

Automation, U.S. Manufacturing and Jobs

Presentation to the National Economist Club

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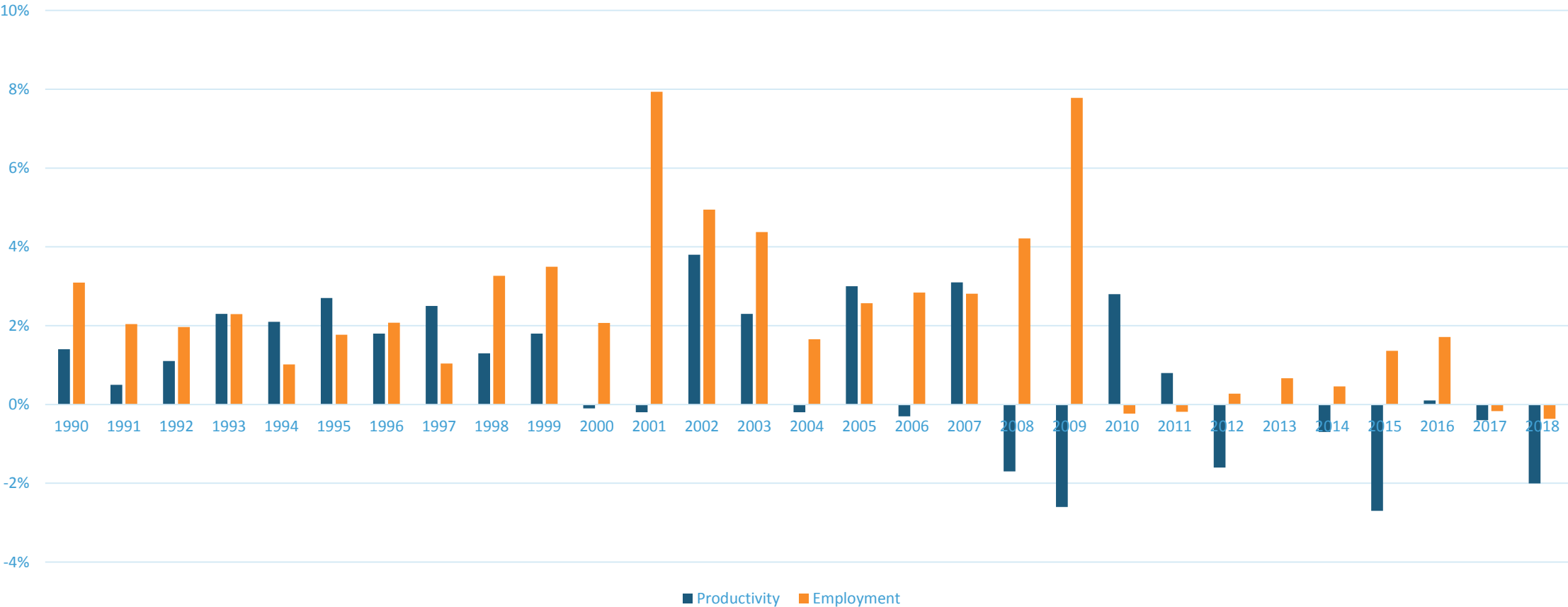
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About ITIF

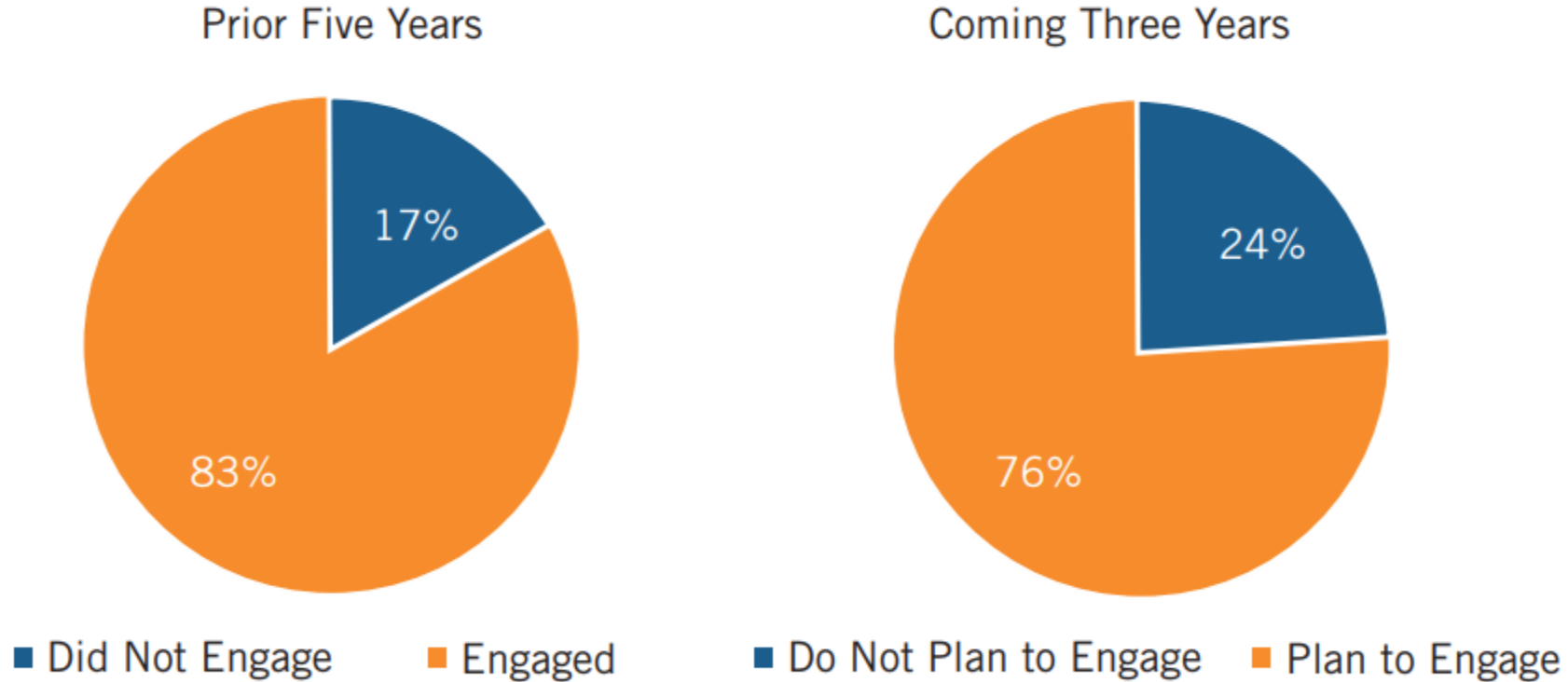
- The world's top ranked science and technology think tank
- Formulates and promotes policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress
- Focuses on a host of issues at the intersection of technology innovation and public policy:
 - Innovation processes, policies, and metrics
 - Science policy related to economic growth
 - Digital technology issues (e.g., e-commerce, e-government, e-health)
 - IT and economic productivity

Productivity and Job Growth in the U.S. Economy (Employment Growth In Total Economy Relative to Total Economy; Productivity Growth in Manufacturing Relative to Total Economy)



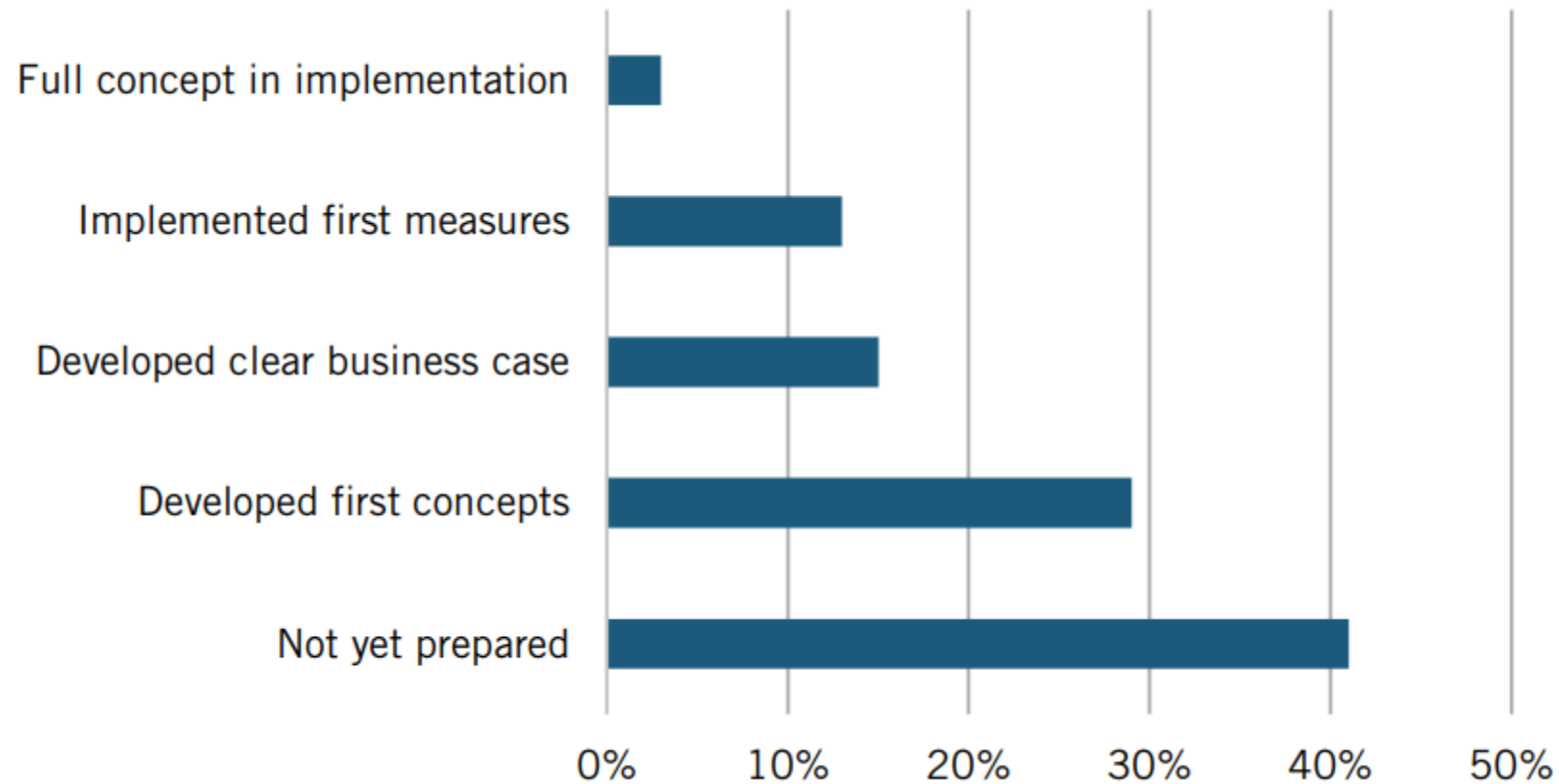
Source: Bureau of Labor Statistics, Major Sector Productivity, Costs, and Employment

Percent Manufacturers Engaged in Automation Investment in the Prior 5 Years and Planning to Engage in Automation Investment in the Coming 3 Years (December 2015)



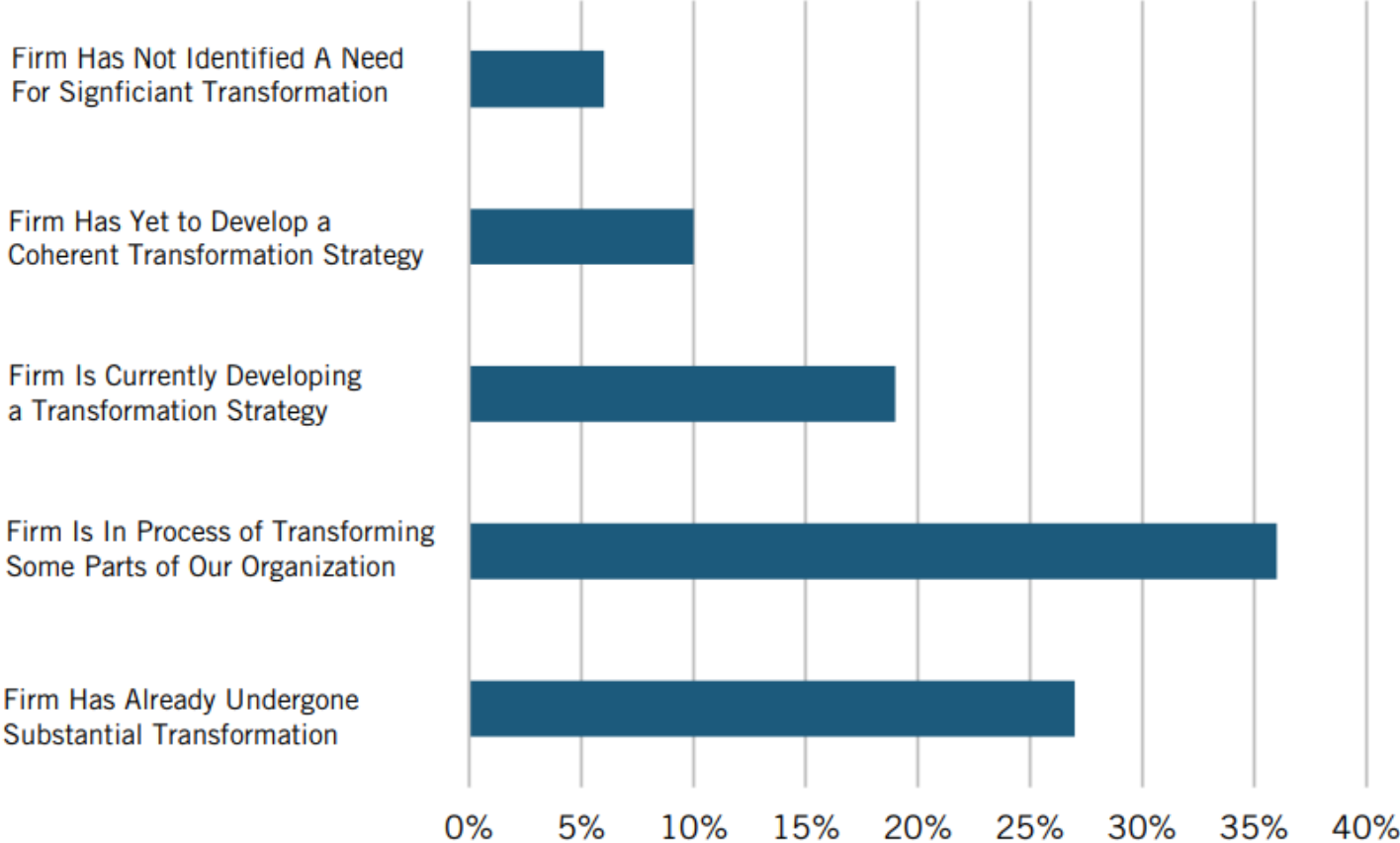
Source: Cliff Waldman, "Automation Investment in U.S. Manufacturing: An Empirical Picture" (Manufacturers Alliance for Productivity and Innovation (MAPI), June 2016).

U.S. Manufacturers' Preparedness for the Introduction of New Technologies for Industry 4.0, (March 2016)



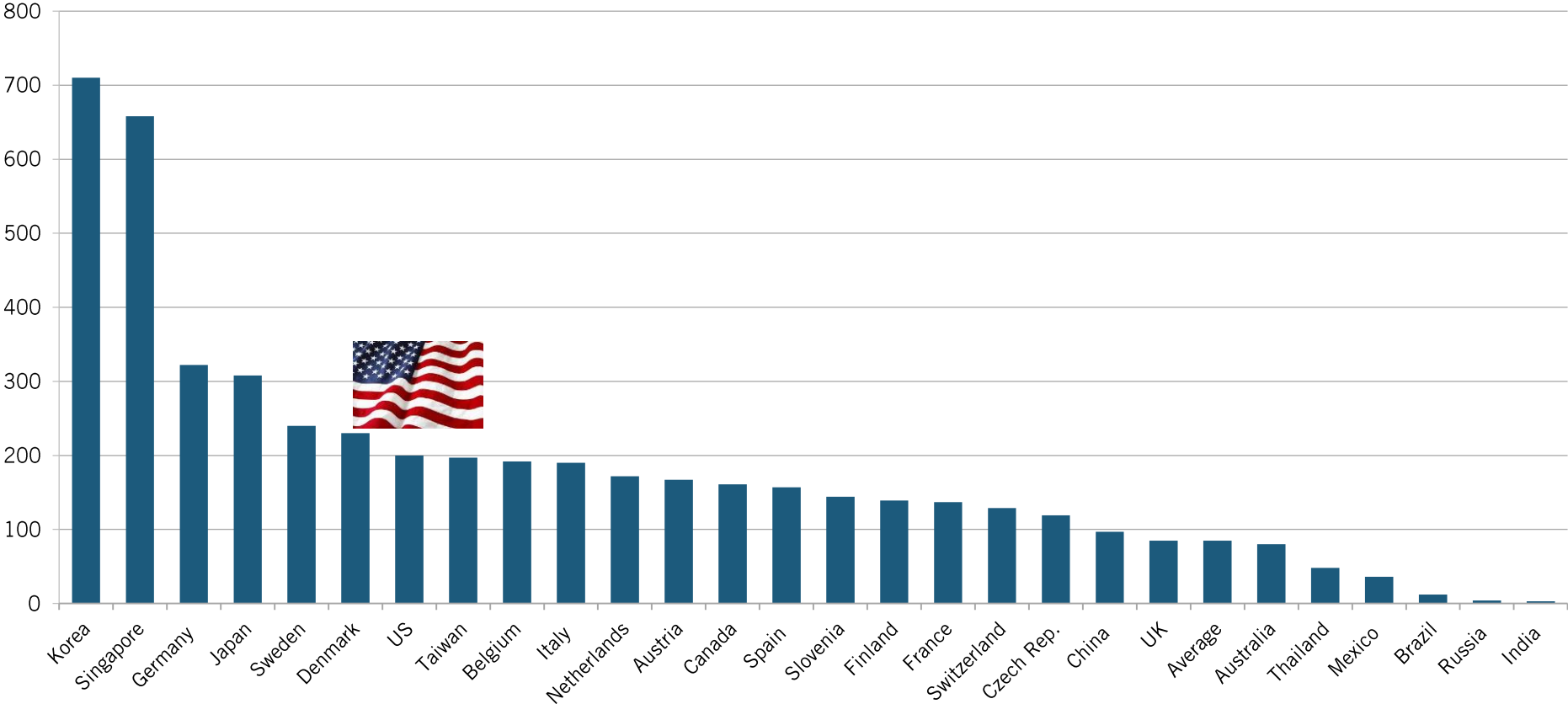
Source: Boston Consulting Group "Time to Accelerate in the Race Toward Industry 4.0"

Extent of U.S. Manufacturers' "Industrial Transformations," (July 2017)



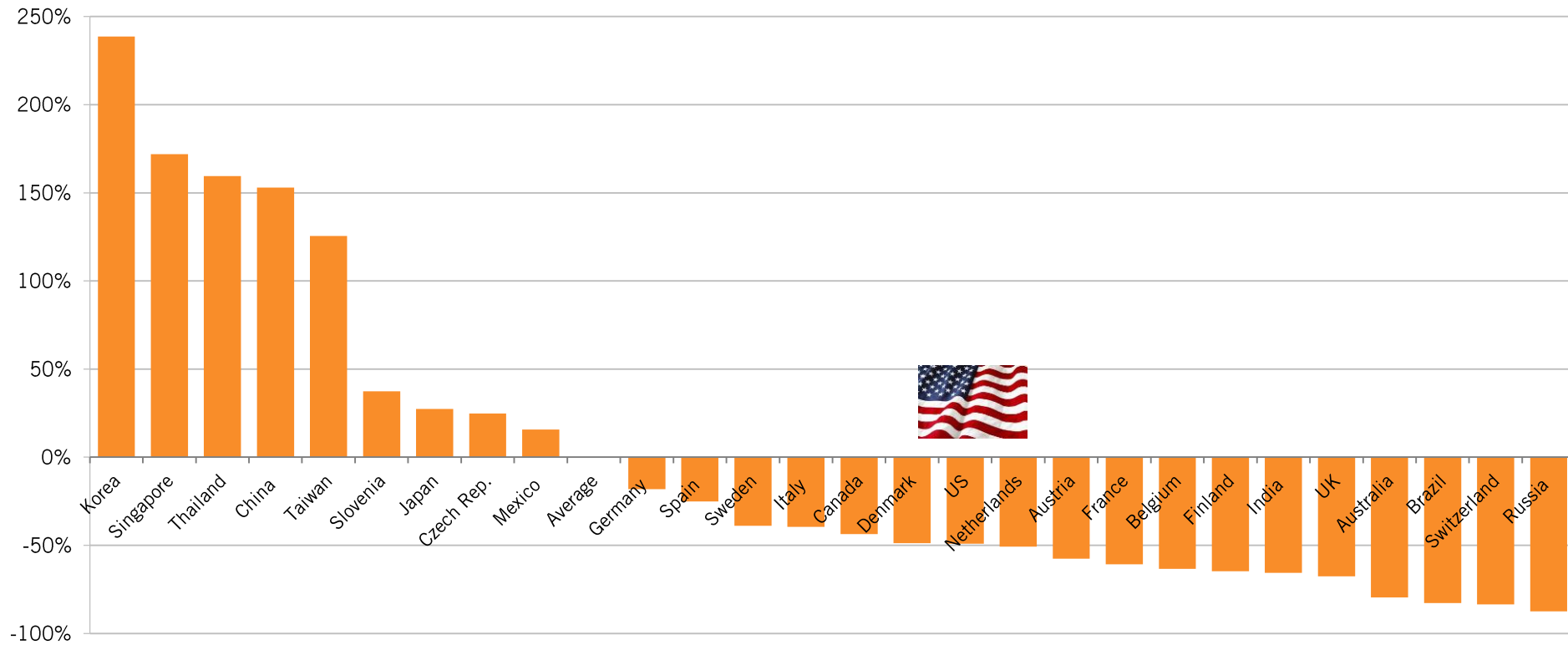
Source: Economist Intelligence Unit and Prudential, "Manufacturing in Motion: Transforming Manufacturing for a New Industrial Era."

Robots Per 10,000 Manufacturing Workers, 2017



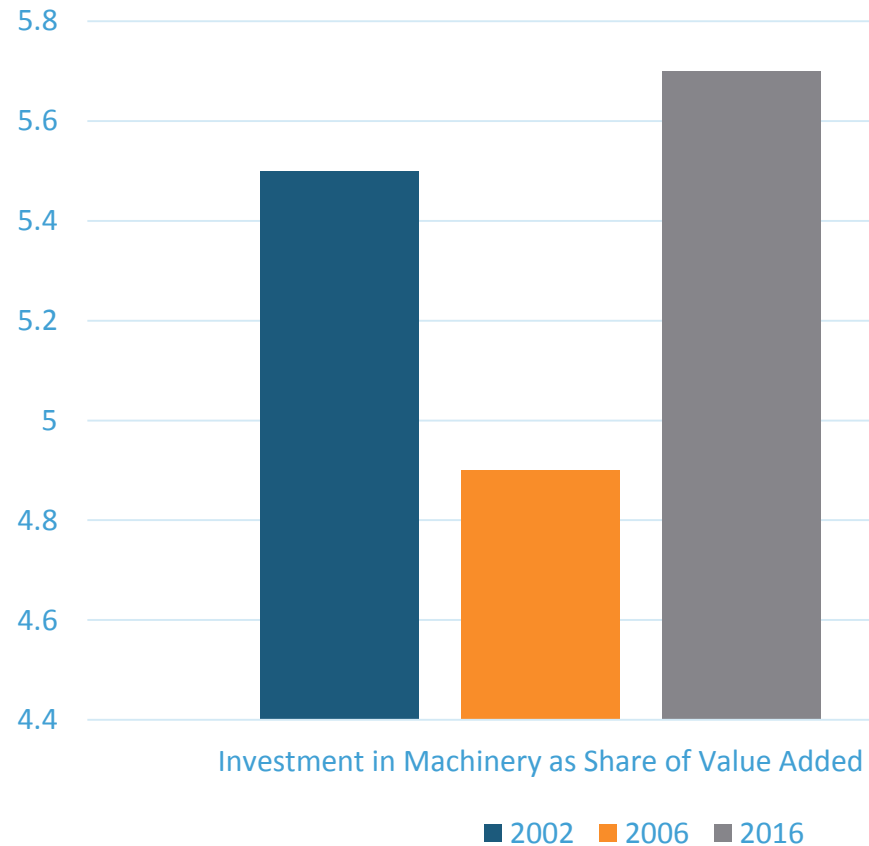
Source: International Federation of Robotics, “Robot Density Rises Globally,” news release, February 7, 2018, <https://ifr.org/ifr-press-releases/news/robot-density-rises-globally>.

Actual Robot Adoption Rate as a Share of Expected Robot Adoption Rate



Source: ITIF calculations

So Why Has Productivity Growth Slowed? Not a Fall in CapEx



Source: U.S. Census Bureau, Annual Survey of Manufacturers

Poor Policies

- Weak tax incentives to invest in machinery
- Weak policies to support manufacturing skill development
- Limited funding for manufacturing extension (e.g., NIST's MEP)
- Poorly supported high-performance clusters (e.g., technical colleges)

We Are Between Technology Long Waves

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-??

Thank You!

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