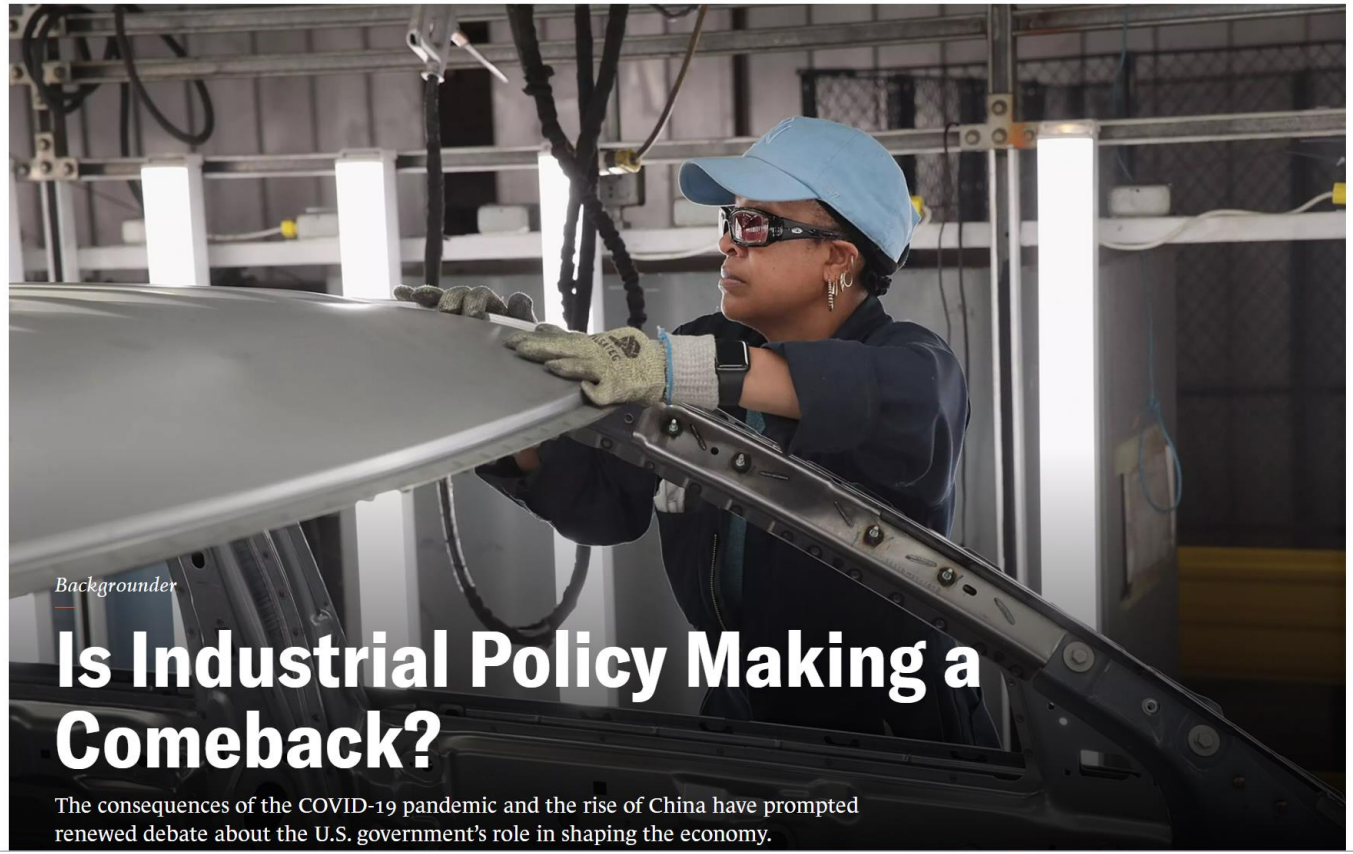
Brazil: A Focus on Industrial Policy for Innovation

Soumitra Dutta, Professor and Dean,
Said Business School



Backgrounder

Is Industrial Policy Making a Comeback?

The consequences of the COVID-19 pandemic and the rise of China have prompted renewed debate about the U.S. government's role in shaping the economy.

Made in China 2025

BACKGROUNDER - June 2018

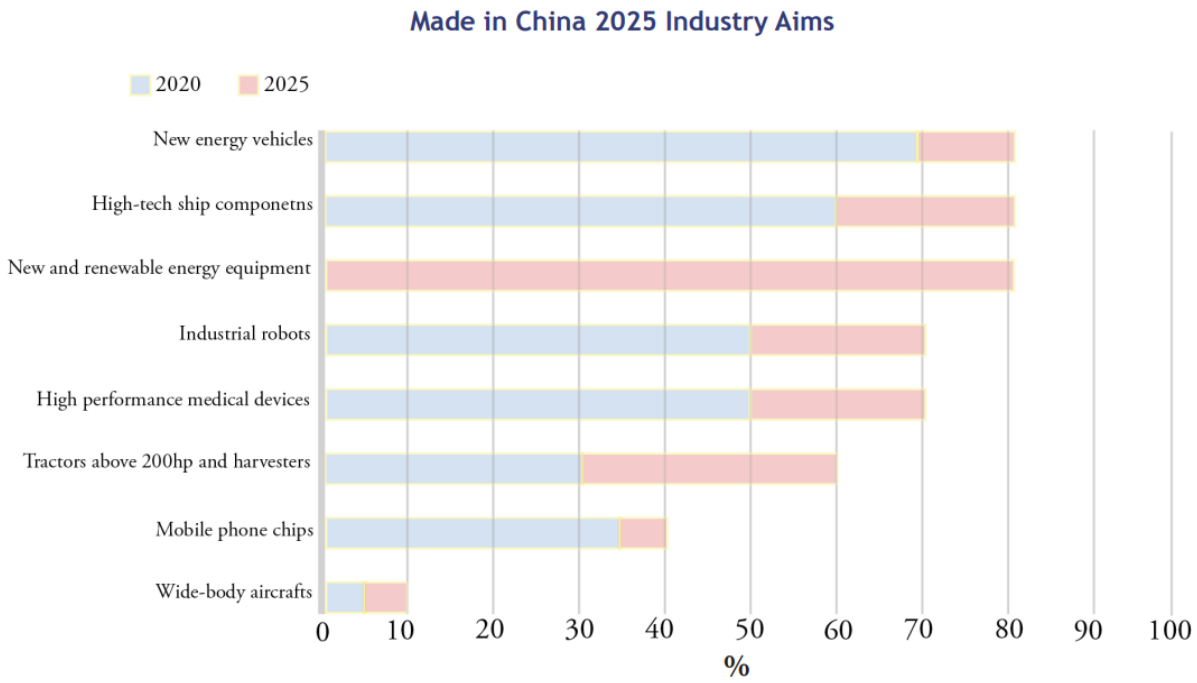
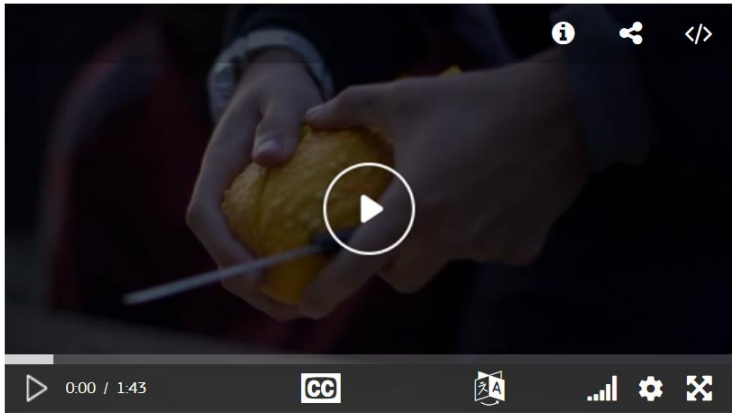


Figure 2: Semi-official targets for the domestic market share of Chinese products

A European Green Deal

Striving to be the first climate-neutral continent

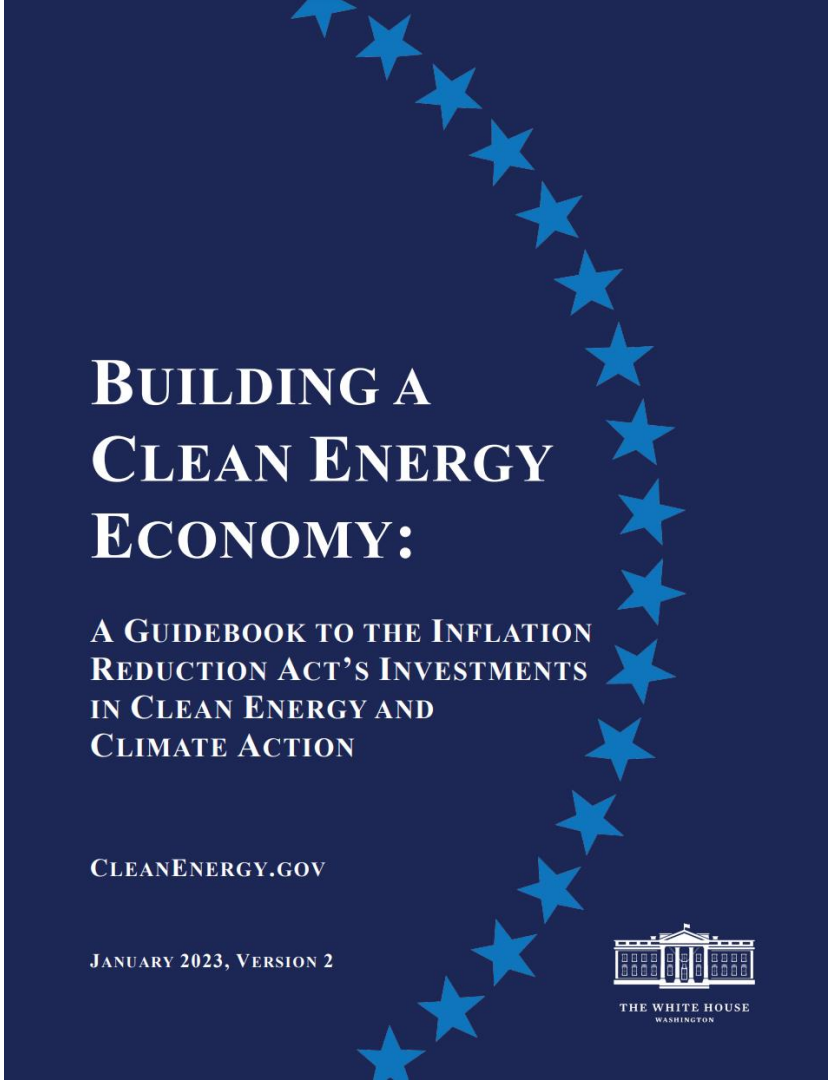


Climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, the European Green Deal will transform the EU into a modern, resource-efficient and competitive economy, ensuring:

- no net emissions of greenhouse gases by 2050
- economic growth decoupled from resource use
- no person and no place left behind

The European Green Deal is also our lifeline out of the COVID-19 pandemic. **One third of the €1.8 trillion** investments from the NextGenerationEU Recovery Plan, and the EU's seven-year budget will finance the European Green Deal.

The European Commission has adopted a set of proposals to make the EU's climate, energy, transport and taxation **policies fit for reducing net greenhouse gas emissions by at least 55% by 2030**, compared to 1990 levels. More information on Delivering the European Green Deal.


BUILDING A CLEAN ENERGY ECONOMY:
A GUIDEBOOK TO THE INFLATION REDUCTION ACT'S INVESTMENTS IN CLEAN ENERGY AND CLIMATE ACTION
CLEANENERGY.GOV
JANUARY 2023, VERSION 2
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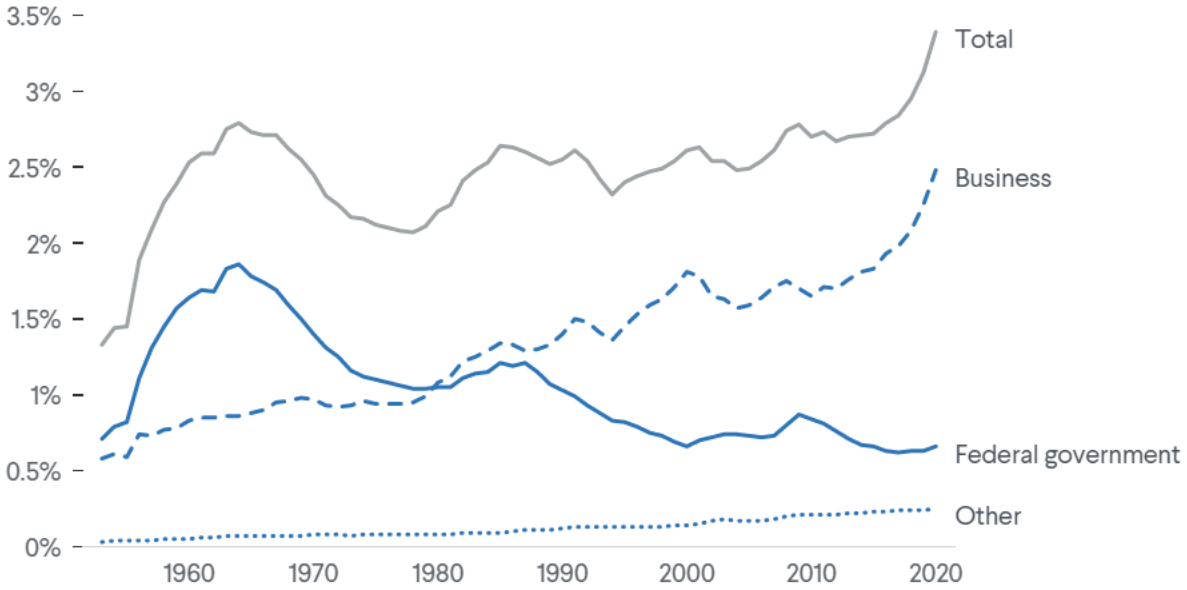
U.S. Government Funding for R&D Has Declined

Funding as a percentage of gross domestic product (GDP)



Note: Data for 2020 includes estimates.

Source: National Science Foundation.

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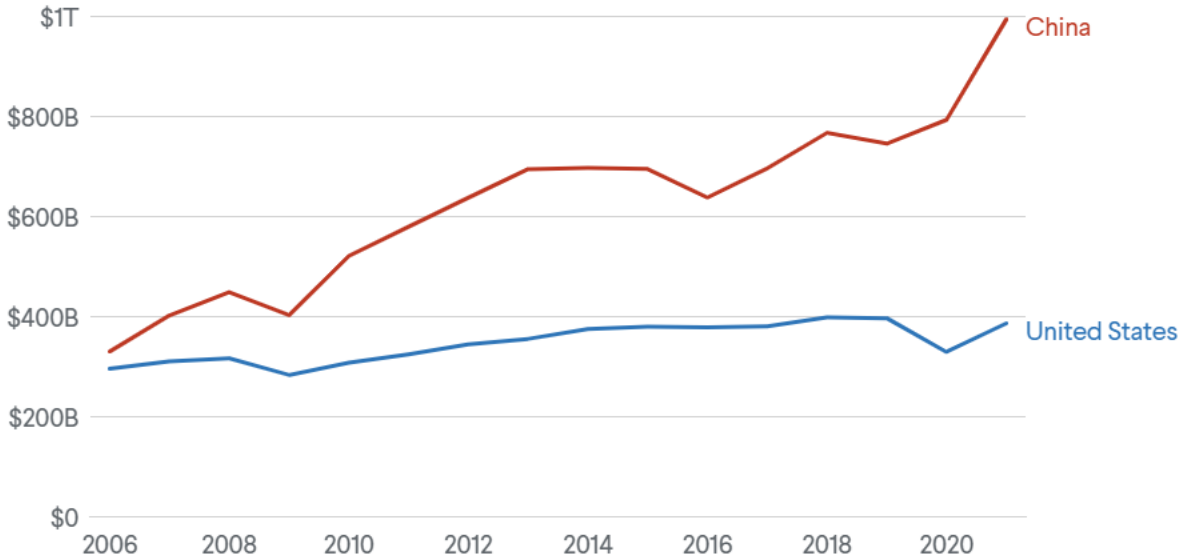
China Has Outpaced U.S. in R&D-Intensive Exports

Exports of highly R&D-intensive goods (current U.S. dollars)



Note: Highly R&D-intensive goods refers to air and spacecraft and related machinery; pharmaceuticals; computer, electronic, and optical products; scientific research and development; and software publishing.

Source: Organization for Economic Cooperation and Development.

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Government

Why the U.S. Needs an Industrial Policy

by Robert B. Reich

From the Magazine (January 1982)

Arguments for an industrial policy

- Driven by hard realities of international competition
- Government already influences industry through procurement, R&D and employment programs
- Government should provide incentives for industry restructuring, especially when driven by technology disruptions
- Government should invest in public goods such as ports and general infrastructure
- Government should respond to industrial strategies of other competing nations
- Not state planning but public policies that complement the strategies of individual corporations

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Lessons from Japan's industrial policy

- Supportive structural features of Japanese economy (such as educated workforce)
- Clear objectives with a focus on foundational commercial technologies (as opposed to military applications)
- Deep coordination between public and private actors
- Success also required foreign competition
- Unsuccessful interventions suppressed domestic competition
- Accusations of political capture and internal bias

Lessons from Europe's industrial policy

- State support for deep coordination between public and private actors
- Successful leverage of existing industrial know-how
- Subsidies alone were not enough; sometimes active measures (such as mandatory targets) were needed
- Stable political support was critical for industrial success
- Some protection for national firms

Lessons from US industrial policy

- Government procurement can create markets for critical early stage technologies
- Public-private R&D consortia can create competitiveness
- High quality talent is essential for successful federal programs
- Close collaboration with industry can help keep pace with rapid technological change
- Government can facilitate public-private-academia collaboration to connect key stakeholders in innovation ecosystem
- Tolerance for risk and failure is essential for success
- Criticism for favoring large companies in consortia

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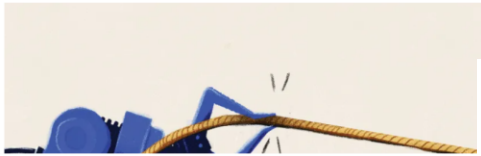
Innovation Power

Why Technology Will Define the Future of Geopolitics

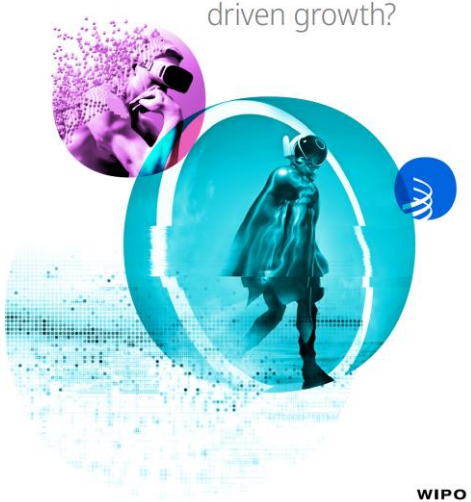
By Eric Schmidt March/April 2023

Published on February 28, 2023



The ability to innovate faster and better—the foundation on which military, economic, and cultural power now rest—will determine the outcome of the great-power competition between the United States and China. For now, the United States remains in the lead. But China is catching up in many

The main reason innovation now lends such a massive advantage is that it begets more innovation. In part, it does so because of the path dependency that arises from clusters of scientists attracting, teaching, and training other great scientists at research universities and large technology companies. But it also does so because innovation builds on itself. Innovation relies on a loop of invention, adoption, and adaptation—a feedback cycle that fuels yet more innovation. If any link in the chain breaks, so, too, does a country's ability to innovate effectively.



Global Innovation Index 2022

What is the future of innovation-driven growth?

WIPO

Mid to End 20st century
21st century

Digital Age wave

ICT installation and advanced ICT adoption

Phase 1
Diffusion of ICT network and hardware ICT installation

Phase 2
Adoption of advanced ICT solutions, e.g., AI, digital transformation

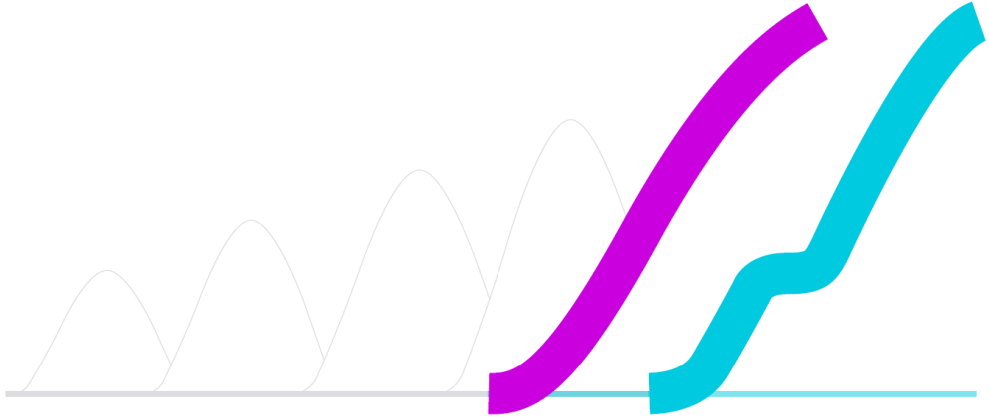
21st century

Deep Science wave

Major scientific breakthroughs in hard sciences make a real world impact

Phase 1
Scientific breakthroughs in bio, nano-tech, health, new materials

Phase 2
Application of breakthroughs in health, agri-food, clean tech, transport and others



Start 19th century
Steam engine, textiles

Mid 19th century
Railroad, steel, electricity

Start 20st century
Chemicals and pharma, oil, automobiles, nuclear power

Mid 20st century
Electronics, aviation, mass and just-in-time production

Brazil: A lost decade

- For Latin America. Brazil, the 2014-2023 decade is much worse than the "lost decade" of the debt crisis between 1980 and 1990.
- In Latin America, GDP grew only 0.8% per year from 2014 to 2023, in sharp contrast to 2% per year from 1980 to 1990. In the case of Brazil, GDP grew by 1.4% per year between 1980-1990 and only 0.02% per year between 2014-2022
- In Brazil, gross fixed capital formation grew by an average of 3.2% per year between 1981-1990, and only 0.5% per year between 2014-2022 – below the depreciation replacement rate!!!
- After 2014, the manufacturing industry rapidly lost its share of GDP in Latin America and Brazil. Brazilian manufacturing fell from the 10th position in the world ranking in 2010 to the 16th position in 2019.

BRAZIL: Compound Average Growth Rates (CAGR)
(selected periods)

	1980-1990	2003-2013	2014-2022
GDP	1.43	3.65	0.02
Total Industry	1.17	2.97	-1.17
Extractive Industry	6.20	3.01	1.24
Ind. Manufacturing.	0.03	2.45	-1.40

Source: prepared by the author based on IBGE and Ipeadata.

Note: "Public Utilities" are included in the concept of Total Industry

Source: Luciano Coutinho, presentation at Cornell Tech, 28 April 2023

Brazil's industrial policy

- Brazil has used industrial policies more successfully as compared to other Latin American nations
- Brazil needs to leverage key areas of strength such as bio diversity and the bio economy
- Brazil has fallen behind compared to international competition in key domains of high technology and the energy transition
- Brazil needs to focus on rapid progress in key domains: energy, climate, health and digital
- Brazil can learn from Europe, Japan and USA

Thank you

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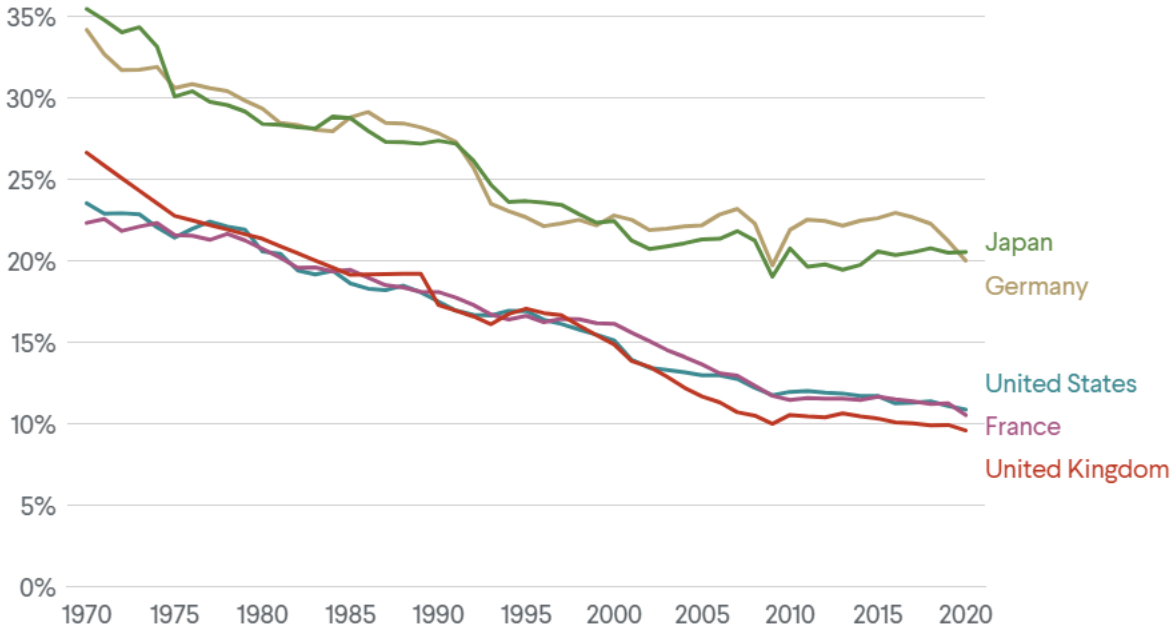
Manufacturing's Share of GDP Has Declined in Advanced Economies

Manufacturing output as a percentage of gross domestic product (GDP), selected countries



Source: UN Department of Economic and Social Affairs.

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