37,227 (2025)
- Projected to be US$ 49,276 (2027) by IMF
- Mostly driven by growth in high-tech manufacturing, e.g. semiconductors
- But how did South Korea manage this economic transition?
- Innovation!
- But what does this mean?

Development of South Korea

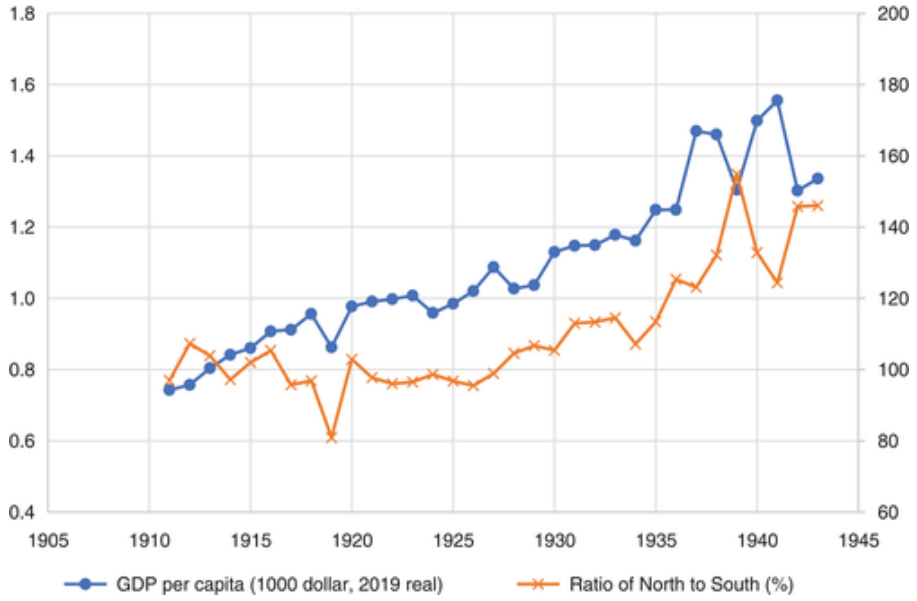
- South Korea is seen as an innovation powerhouse on the global stage because it is a rich country now
- But how did it become so?
- It was not always obvious as it is today
  - South Korea: GDP per capita: 1950s US$ 79 (est.)
  - North Korea: GDP per capita: 1950s US$ 177 (est.)

→ SK caught up by the 1960s

& surpassed NK in the 1970s



NASA 2014

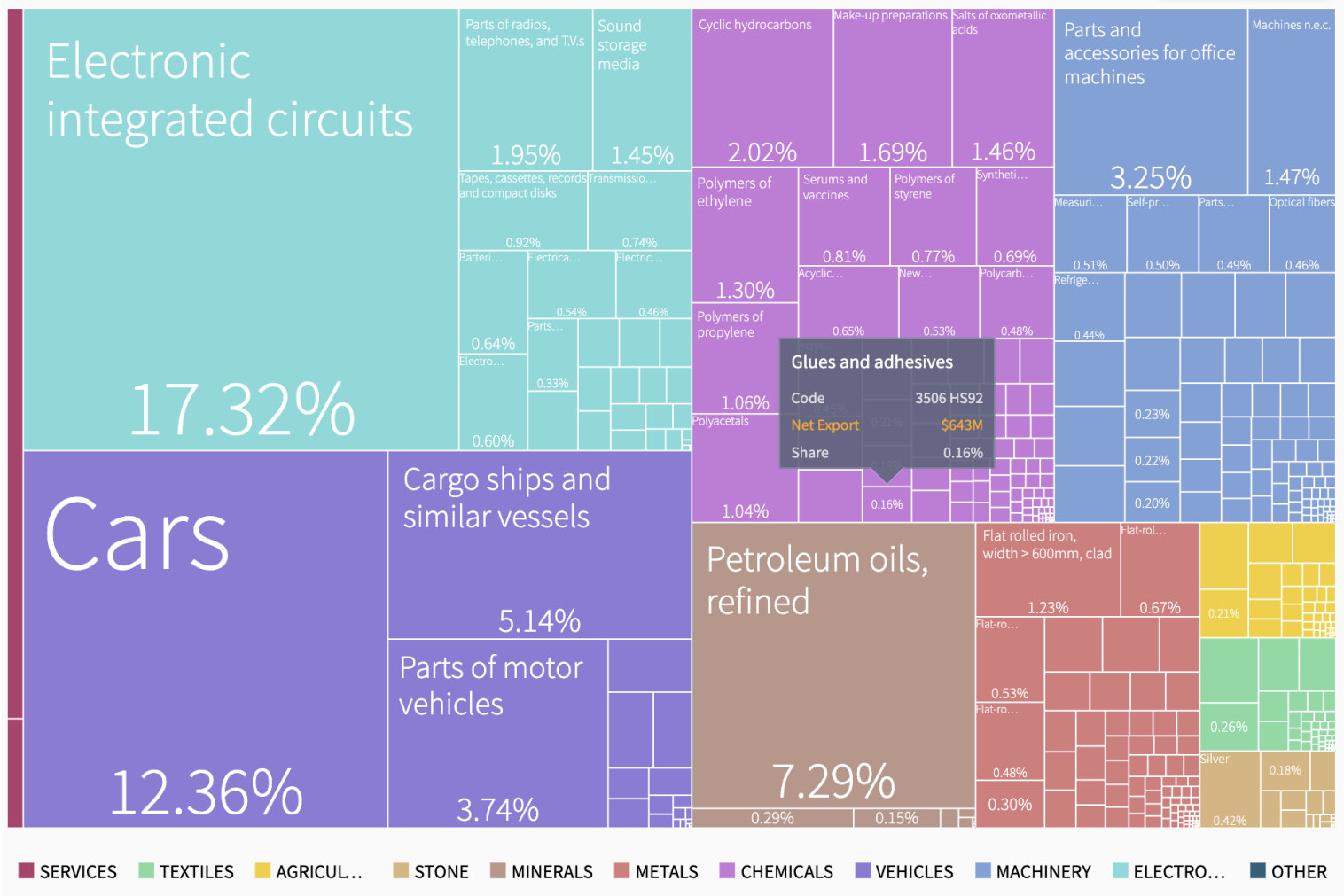


Kim et al 2018

Innovation Development of South Korea

- WIPO Global Innovation Index 2026: South Korea ranks 4th (1st in Asia)
- South Korea has managed to climb to the top of several global sectors
  - Automobiles, i.e. Hyundai-Kia
  - Shipbuilding, i.e. HD Hyundai, Hanhwa
  - Electronics
    - Semiconductors, i.e. Samsung Electronics, SK Hynix
    - Smartphones, i.e. Samsung Electronics
    - Displays, i.e. LG
  - K-pop Entertainment, i.e. HYBE, SM, CG
  - What is special about these sectors?

Export Basket, South Korea



Upgrading of Economic Structure

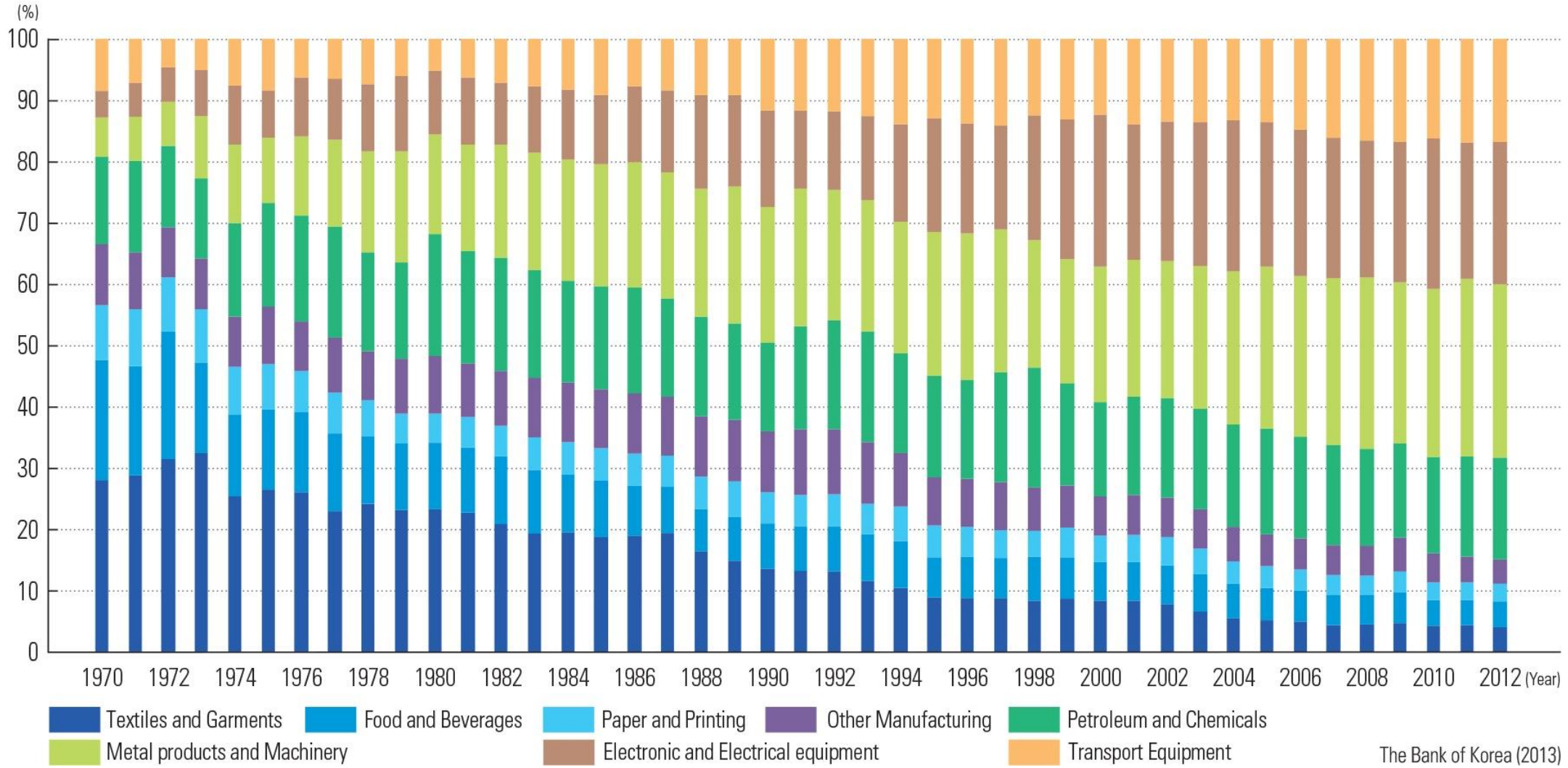
1960s

Rank	Sector
1	Clothing & Textiles (cotton, silk, and synthetic fabrics/nylon)
2	Plywood
3	Wigs (made from human hair)
4	Footwear and Shoes
5	Tinned/Canned goods

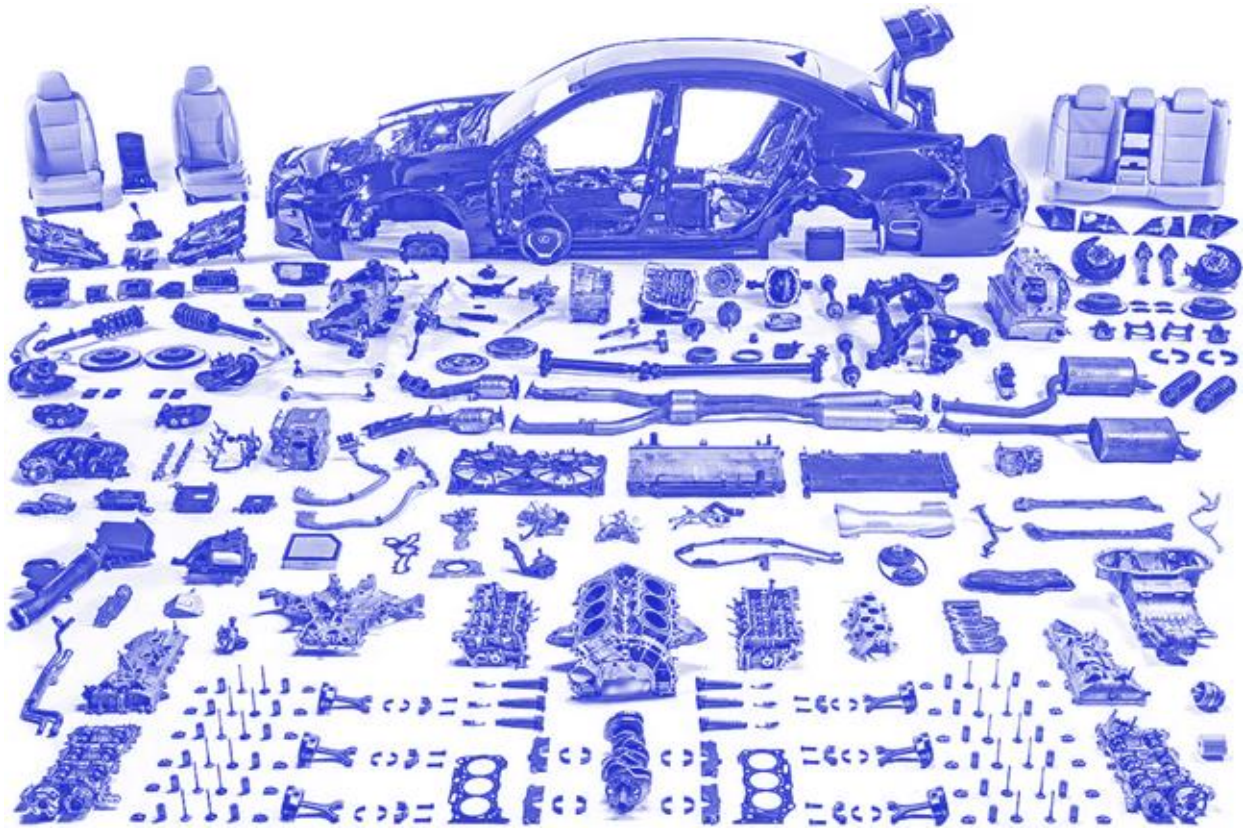
2010s

Rank	Sector
1	Semiconductors (Integrated Circuits)
2	Automobiles & Auto Parts
3	Ships & Offshore Structures
4	Petroleum & Mineral Fuels
5	Flat-Screen Displays & Optical Devices

Innovation Emergence

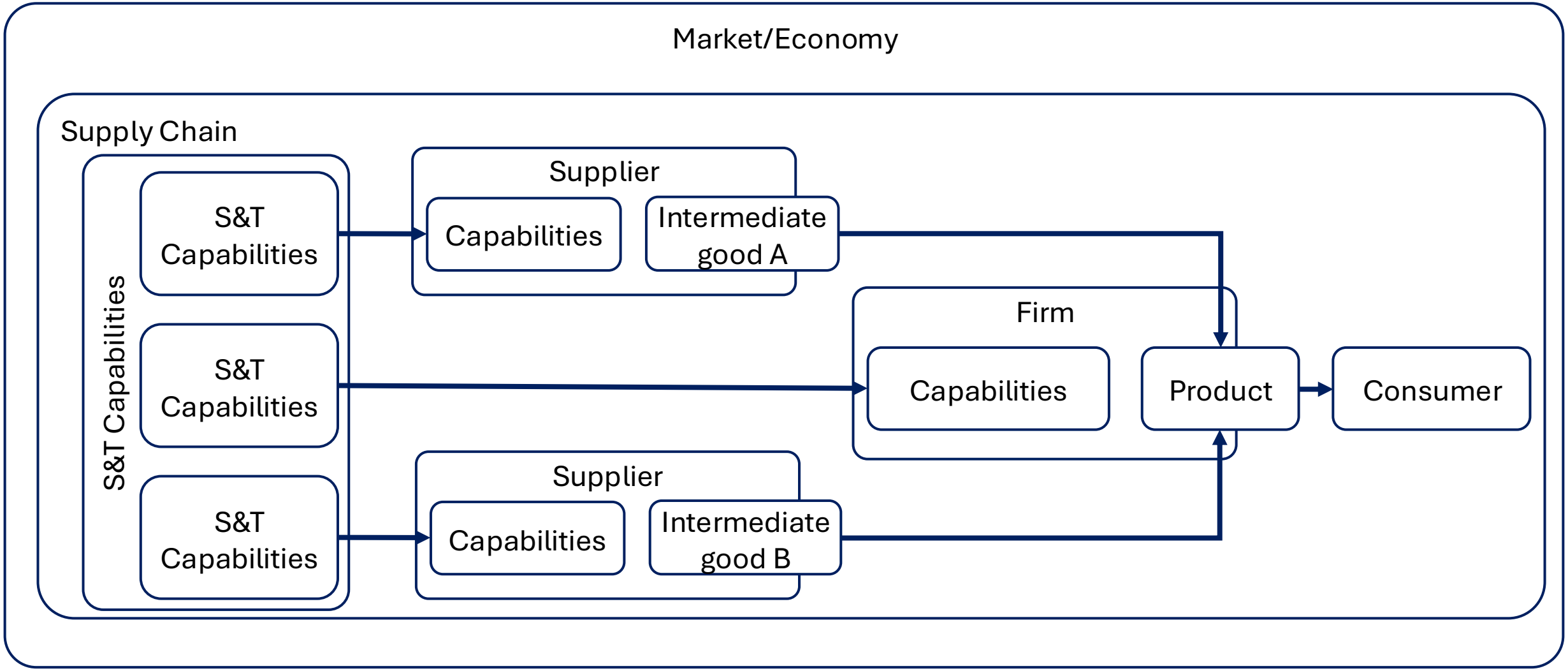


Automotive Production Supply Chain



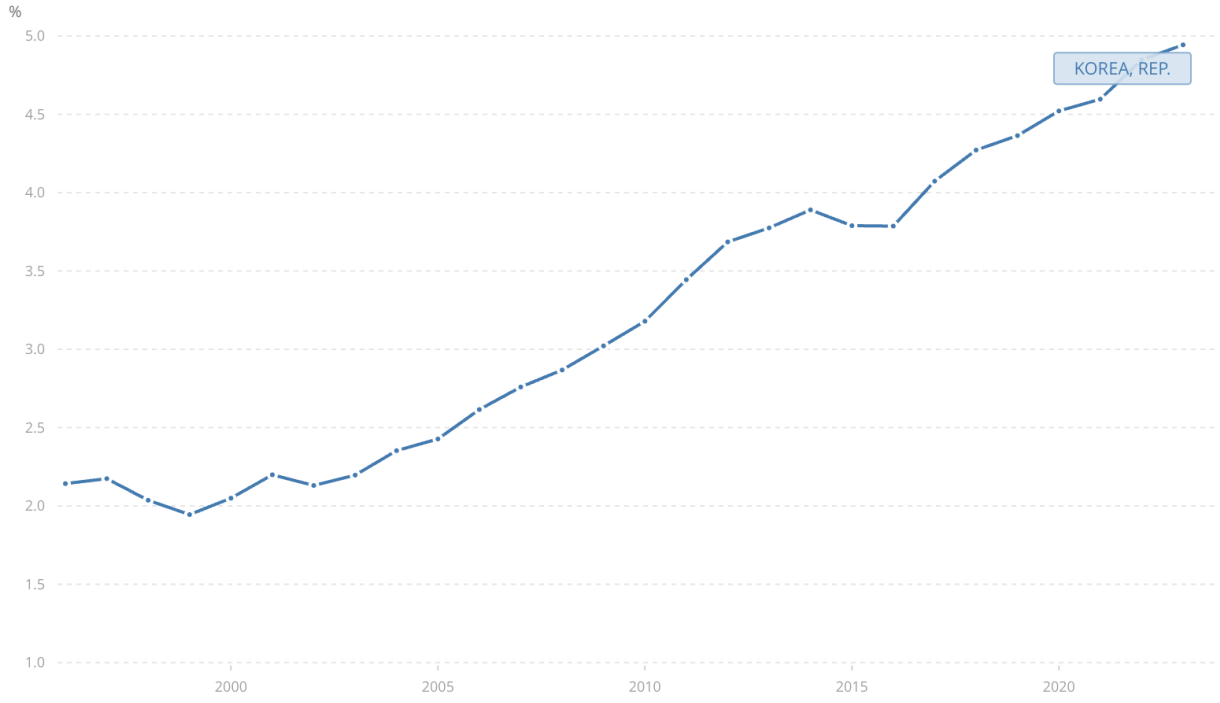
- Automobile producers
- Global Supply Chain
  - Tier 1 – Systems: Engine, electronics, transmission, braking, etc.
  - Tier 2 - Components: customized parts for system, airbag components, etc.
  - Tier 3 – Parts & raw material: Rubber/plastic parts, trim, wiring, etc.
- Different levels of value → Global Value Chain
- What differentiated the value?
  - Complexity → Knowledge
  - Authority → Institutions

Model of Innovation: Supply/Value Chain

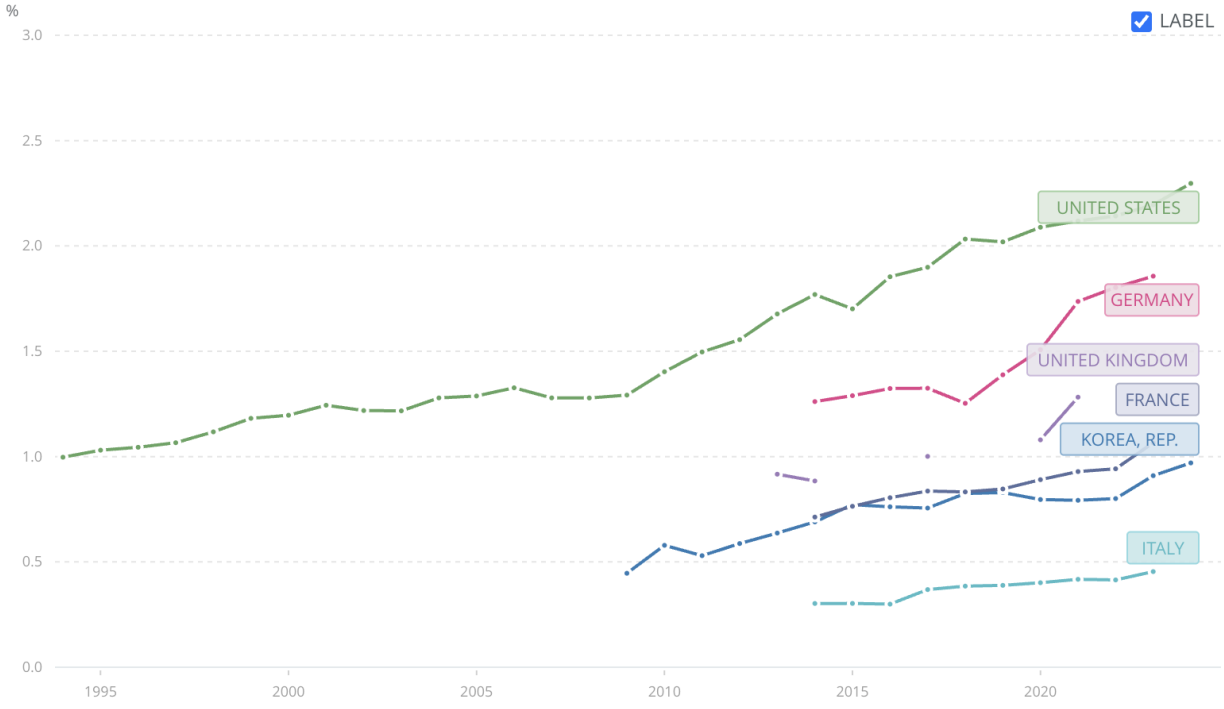


Research Capabilities

Research Intensity (R&D Expenditures % of GDP)



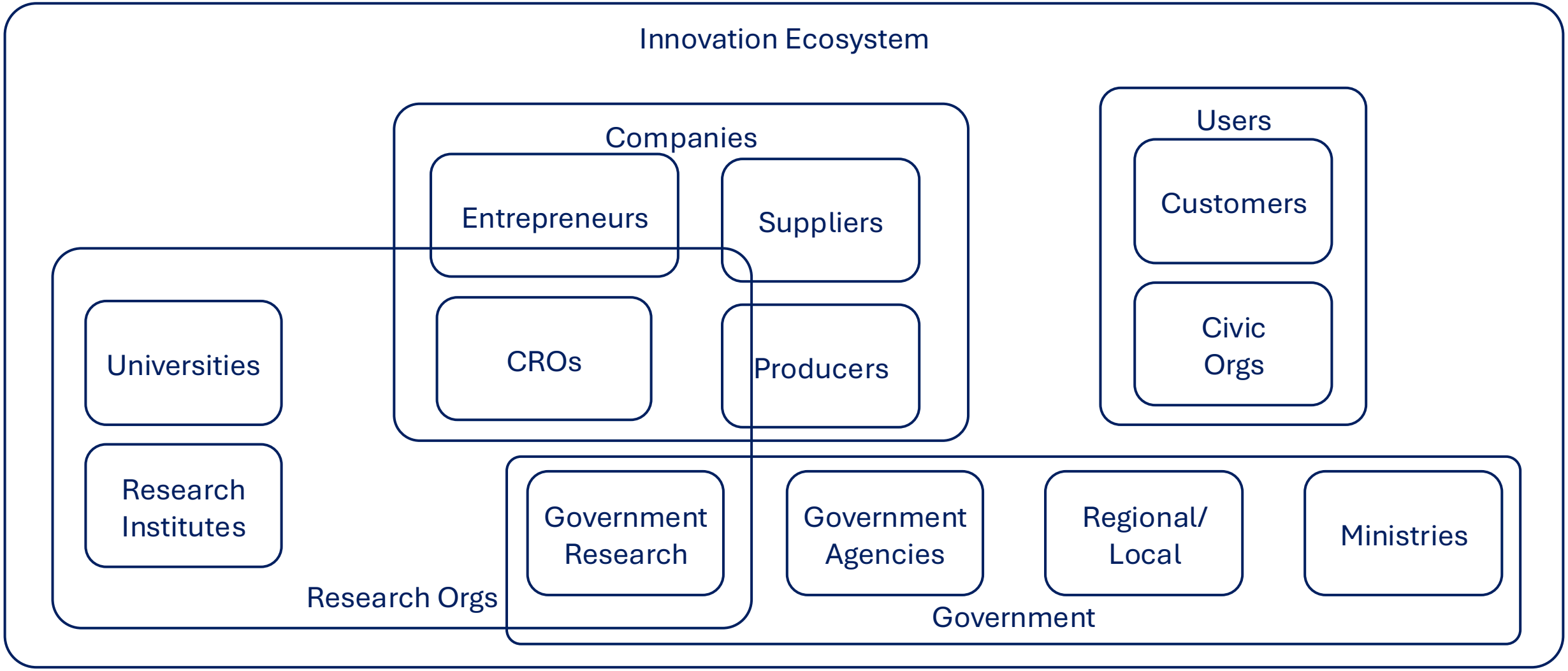
Researchers (% of population)



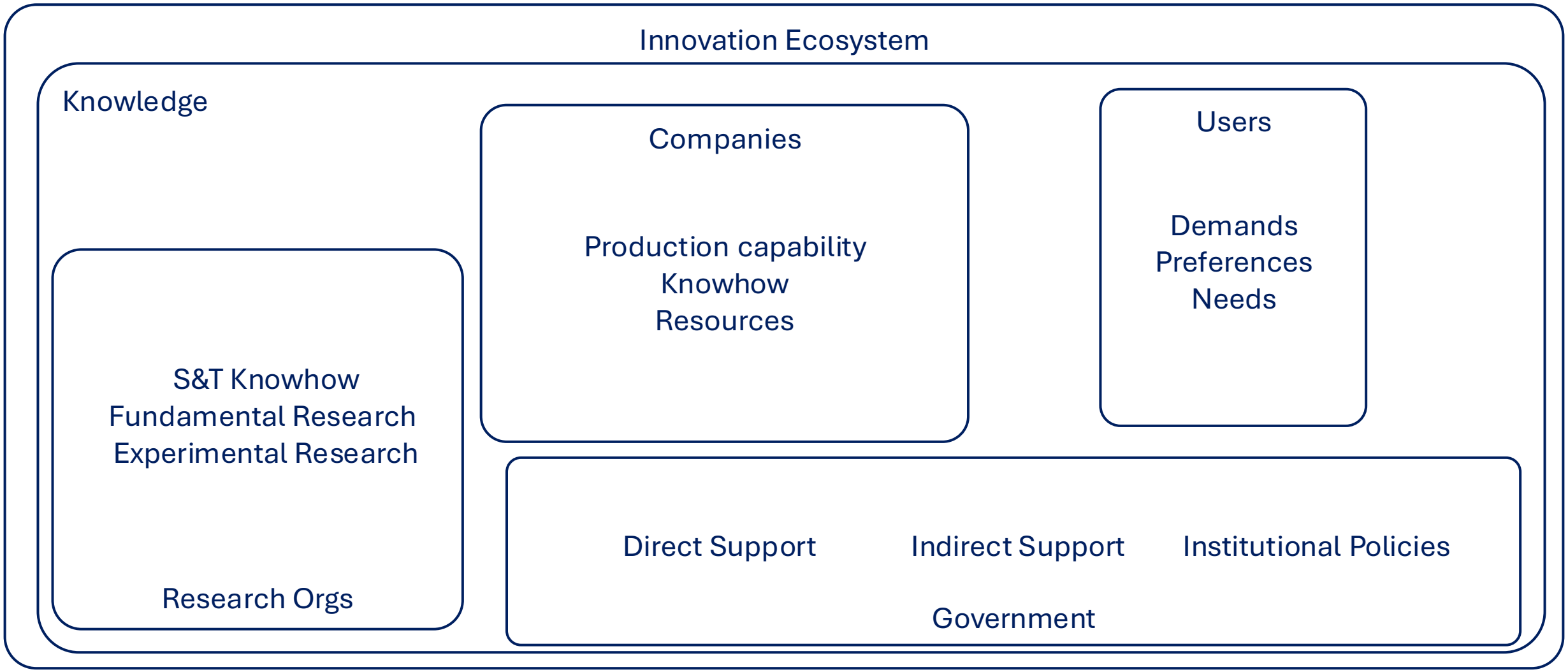
Innovation Ecosystem Actors

- Companies
  - Producers
  - Suppliers
  - Multinational Corporations (MNCs)
  - Entrepreneurs
- Research Organizations
  - Universities
  - Research Institutes
  - Government
  - Private Research, e.g. Contract Research Organizations (CROs)
- Government
  - Levels of Government (Ministerial, Regional, Local, International)
  - Public Agencies

Innovation Ecosystem Actors



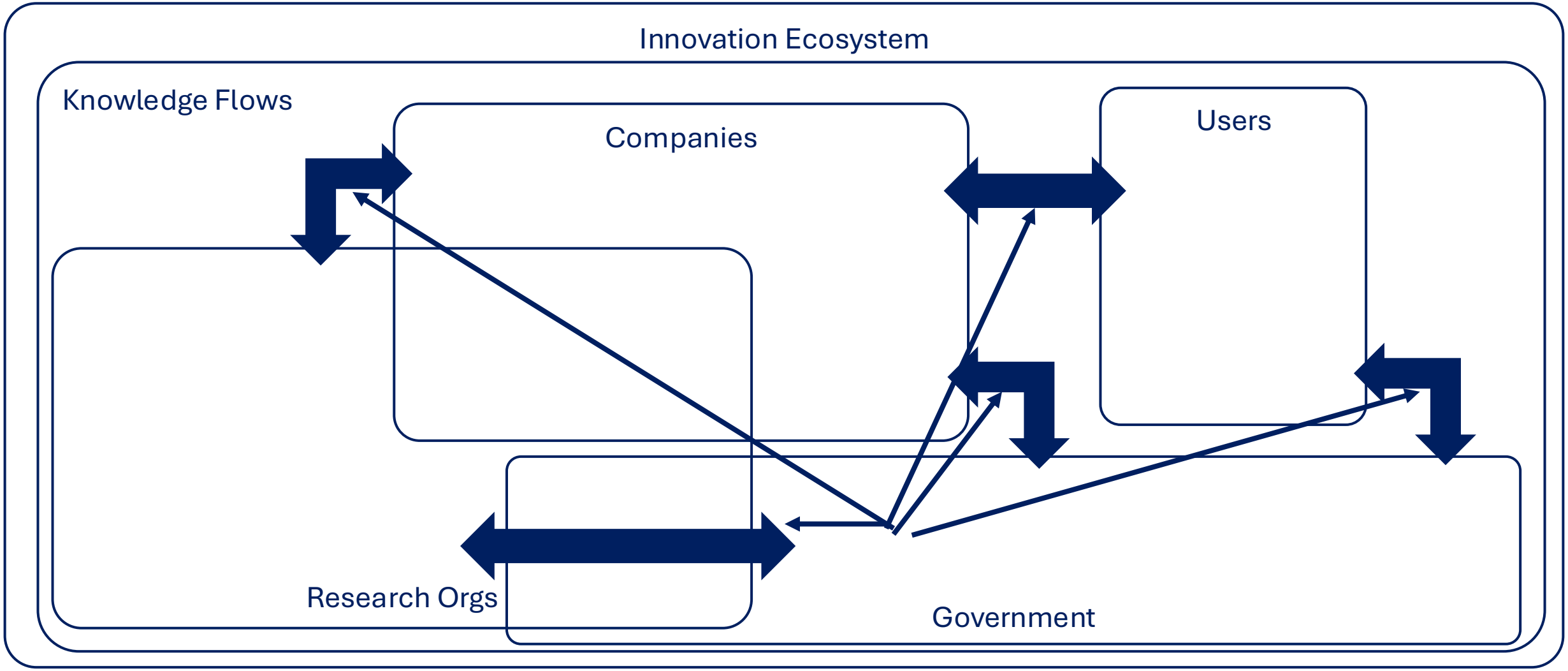
Innovation Ecosystem



Innovation Ecosystem Linkages

- Companies
  - Internal R&D
  - External R&D
- Companies & Users
  - Marketing
  - Customer Feedback
- Companies & Research Organizations
  - Applied Research (Market-oriented) → Unmet Market Demand → Technology Need → R&D
  - Basic Research (Pure) → New Discoveries → Innovation → Commercialization
- Government
  - Direct support, e.g. R&D funding, subsidies
  - Indirect support, e.g. supporting interactions across the ecosystem
  - Policies that govern the interactions

Innovation Ecosystem



Innovation Development Through Ecosystems

- Depends on what part of innovation
  - Different **sector domains** may provide different economic opportunities
  - Different **segments of value** chain
    - Concept (R&D) → Design → Manufacturing → Distribution → Marketing → Sales
- Different **actors** may work together on different parts of the global value chain
- The **networks & the strengths of their connections** can determine the outcome of the innovation activities
- These comprise the innovation ecosystem

Innovation Ecosystems in East Asia

- Korea provides an example of how innovation ecosystems advance economic growth
- Innovation ecosystems represent different **knowledge flows** that are needed for innovation capability development
- Innovation ecosystems
  - **Actors**
  - **Linkages**
  - **Institutions** & policies that change how actors & linkages behave
- Innovation ecosystems
  - Depend on the composition
  - Depend on the sector domains
  - Evolve according to how institutional flows direct knowledge for innovation

Thank you

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Veritas Lecture on Innovation Ecosystems

Debate 1

- Motion:

  Government policy should support universities prioritizing practical research over basic (theory-oriented) research

- Pro team supports the motion
- Con team opposes the motion (universities should support basic research)
- Consider:
  - Roles of different actors
  - Interactions between actors
  - Sources of practical & basic research

Debate 2

- Motion

  Developing countries in East Asia should adopt the same innovation ecosystem policies that South Korea did to promote innovation-driven growth

- Pro team supports the motion
- Con team opposes the motion (developing countries should adopt different innovation ecosystem policies than South Korea)
- Consider
  - Socioeconomic contexts
  - Innovation outcomes
  - Economic structures