How Korea Can Capitalize on the Next Production Revolution

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About ITIF

- The top ranked science and tech policy think tank in the world
- Formulates and promotes policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress
- Focuses on a host of issues at the intersection of technology innovation and public policy:
  - Innovation processes, policy, and metrics
  - Science policy related to economic growth
  - E-commerce, e-government, e-voting, e-health
  - IT and economic productivity
  - Innovation and trade policy

ITIF Publication Highlights

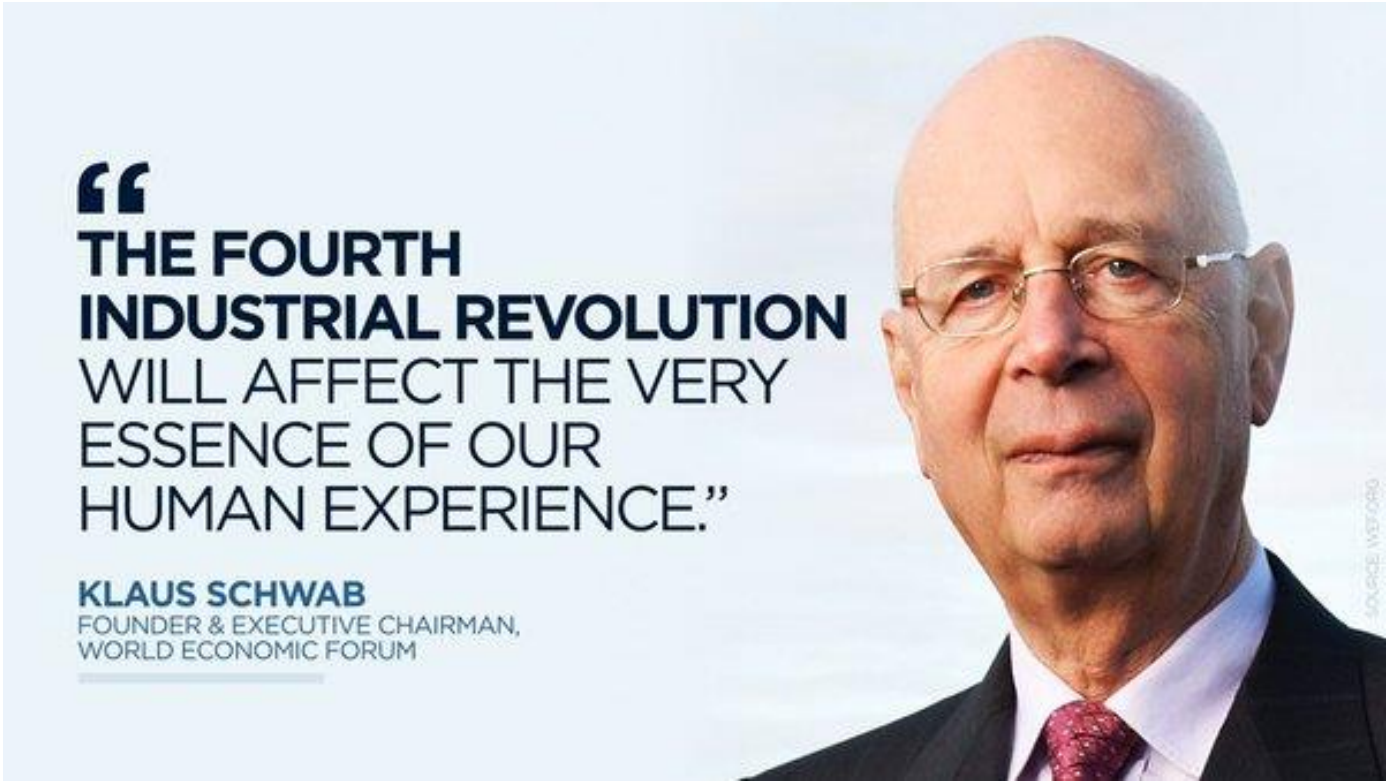
Today's Presentation

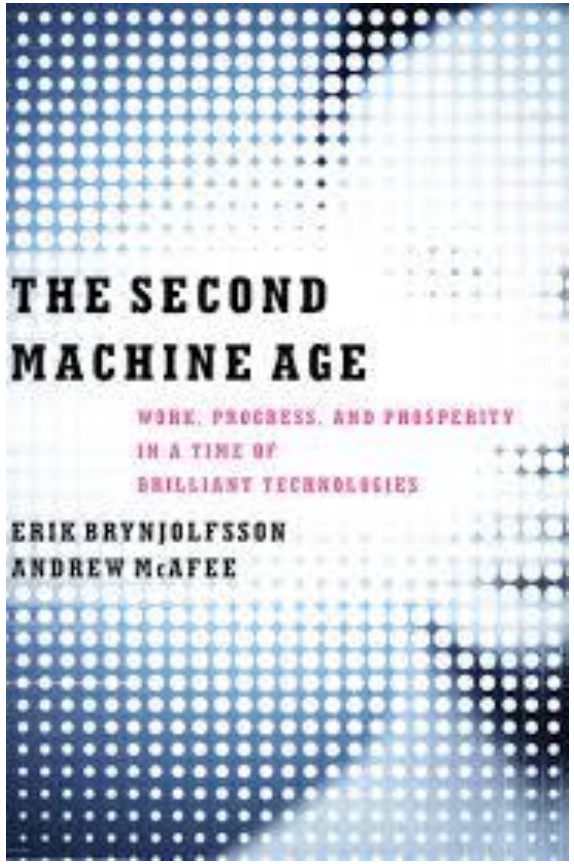
1 The Next Production Revolution

2 What Should Korea Do?: Spurring Innovation and Entrepreneurship To Develop the Technologies

3 What Should Korea Do?: Adopt the Technologies to Drive Productivity

Are We Poised for Epochal Transformation?





No: General Purpose Technologies Progress Along S-Curves

Electro-Mechanical Tech System

Digital Electronic Tech System

AI-Robotics Tech System

Takeoff	Installation	Slowdown	Takeoff	Installation	Slowdown	Takeoff	Installation
1945-58	59-74	74-92	93-2000	2001-2008	2009-21	2022-33	2039-??

GPT's Have 4 Characteristics

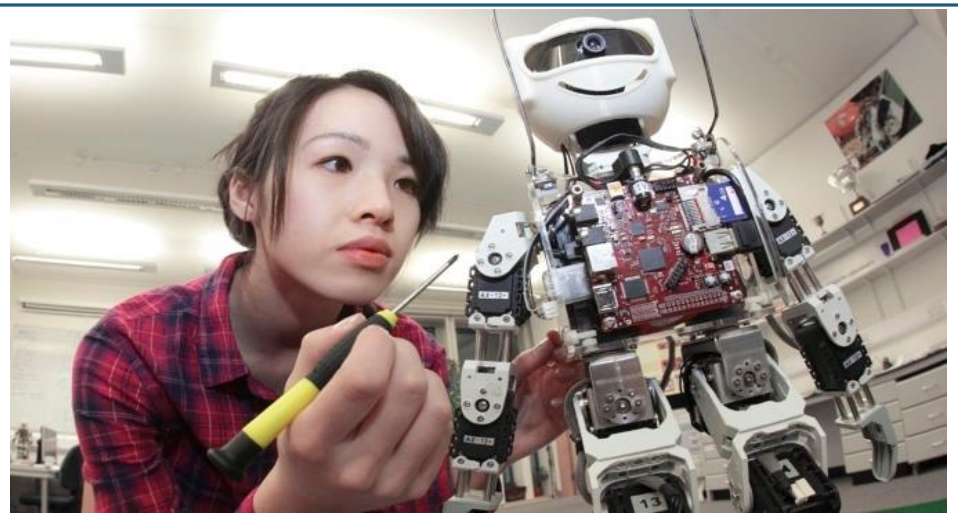
- **Pervasive:** used in and affects most sectors and functions
- **Accelerating:** rapid improvement in price and performance
- **Innovation enabling**: making it easier to invent and improve products, services and processes.
- **Impact:** affects macro-economic indicators, especially productivity and GDP

The Next GPT Technologies

- AI
- Robotics
  - IOT
  - Autonomous Systems
  - Blockchain

Korea's 2 Challenges and Opportunities

- **Developing and Producing the Technologies**



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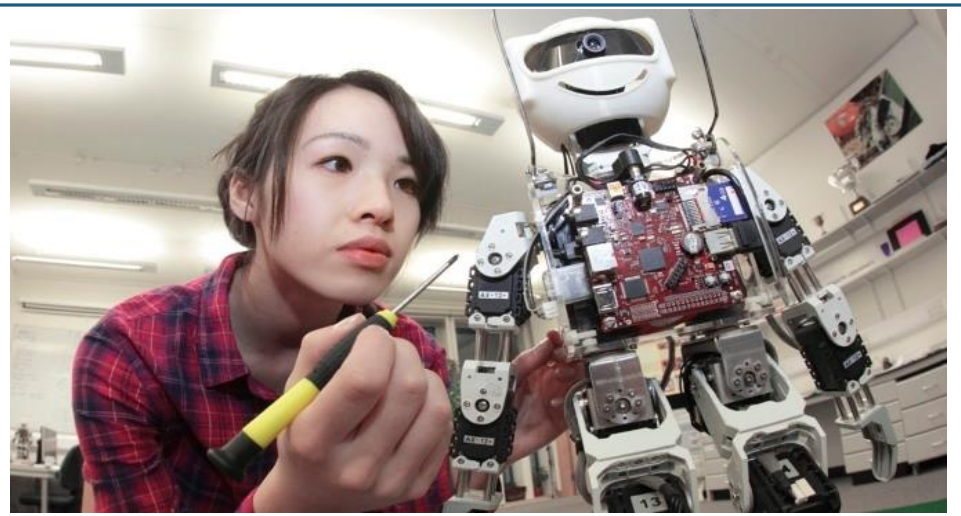

- **Using and Deploying the Technologies**

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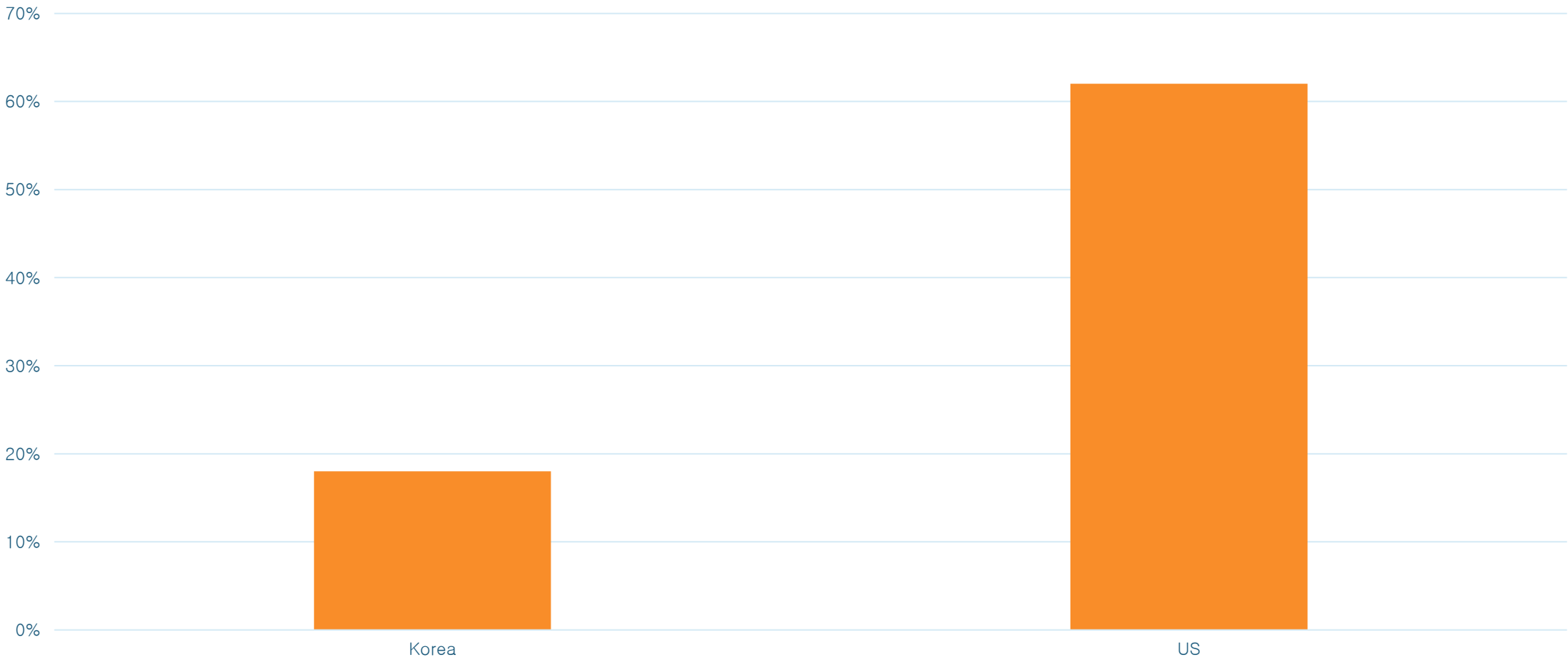
Developing and Producing the Next GPT Technologies

- Being a fast follower is no longer enough.
- Fast follower status has been incredibly beneficial to Korea
- But Korea risks being stuck in the middle between:
  - China and India as the new fast followers
  - The US. (and some Northern European Nations) as the leaders

Annual % change in processor speed

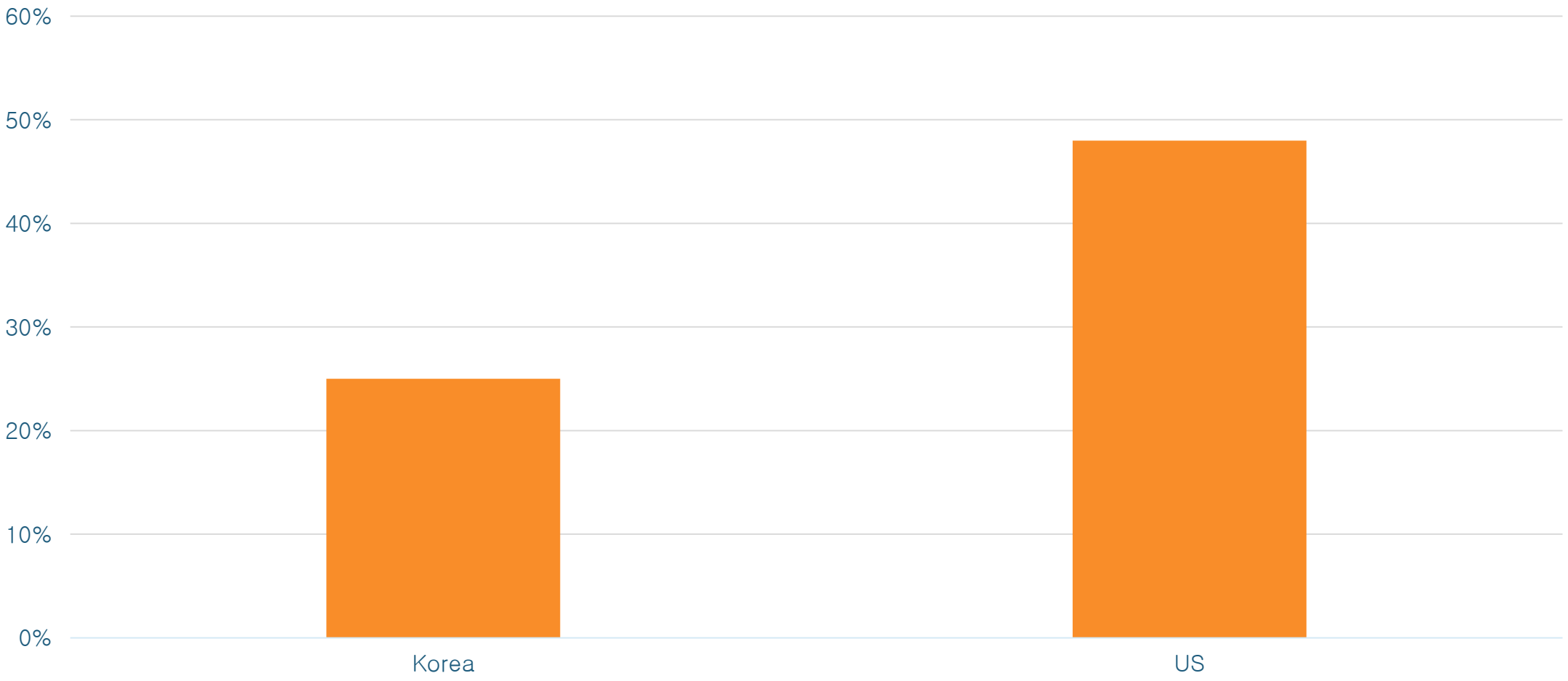
Korean Attitudes Toward Entrepreneurship Lag the U.S.:

% of Those Who Started a Business Out of Opportunity vs. Necessity



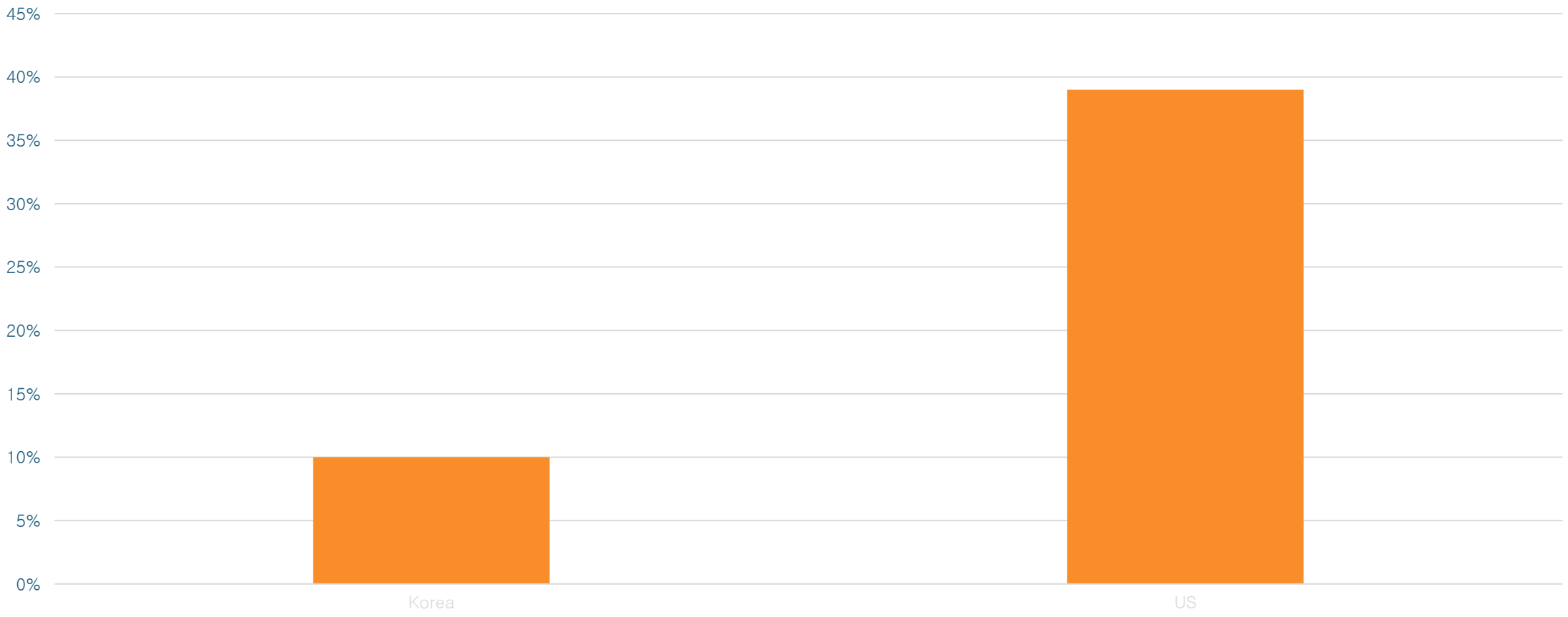
Source: Flash Eurobarometer 283: "Entrepreneurship in the EU and beyond" (2010)

"People Who Have Started Their Own Business and Have Failed Should Be Given a Second Chance"



Source: Flash Eurobarometer 283: "Entrepreneurship in the EU and beyond" (2010)

Share Who Agree: "In General, I Am Willing to Take Risks."



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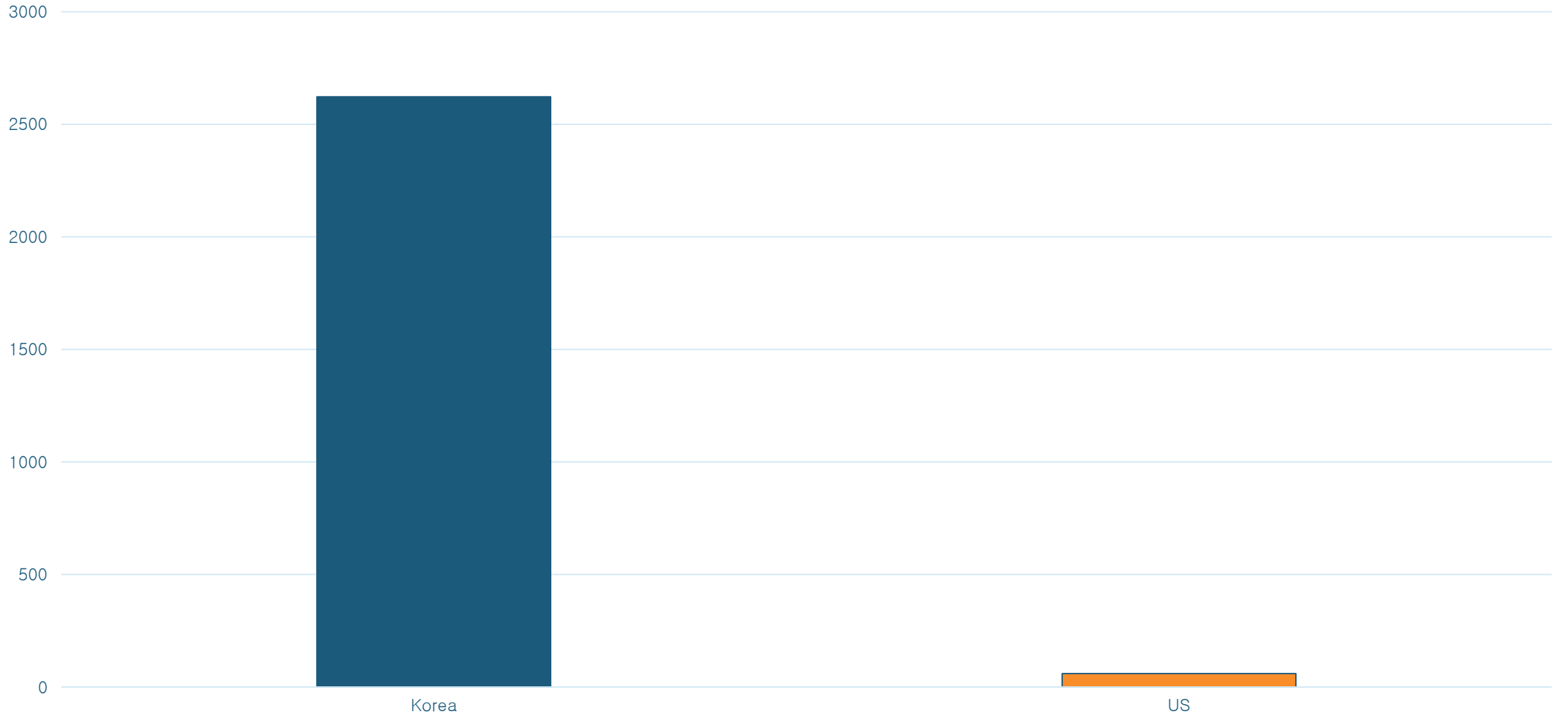
Becoming a Fast Follower: Entrepreneurship

- A culture of risk-taking that celebrates entrepreneurs
- Teach creativity and entrepreneurship
- Develop a support system for "gazelle" entrepreneurs

Becoming a Fast Follower: Commercialization

- **Diversify R&D**

Diversify Innovation: Korean R&D is Highly Concentated



HHI for corporate R&D

Becoming a Fast Follower: Commercialization

- Diversify R&D
- **Enable high growth gazelles**
- **Provide incentives for universities and labs to commercialize**

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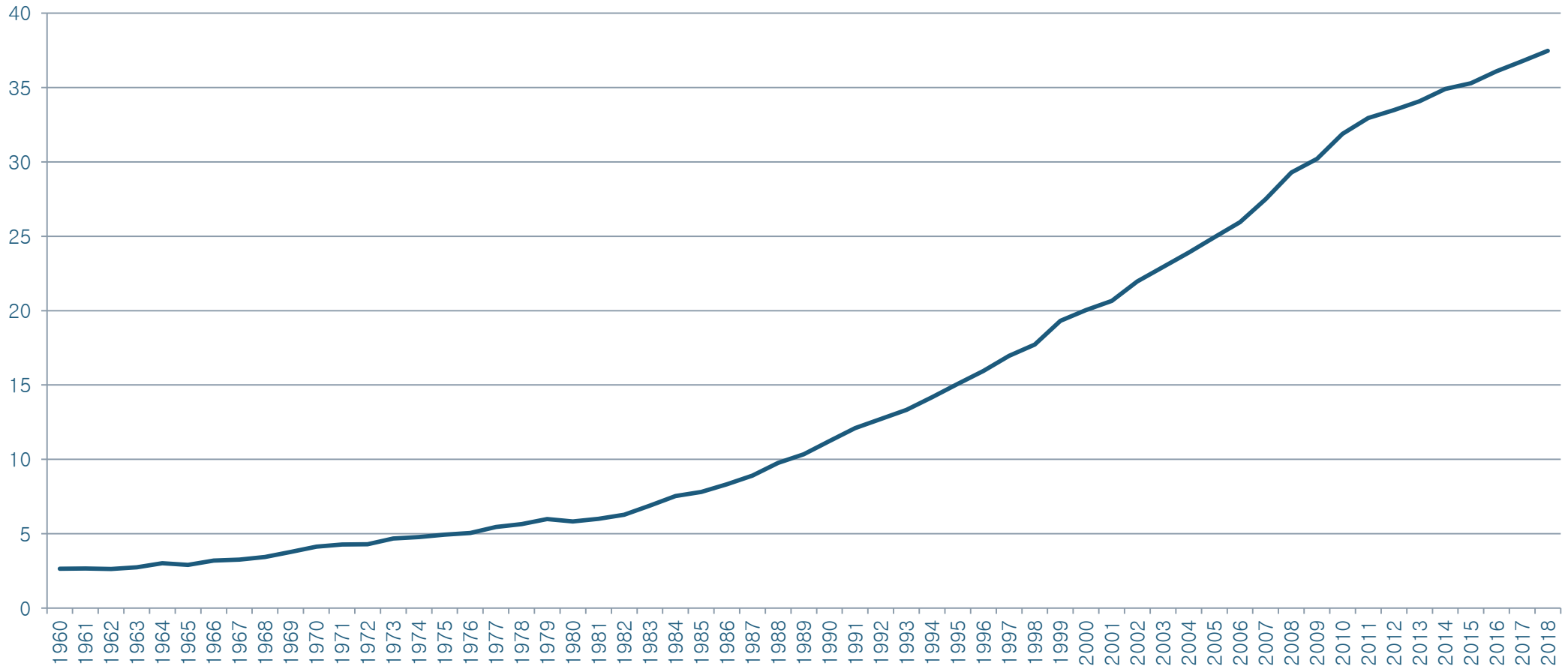
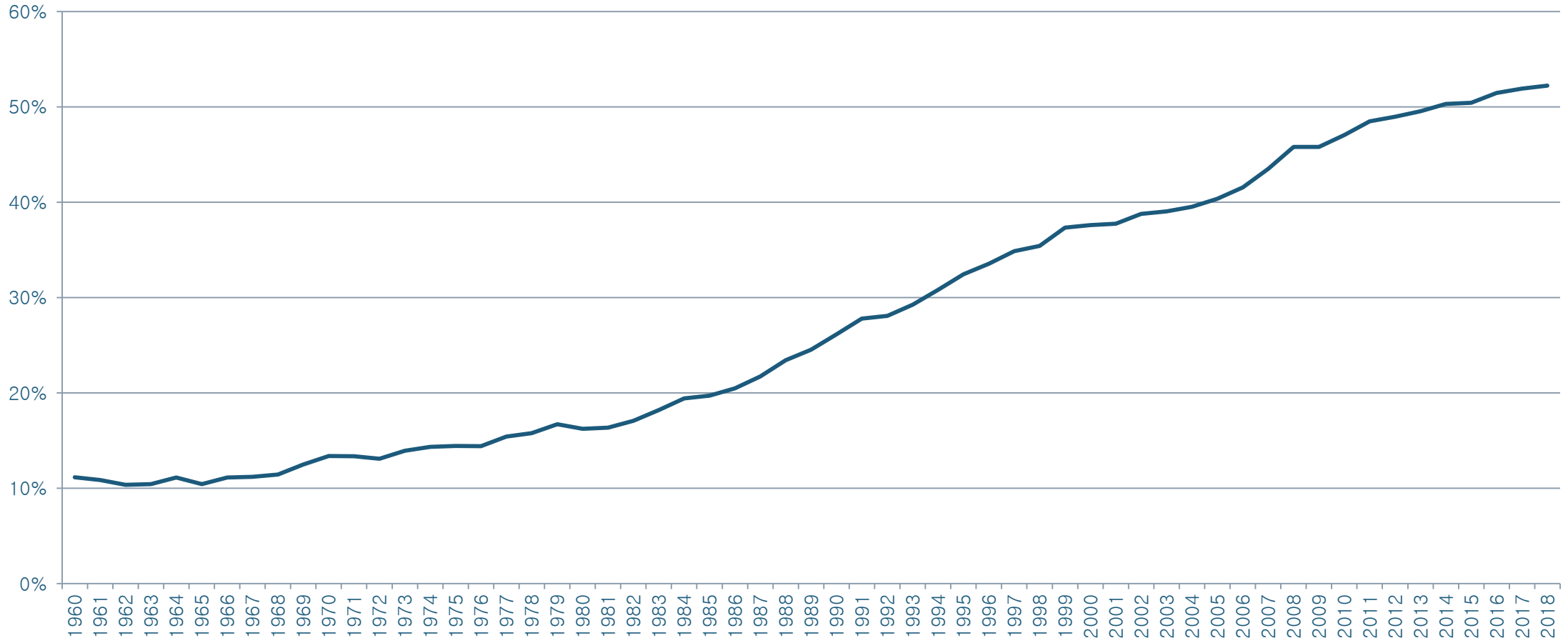
Korea Productivity Growth Has Slowed



The Productivity Gap With the U.S. Is Closing More Slowly



Korea Has Too Many Small Firms

- The share of output from large firms fell from 72% in the early 1970s to around 50% in 2006.
- The share of employment in SMEs increased from 80% in 2000 to 87% by 2010 (compared to 44% in the US).
- In services sector, 91% of jobs are in SMEs, compared to 44% in the US.
- 99.9% of firms are small.

This Hurts Growth

- Small firms (5 to 49 workers) are 22% as productive as firms with over 200 workers. – *Rana Hasan And Karl Robert L. Jandoc, "The Distribution of Firm Size in India: What Can Survey Data Tell Us? ADB Economics Working Paper Series, No. 213, August 2010, https://www.adb.org/sites/default/files/publication/28418/economics-wp213.pdf*
- Workers at small firms in Korea make 50% of workers at large firms.
- SME services firms have productivity 45% of large firms.

Boosting Productivity Requires All Sectors to Improve

- Services productivity levels fell from 76 percent of manufacturing in 1997 to 60 percent in 2005.

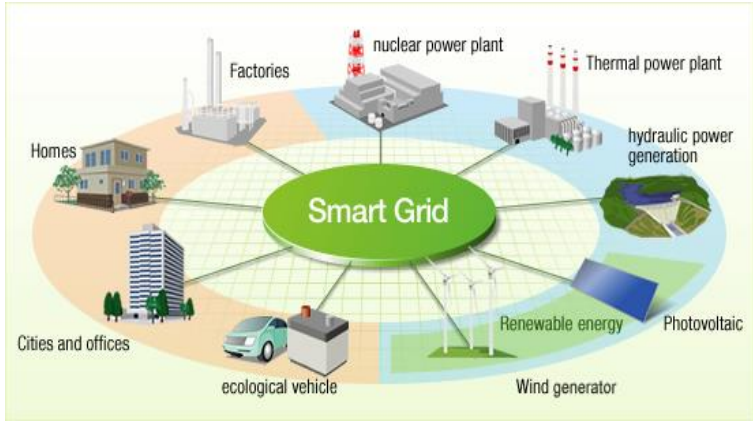
- Service sector productivity is just 45% of manufacturing levels, compared with an OECD average of 86%

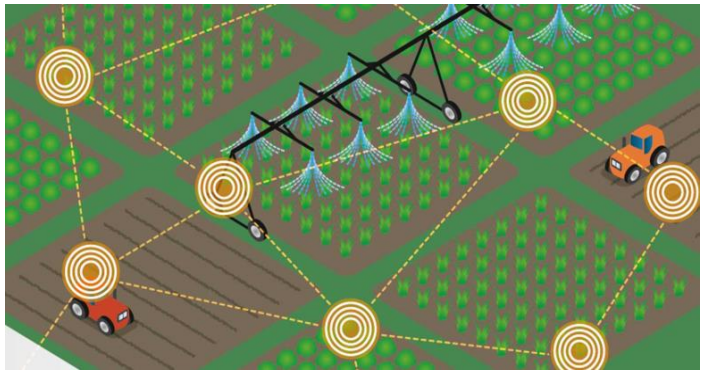
And All Sectors to Use ICT

- Korea is strong on ICT production; weaker on ICT adoption.
- In 2011, ICT investments in Korea were 10% of business investments compared to over 30% in U.S.
- From 2005 to 2010, IT capital contributed to just 8% of Korean growth compared to 30% in U.S.
- Of 20 OECD nations, 12 nations, including Germany, Japan, and U.S. demonstrate more growth from ICT investments than non-ICT investments.

Make Government a Force for Digital Innovation in All Industries

- Industry 4.0
- Agriculture 4.0
- Mining 4.0
- Electricity 4.0
- Education 4.0
- Financial Services 4.0
- Transportation 4.0





Thank You

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