

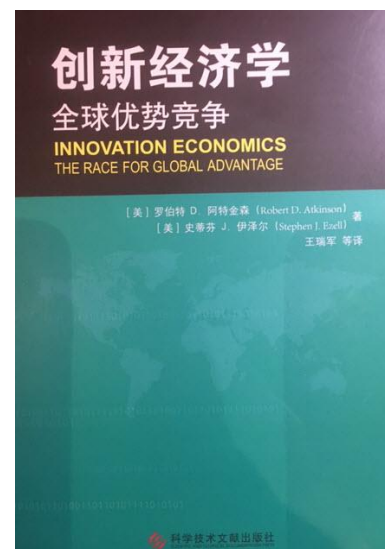
CSIA-SIA Workshop on Promoting Global Semiconductor Value Chain Cooperation

Stephen Ezell
Vice President, Global Innovation Policy

May 19, 2016

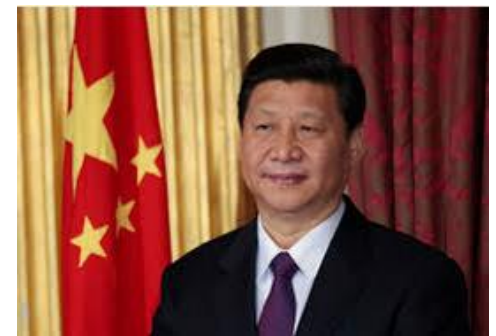
About ITIF

- One of the world's top science and technology think tanks.
- 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 and trade policy
 - Innovation processes, policy, and metrics
 - Science policy related to economic growth
 - IT and economic productivity



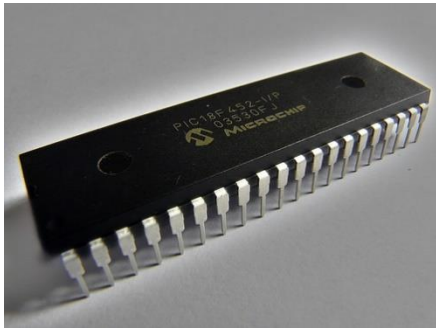
Two Paths for China's Manufacturing Economy

1. Indigenous innovation, development of internal value chains and manufacturing technology ecosystems.
2. Participation in global value chains (including technology absorption) for the development of advanced manufacturing technology products.



Manufacturing Policy Must Get the 4 “Ts” Right

Technology



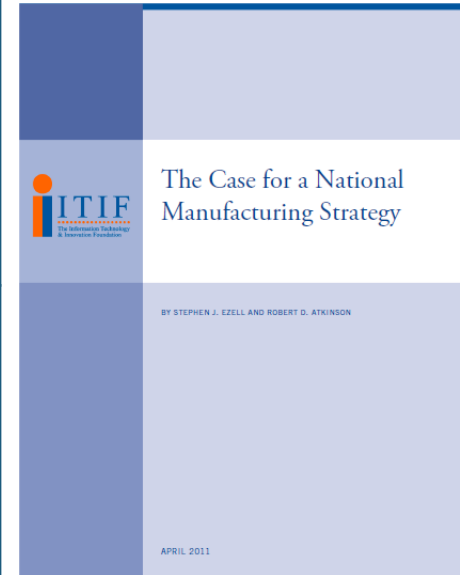
Tax

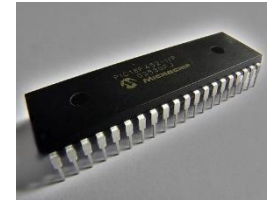


Trade



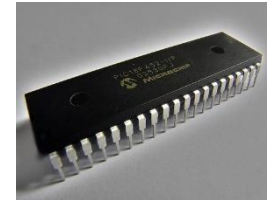
Talent





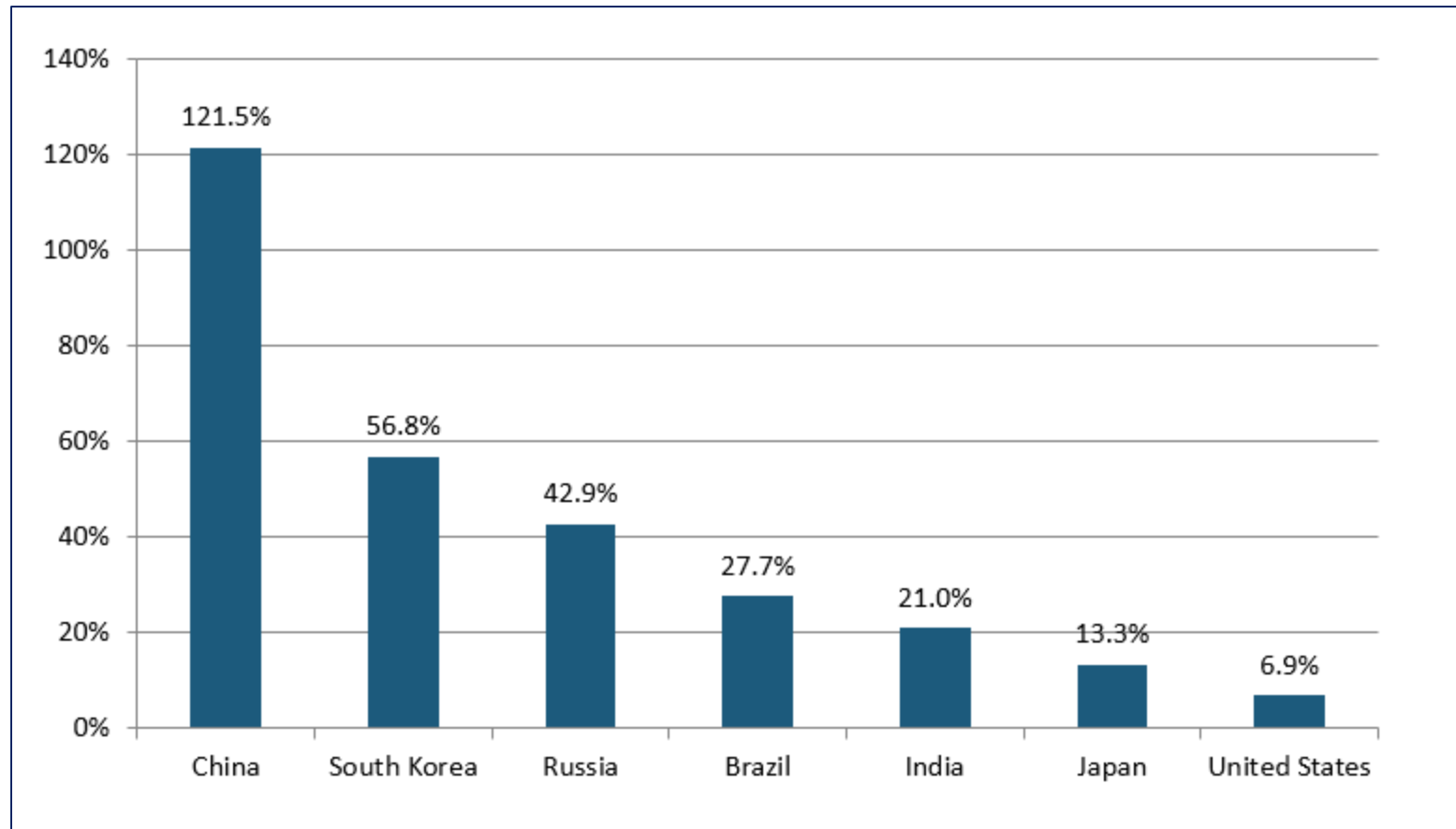
Manufacturing Technology

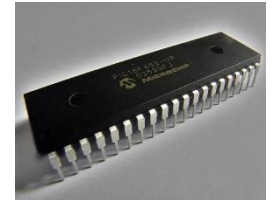
1. Robust investments in both basic scientific and industrially relevant applied research (R&D).
2. Platforms aligning academia, industry, and government in public-private partnerships supporting advanced manufacturing product and process innovation.
3. Bolstering the capabilities of SMEs throughout a nation's manufacturing supply chain.



Manufacturing Technology – R&D

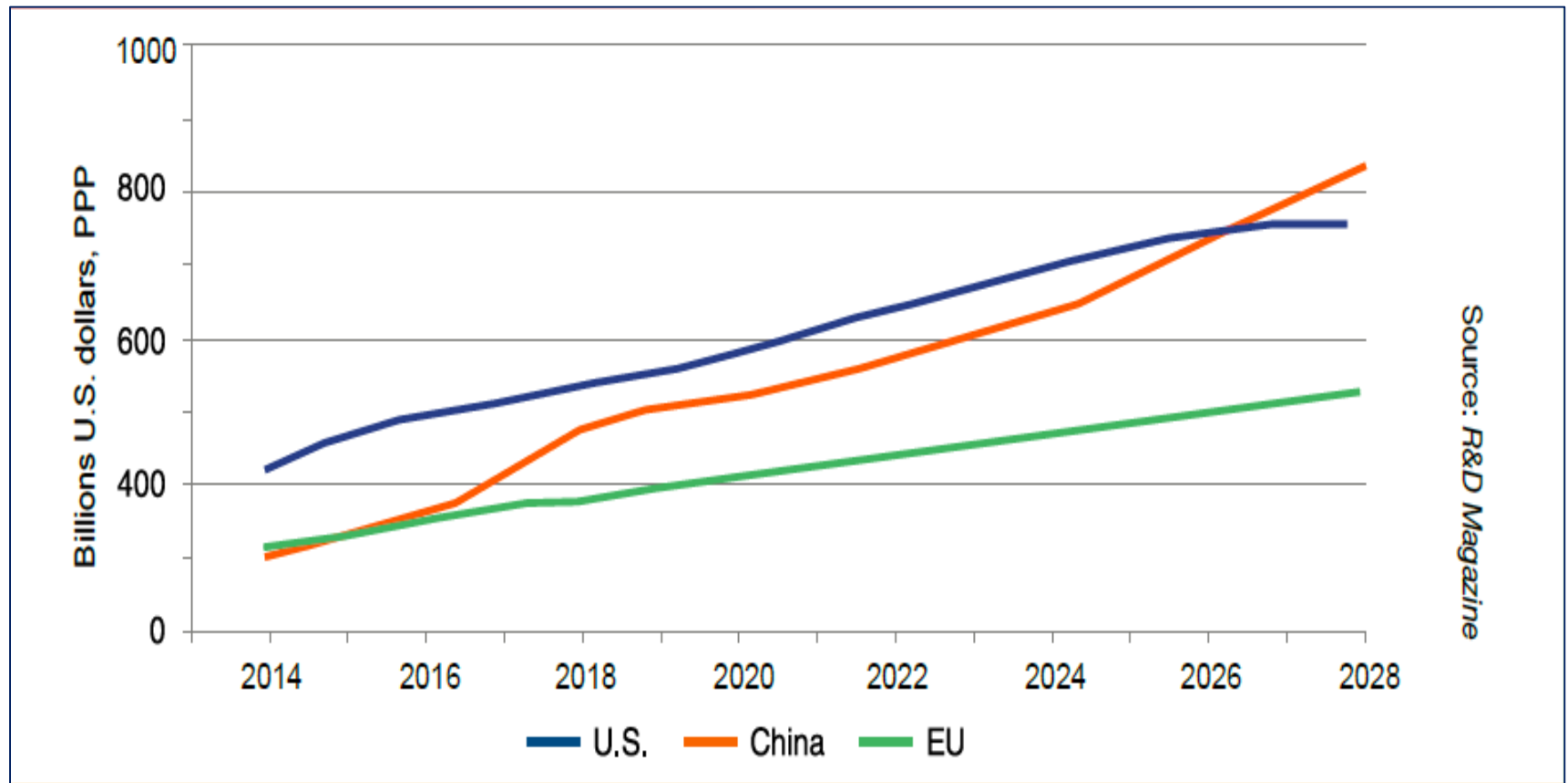
Changes in National R&D Intensity, 2000-2014





Manufacturing Technology – R&D

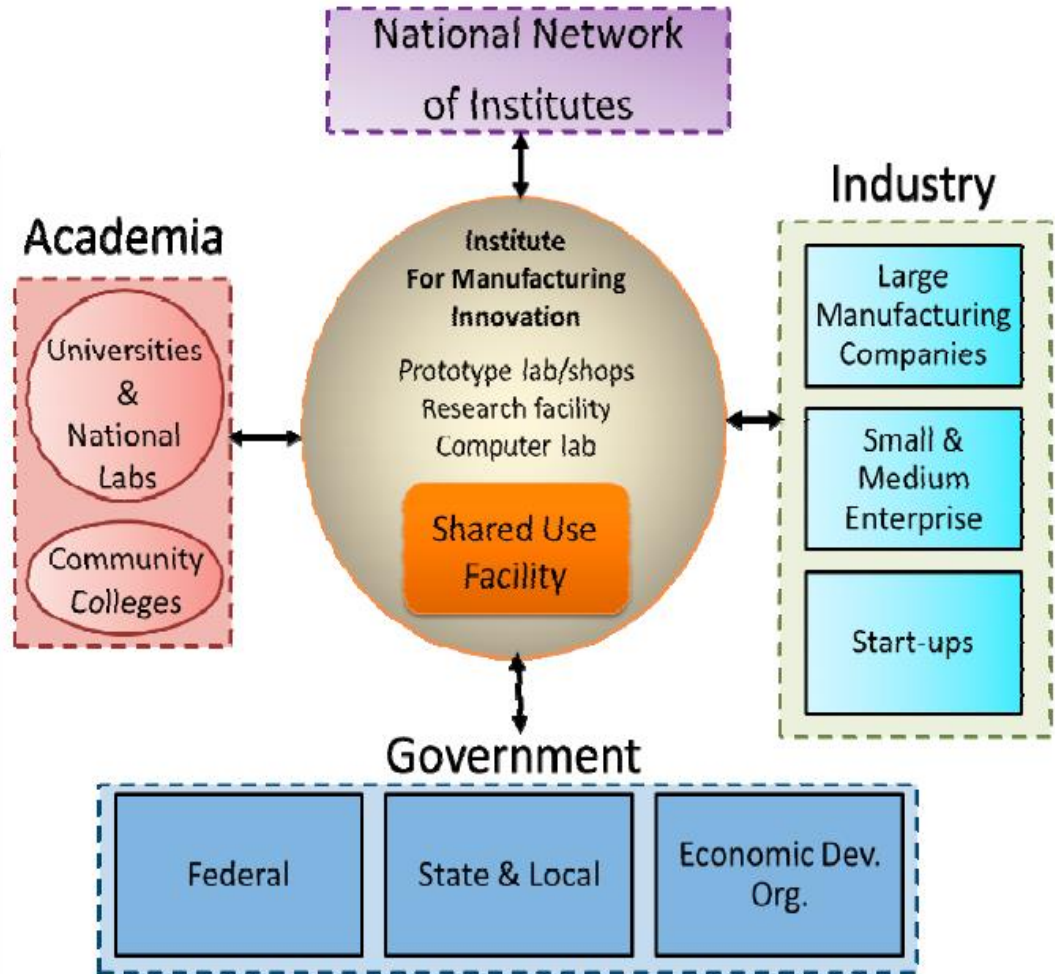
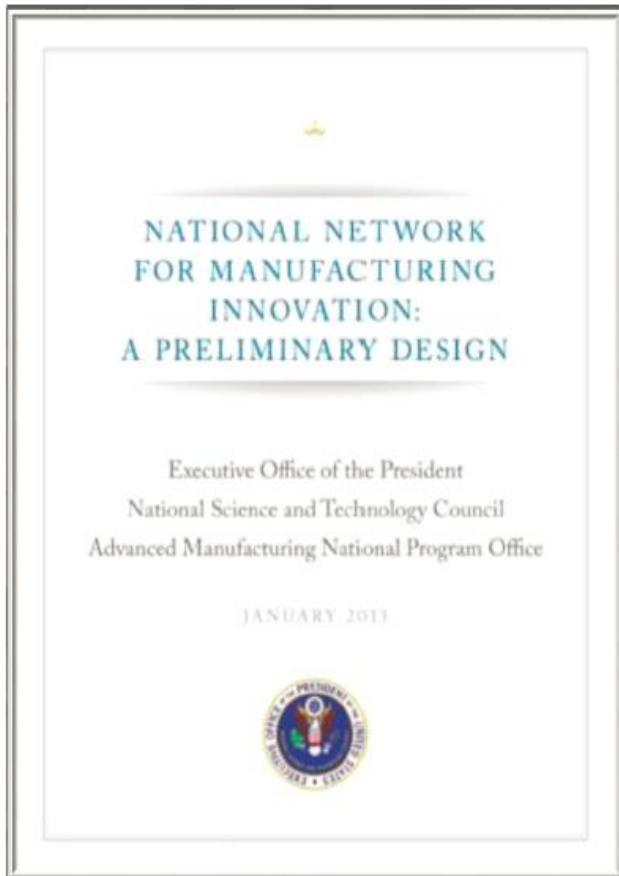
Anticipated Annual R&D Budgets (\$ Billions at PPP), 2014-2028



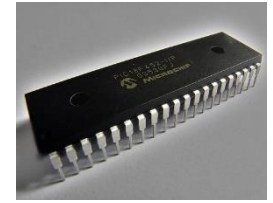
Source: R&D Magazine, 2016 Global R&D Funding Forecast

Public-Private Partnerships for Adv. Manufacturing

White House Report
NNMI Framework Design
January 2013



What America's NNMI Does



Applied Research & Demo projects for

- reducing cost/risk on commercializing new tech.
- Solving pre-competitive industrial problems



Tech Integration - Development of innovative methodologies and practices for supply chain integration



Small/Medium Enterprises

- Engagement with small and medium-sized manufacturing enterprises



Education, technical skills and Workforce development

Education and training at all levels for workforce development



Building Out America's NNMI Network



America Makes
Additive
Manufacturing
DOD-Youngstown OH



DMDII
Digital Mfg & Design
Innovation
DOD – Chicago IL



LIFT
Lightweight &
Modern Metals
DOD – Detroit MI



PowerAmerica
Power Electronics
Manufacturing
DOE – Raleigh NC



IACMI
Adv. Composites
Manufacturing
DOE – Knoxville TN



**Integrated
Photonics**
DOD-
Rochester NY



**Flexible Hybrid
Electronics**
DOD
Solicitation



**Smart
Manufacturing**
DOE
Award TBA

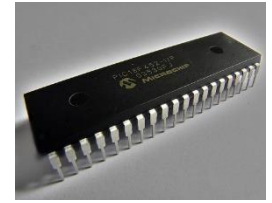


**Revolutionary
Fibers & Textiles**
DOD
Award TBA



**Open-Topic
Solicitation**
NIST
Solicitation

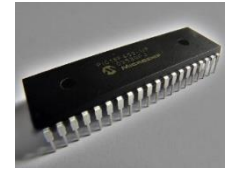
Sematech



- Development and implementation of international nanoelectronics manufacturing roadmaps and standards.
- Coordinates and oversees next-generation research, development and commercialization programs in lithography, interconnects, and metrology.



Better Supporting SME Manufacturers



Australia



Japan



Canada



Korea



Spain



England



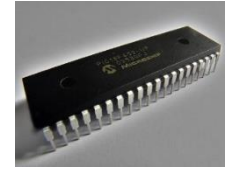
U.S.



Germany



Better Supporting SME Manufacturers



1. Technology Acceleration Programs
 - Promote technology adoption (esp. Industry 4.0)
 - Support tech transfer/commercialization
 - Audit/improve manufacturers' mfg./operational processes

2. Next-Generation Manufacturing Technical Assistance
 - Teach innovation and NPD techniques.
 - Assist with design, energy-efficient mfg., exports.

3. Technology Acceleration Funding Mechanisms
 - Direct funding for R&D activities
 - Innovation vouchers



Trade Policy



- To lead in modern advanced manufacturing, enterprises must be able to source the most sophisticated production equipment, parts, and components from global best-of-breed vendors.
- Market access is no longer “a concession to be granted” in exchange for access to partners’ markets.
- Rather, domestic firms depend on reliable access to imports of world-class goods and services inputs in order to improve their own productivity and competitiveness.
- Leadership in semiconductor production depends on deep interaction with the integrators and end-users of ICs.

Trade Policy



50% of semiconductors consumed in China are used for exported products.



CloudEngine
12800 Series
High-Performance
Core Switches

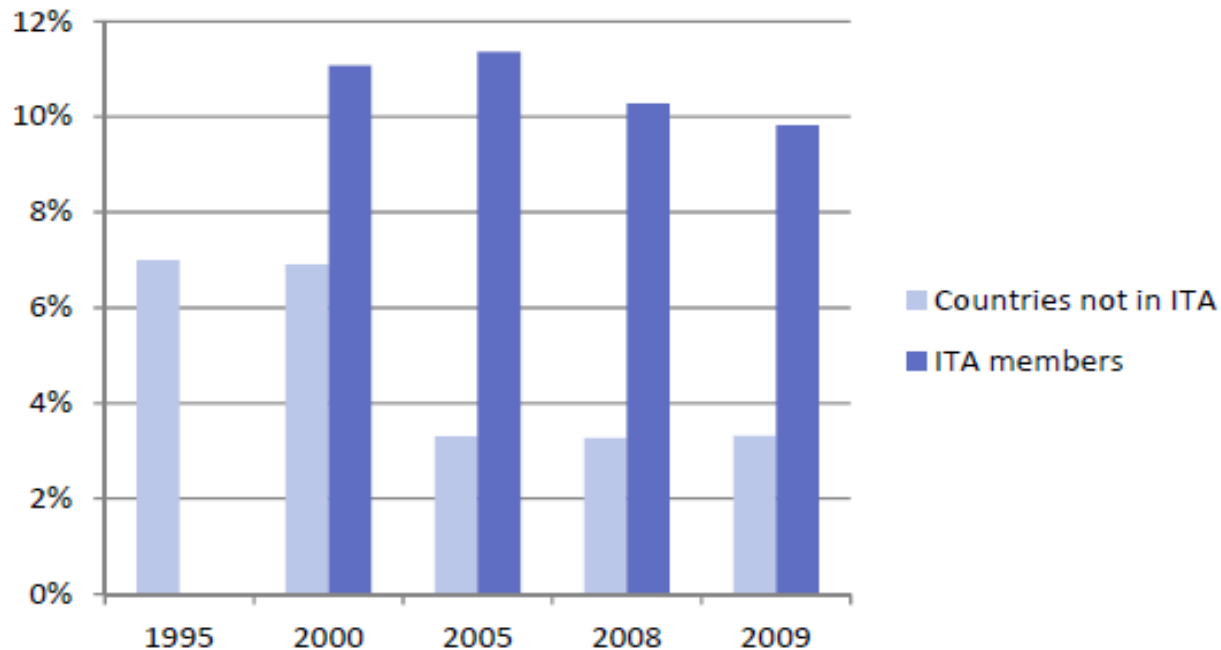


Trade Policy



- Countries not participating in ICT GVCs tend to get left behind.

Relationship Between ITA Membership and Participation in ICT GVCs





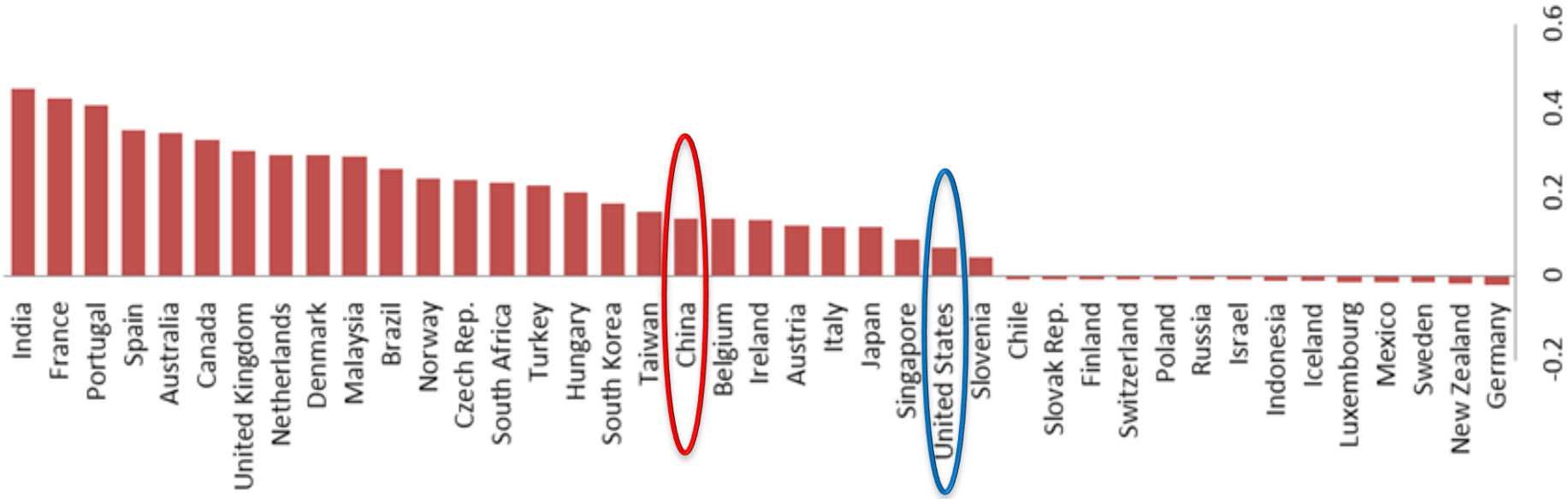
Tax Policy

Leverage tax policy to incent desired enterprise behaviors. China should make even greater use of:

- R&D, including collaborative R&D tax credits.
- Capital equipment investment tax credits.
- Workforce training tax credits



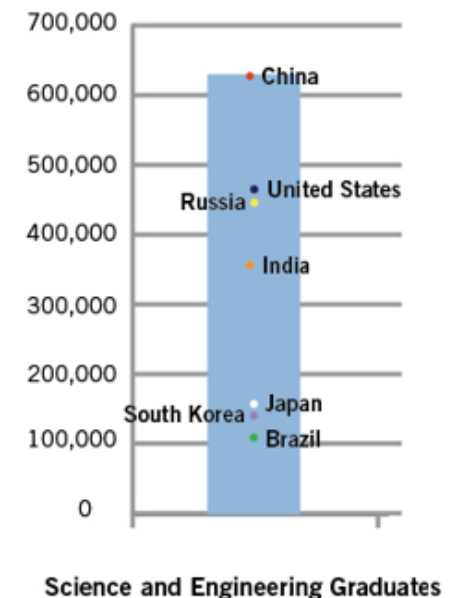
China 19th in OECD for R&D Tax Credits





Mfg. Talent/Workforce

- China will need to enhance the human capital component of the equation to meet Made In China 2025 goals.
- Need to up-skill both the current and future workforce.
- Tax credits for enterprises' investments in worker training; match apprenticeship investments.



“Make In India” : Bold Vision, But Poor Policies



GDP growth figures mask declines in industrial production

Annual % change



Source: Haver Analytics

FT

**Make in India
launched Sept 2014**

“ Make In India” : Bold Vision, But Poor Policies

- Plan is state-heavy with command-and-control—manufacturing zones with special tax, infrastructure, funding, and regulatory settings.
- Failed to address underlying structural issues that make India a difficult place to do business – 130th Doing Business Ranking.
- Key goal was to attract MNCs, but supporting policies discriminate with local content requirements (e.g., solar & national IoT policies).
- Held back by poor political and bureaucratic coordination, buy-in, and ineffective bureaucracy.
- Why is India trying to ride exports to success when global exports are faltering?

Thank You!

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