



CHAPTER SIXTEEN

**THE GLOBAL BATTLE FOR INDUSTRIAL DOMINANCE:
CHINA, AMERICA, AND EUROPE IN THE 21ST CENTURY**

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*The greatest danger in times of turbulence is not the turbulence;
it is to act with yesterday's logic.*

– Peter Drucker, *Managing in Turbulent Times*, 1980

Abstract

The resurgence of industrial policy is reshaping the global economic landscape. Driven by geopolitical competition, technological disruption, and the need for national resilience, countries are adopting diverse strategies to secure their economic futures. This chapter examines the evolving industrial policies of China, the United States, and Europe, highlighting their distinct approaches and the implications for global trade, innovation, and technological leadership. From China's state-led model to the U.S. focus on targeted investments and Europe's "de-risking" strategy, the competition for industrial dominance is intensifying. The chapter also explores the role of international collaborations, such as the Quad and AUKUS, in shaping a new era of industrial policy.

**Strategic Industrial Policy:
A New Three-Way Global Race**

The global economic landscape is undergoing a profound transformation. Nations can no longer rely solely on the invisible hand of the market to determine their economic futures. The resurgence of industrial policy, particularly strategic industrial policy, signals a shift in global economic governance, driven by geopolitical rivalry, technological disruptions, and the pressing need for national resilience. What was once considered a relic of past

economic strategies has re-emerged with renewed vigor, marking a significant departure from the laissez-faire approach that dominated recent decades.¹ This shift raises critical questions about the role of the state in shaping economic outcomes and national security priorities. What defines industrial policy, and how does it differ from its strategic counterpart?

At its core, industrial policy refers to targeted government interventions designed to stimulate specific sectors of the economy.² This can include directing funding toward specific research and development (R&D), allocating resources to key industries, and providing incentives—such as subsidies, tax breaks, and land grants³—to drive growth. Governments actively reshape regulations, transforming the “sectoral structure of production” to prioritize industries deemed vital for national economic development or technological advancement.⁴

Strategic industrial policy, however, goes a step further. It represents a deliberate set of policies aimed at cultivating “national champions”—industries considered essential not only for economic competitiveness but also for broader social outcomes and national security.⁵ This strategic approach focuses on fortifying critical sectors such as technology, defense, and energy, ensuring they are robust, resilient, and capable of enhancing a nation’s strategic positioning on the global stage.

This chapter will explore the driving forces behind the resurgence of strategic industrial policy, analyze the varying approaches taken by major economic powers, and assess the broader implications for the future of global economic governance.

Catalysts for the Resurgence of Industrial Policy

The resurgence of industrial policy is not a fleeting trend but a fundamental shift, driven by a confluence of powerful forces reshaping the global order.⁶ Key catalysts have exposed

vulnerabilities, heightened competition, and created new imperatives for national action:

1. *GEOPOLITICAL TENSIONS AND GREAT POWER COMPETITION*: The rise of China as an economic and technological powerhouse has upended the global order. Coupled with escalating military conflicts and geopolitical tensions, this shift has shattered the illusion of a purely cooperative international system, compelling nations to secure their strategic industries and reduce dependencies on potential adversaries.⁷
2. *SUPPLY CHAIN FRAGILITY*: The COVID-19 pandemic revealed the fragility of global supply chains, as severe shortages of essential goods—from medical equipment to microchips—forced nations to confront the risks of overreliance on foreign production.⁸ This experience has spurred a push for greater domestic manufacturing capacity and regionalized production networks.
3. *TECHNOLOGICAL DISRUPTIONS*: Rapid advancements in artificial intelligence (AI), quantum computing, biotechnology, robotics, electric vehicles, and renewable energy are redefining economic and military power.⁹ Nations are increasingly using industrial policy to accelerate domestic innovation, capture emerging markets, and ensure they do not fall behind in this technological race.
4. *CLIMATE CHANGE IMPERATIVE*: The urgent need to transition to a low-carbon economy has further propelled the revival of industrial policy. Governments are actively supporting green technologies, fostering sustainable manufacturing practices, and promoting renewable energy to mitigate climate risks and secure a competitive edge in the burgeoning green economy.¹⁰

These dynamics have triggered a strategic contest among China, the United States, and Europe, as each seeks to secure a leadership position in critical sectors that will define global trade, technology, and economic stability. This chapter will examine how these major powers are adapting their industrial strategies to meet the challenges of a rapidly changing global landscape and the implications of their approaches for international cooperation and competition.

Diverging Paths: Industrial Policy in a Multipolar World

The renewed emphasis on industrial policy has reshaped global competition, with China, the United States, and Europe charting distinct courses to assert their influence in key strategic sectors. This intensifying race, driven by evolving geopolitical dynamics and economic priorities, has significant consequences for international trade, innovation, and the development of emerging technologies.

China's State-Led Approach

A strong, state-led model, exemplified by its ambitious “Made in China 2025” initiative, defines China’s industrial policy.¹¹ Launched in 2015, this plan aims to elevate China to a global manufacturing superpower by prioritizing ten strategic sectors, including advanced information technology, robotics, aerospace, and new energy vehicles.¹² Beijing’s strategy relies on substantial government subsidies, targeted R&D investments, and the development of “national champions”—state-supported enterprises designed to dominate domestic and international markets.¹³

While this approach has been successful in rapidly advancing China’s technological capabilities, it has also raised concerns about unfair competition and market distortions. Critics argue that China’s reliance on subsidies and other state interventions creates an uneven playing field, disadvantaging foreign competitors and prompting calls for tighter trade regulations and export controls.

Europe's De-risking Strategy

The European Union (EU) is taking a different path, emphasizing “de-risking” to minimize strategic vulnerabilities and reduce dependencies. This strategy involves diversifying supply chains, enhancing technological sovereignty, and strengthening domestic industries.¹⁴ While the EU acknowledges the critical importance of green technologies and digital innovation, its primary objective is to mitigate risks stemming from overreliance on China.

This approach, championed by European Commission President Ursula von der Leyen, seeks to decouple Europe’s critical supply chains from China and safeguard key industries against aggressive competition.¹⁵ Europe, like the rest of the world, has become increasingly concerned about the “strong push to make China less dependent on the world and the world more dependent on China.”¹⁶ By promoting technological independence and encouraging regional collaboration, Europe aims to build a more resilient economic ecosystem that can withstand external pressures.

America's Targeted Investment Strategy

The United States has adopted a strategy characterized by targeted investments in sectors deemed vital for national security and economic competitiveness.¹⁷ This approach focuses on identifying areas where private industry may lack the necessary competitive edge and deploying state resources to stimulate investment and innovation. Recent legislative efforts, such as the CHIPS and Science Act and the Inflation Reduction Act, reflect this strategy, providing significant funding to boost domestic semiconductor production and clean energy technologies.

Washington’s approach seeks to harness the strengths of its private sector while addressing market inefficiencies and bolstering strategic industries.¹⁸ By incentivizing domestic production and R&D in key areas, the United States aims to minimize reliance on foreign supply chains, assert technological leadership, and maintain

its competitive position in the global marketplace.¹⁹ This focus on strategic industrial policy echoes approaches adopted by nations throughout history, demonstrating the enduring relevance of government intervention in shaping economic outcomes.

The Evolution of Industrial Policy: From Mercantilism to the Modern Era

Throughout history, nations have sought to shape their economic destinies and secure their place in the global order. Industrial policy, the strategic use of government intervention to guide economic development, has been a constant tool in this pursuit, evolving alongside the changing dynamics of the global landscape.

Early Examples

Early examples of industrial policy can be traced back to the mercantilist policies of European powers in the 17th and 18th centuries. Seeking to maximize exports and accumulate wealth, nations like Britain and France implemented policies such as the Navigation Acts, which restricted colonial trade to benefit the mother country, and chartered companies like the French East India Company, which enjoyed state-granted monopolies and subsidies.²⁰ In the 19th century, the United States employed similar tactics to protect its nascent industries, using tariffs to shield domestic manufacturers and land grants to encourage railroad construction, fostering growth in sectors like steel and manufacturing. These early interventions laid the foundation for future industrial policy practices, which would take on new urgency and complexity in the 20th century.

The Cold War and the Space Race

The 20th century witnessed a resurgence of industrial policy, particularly in the aftermath of World War II. The Cold War intensified this trend as the United States and the Soviet Union fiercely competed for technological supremacy. This rivalry fueled

advancements not only in space research and weapons development but also in fields like nuclear energy, aerospace, and computing. The United States established institutions like the Office of Scientific Research and Development (OSRD) during World War II, and later the National Science Foundation (NSF) and the Defense Advanced Research Projects Agency (DARPA) to drive innovation and maintain its technological edge.

A key turning point in this era was the Soviet Union's launch of Sputnik I in 1957.²¹ This event, which triggered the "Space Race," underscored the strategic importance of science and technology and prompted the United States to invest heavily in research and education. This "Sputnik moment" not only fueled the Space Race but also spurred a broader wave of investment in science and technology education in the United States. It serves as a potent reminder of how external challenges can catalyze national action and drive industrial policy shifts, much similar to what China's technological rise is doing today.

Post-War Industrialization

Following the Cold War, nations continued to employ industrial policy to achieve various economic and strategic goals. Japan's remarkable economic rise was fueled by a strategic approach that nurtured key industries like electronics and automobiles. This involved a focus on export-led growth, significant investments in R&D, and a close collaboration between the government and the private sector, often orchestrated by its Ministry of International Trade and Industry (MITI).²² This model, often referred to as "developmental state capitalism," proved highly successful due to factors such as targeted investments, export promotion, and strong state capacity.²³ However, it is important to note that this model also has potential limitations, including the risk of government overreach or cronyism. This model was subsequently adopted by other East Asian economies, including South Korea and Taiwan, with similar success.

However, not all industrial policies have been successful. Import-substitution strategies, prevalent in many Latin American and African countries during the mid-20th century, often led to inefficient industries and hindered economic growth.²⁴ For example, Argentina's attempts to achieve self-sufficiency through import substitution resulted in high costs, limited innovation, and, ultimately, economic stagnation. Other countries, such as Chile, Brazil, and the Gulf States, also employed industrial policies to develop their natural resource sectors and heavy industries. However, the success of these policies varied depending on factors such as trade openness and the effectiveness of government interventions. The varying outcomes of these industrial policies underscore the importance of careful planning, effective implementation, and adaptability to changing global circumstances.

The Modern Context

Industrial policy aims have evolved over time, reflecting changing global dynamics and national priorities. Today, industrial policy is increasingly driven by the need to compete in a multipolar world, secure critical technologies, and enhance national resilience in the face of global challenges. Much like the "Sputnik moment" spurred U.S. action during the Cold War; China's technological rise presents a new challenge. However, the United States faces a unique obstacle this time: its deep entanglement in China's manufacturing ecosystem, which could hinder its ability to respond effectively. This entanglement makes it difficult for the United States to decouple from China's supply chains or impose restrictions without significant economic consequences.

This challenge, along with other contemporary factors, is shaping the new era of industrial policy competition. While industrial policy offers a powerful tool for nations to achieve strategic goals, it also carries potential risks, such as the potential for government overreach, market distortions, and trade conflicts.²⁵ Navigating these complexities will require careful planning,

effective implementation, and a commitment to international cooperation.

Protectionism and Industrial Policy: A Delicate Balance

While free market principles advocate minimal government intervention, the reality is that states often play an active role in shaping their economies. However, excessive protectionism, such as high tariffs or trade barriers, can distort markets, stifle competition, and ultimately hinder economic growth. Finding the right balance between supporting strategic industries and maintaining an open and competitive market is a key challenge for policymakers in the 21st century.

China's Protectionist Approach

China has been a master of utilizing protectionist measures to fuel its economic rise. While often justified under the guise of “infant industry protection,” China has employed a range of tactics to shield its domestic industries from international competition and gain an unfair advantage in the global markets.²⁶ These tactics include:

- *HIGH TARIFFS* on imported goods, making them more expensive and less competitive compared to domestic products.
- *NON-TARIFF BARRIERS*, such as complex regulations and product standards that are difficult for foreign companies to meet.
- *FORCED TECHNOLOGY TRANSFER*, where foreign companies are required to share their technology with Chinese partners in order to access the Chinese market.
- *SUBSIDIES* and preferential treatment for domestic firms, giving them an artificial advantage over their foreign competitors.

- *CURRENCY MANIPULATION* to keep its exports artificially cheap, making them more attractive to buyers in other countries.

These measures have allowed Chinese companies to thrive in a wide range of sectors, from steel and manufacturing to high-tech industries like electronics and renewable energy.

Impact on Global Trade and Economic Order

China's protectionist policies have had a profound impact on the global economic order, contributing to several challenges:

- *TRADE IMBALANCE*: China's large trade surplus with many countries has led to concerns about deindustrialization and job losses in those nations.
- *LACK OF RECIPROCITY*: Foreign companies often face significant barriers to entering the Chinese market, while Chinese companies enjoy relatively open access to markets abroad. This lack of reciprocity has fueled frustration and calls for a more level playing field.
- *MARKET DISTORTIONS*: China's subsidies and other support for its domestic industries have distorted global markets, making it difficult for companies in other countries to compete fairly.

As U.S. National Security Advisor, Jake Sullivan has noted, China's "non-market economy" poses significant challenges to the international economic order.²⁷ Beijing's continued use of subsidies and protectionist measures undermines fair competition and creates an uneven playing field.

The Geopolitical Dimension

China's protectionism is not merely an economic strategy; it is a tool for achieving geopolitical goals. By dominating key industries and controlling critical supply chains, China aims to increase its global

influence and leverage. This strategy has fueled anxieties among other nations, who are increasingly wary of their dependence on China and the potential vulnerabilities it creates. China's pursuit of technological dominance, as outlined in its "*Made in China 2025*" plan, has further heightened these concerns, sparking global competition for industrial leadership.²⁸

Finding the Right Balance

While protectionism can be a tempting tool for governments seeking to promote domestic industries, its effectiveness is often limited in a globalized economy. Excessive protectionism can lead to retaliation and trade wars, harming economic growth, and it often stifles domestic innovation.²⁹ The challenge for policymakers is to find the right balance between supporting strategic industries and maintaining an open and competitive market. This involves using targeted measures to support key industries while avoiding broad-based protectionism, working with allies and partners to address unfair trade practices and promote a level playing field, and investing in education, infrastructure, and innovation to enhance competitiveness and reduce reliance on protectionist measures.

In a world of intensifying geopolitical competition, the delicate balance between protectionism and industrial policy will continue to be a critical issue for nations navigating the complexities of the 21st-century economy.

China's Industrial Policy: A Strategic Evolution for Global Power

China's industrial policy has undergone a dramatic transformation since the founding of the People's Republic in 1949. Initially focused on central planning and state control, it evolved into a sophisticated strategy for technological dominance and global economic leadership.

Early Stages (1949-1978)

In the early decades under Mao Zedong, China's industrial policy was characterized by a Soviet-style command economy.³⁰ The state controlled all the major industries, with a focus on heavy industries like steel and manufacturing, often at the expense of consumer goods. This approach, coupled with political campaigns like the Great Leap Forward, which aimed for unrealistic production targets, and the Cultural Revolution, which disrupted education and economic activity, led to significant inefficiencies, misallocation of resources, and, ultimately, limited economic progress. The lack of market mechanisms and incentives stifled innovation and hindered productivity. This period highlighted the limitations of a purely state-controlled approach to industrial development, demonstrating the need for a more balanced approach that incorporates market forces. This realization paved the way for the transformative reforms initiated by Deng Xiaoping in 1978.

Reform and Opening (1978-2006)

Following Mao's death, Deng Xiaoping initiated a period of economic reform and opening up. China gradually transitioned toward a more market-oriented system, allowing for private enterprise, foreign investment, and greater economic reform.³¹ While industrial policy was less formalized during this era, the government still played a significant role in guiding economic development. For instance, it established Special Economic Zones to attract foreign investment and technology, providing tax incentives and streamlined regulations to entice foreign businesses. This led to significant growth in sectors like electronics and telecommunications, with companies like Huawei and ZTE emerging as global players. The government also provided subsidies and tax breaks to key industries, such as electronics and textiles, and promoted export-oriented growth through currency policies and trade agreements.

This period saw remarkable economic expansion, averaging nearly 10% annual GDP growth, and lifted hundreds of millions of people out of poverty, demonstrating the power of market-oriented reforms combined with strategic government support.³² However, it also brought challenges like widening income inequality between rural and urban areas, severe environmental degradation due to rapid industrialization, and a growing dependence on foreign technology in critical sectors.

The Rise of Strategic Industrial Policy (2006-Present)

Since 2006, China's industrial policy has taken a more strategic and assertive turn, driven by the need to compete in a globalized economy and achieve technological independence. This shift is characterized by a focus on innovation, the development of "national champions," and the pursuit of dominance in key high-tech sectors.

This new era was marked by initiatives such as the *Medium and Long Term Program of Science and Technology* (MLP) in 2006, which emphasized "indigenous innovation" and funded major projects in strategic sectors like biotechnology and renewable energy.³³ As leading scholar Barry Naughton argues, China began investing in industrial policies on a "massive and unprecedented scale" after 2010.³⁴ This period saw the emergence of key initiatives like the "*Decision on Accelerating Strategic Emerging Industries*" in 2010,³⁵ which aimed to promote the growth of seven strategic sectors, and, most notably, the "Made in China 2025" plan in 2015. "Made in China 2025" laid out a bold vision for China to become a global leader in ten key high-tech sectors, including advanced information technology, robotics, aerospace, and new energy vehicles, by achieving self-sufficiency in core technologies and capturing significant global market share.³⁶

More recently, China has adopted the "dual circulation" strategy, which aims to reduce reliance on foreign technology and

markets while strengthening domestic demands and innovation.³⁷ This approach, driven by concerns about geopolitical tensions and potential decoupling from Western economies, involves boosting domestic consumption, promoting indigenous innovation, and developing self-reliant supply chains. This strategy reflects China's growing confidence in its own capabilities and its desire to shape the global economic order on its own terms.

Impact and Implications

China's industrial policy has been instrumental in its rapid economic growth and technological advancement, transforming the nation into a global manufacturing powerhouse and a major player in high-tech industries. However, it has also raised concerns about unfair competition, market distortions, and intellectual property (IP) theft. Critics argue that China's state-led approach creates an uneven playing field, giving its companies an unfair advantage through subsidies, preferential treatment, and forced technology transfer.³⁸ These concerns have led to trade disputes, such as the U.S.-China trade war, and efforts by other countries to diversify their supply chains and reduce their reliance on China. The international community is increasingly grappling with how to respond to China's assertive industrial policies and maintain a level playing field in the global economy.

Made in China 2025:

Ambitions and Anxieties in the Global Tech Race

When China unveiled its "Made in China 2025" plan, it signaled a bold ambition: to become the world's leading technological superpower. This comprehensive strategy, launched in 2015, aims to rapidly enhance China's capabilities across ten key high-tech sectors, marking a shift from low-cost manufacturing to high-value-added production. The implications for the global economic landscape are profound, as "Made in China 2025" has sparked

intense competition and raised concerns about China's growing economic and geopolitical influence.

Key Goals and Objectives

The core objectives of "Made in China 2025" are to:³⁹

- *ACHIEVE SELF-SUFFICIENCY*: Reduce dependence on foreign technology and achieve self-reliance in critical sectors.
- *DOMINATE KEY INDUSTRIES*: Establish leadership in high-tech industries, such as advanced information technology, robotics, aerospace, and new energy vehicles.
- *CAPTURE GLOBAL MARKET SHARES*: Increase domestic production of core components and materials to over 70% and secure a significant share of the global market.
- *UPGRADE MANUFACTURING CAPABILITIES*: Move up the value chain from low-cost, labor-intensive manufacturing to high-value, technology-driven production.
- *PROMOTE INNOVATION*: Foster innovation and technological breakthroughs to drive economic growth and national strength.

These objectives reflect China's ambition to not only become a global manufacturing powerhouse, but also to lead in the development and application of advanced technologies. By achieving these goals, China aims to secure its long-term economic prosperity, enhance its geopolitical influence, and shape the future global order.

"Made in China 2025" and the "Dual Circulation" Strategy

"Made in China 2025" is closely aligned with China's broader "dual-circulation" strategy,⁴⁰ which seeks to boost domestic consumption and promote indigenous innovation while maintaining engagement in global trade.⁴¹ This strategy reflects a shift toward

greater self-reliance and a desire to reduce vulnerabilities to external pressures, particularly amid rising geopolitical tensions and potential decoupling from Western economies. By strengthening its domestic market and technological capabilities, China aims to create a more resilient and independent economy that is less susceptible to external shocks.

International Response and Concerns

The initiative has raised significant concerns globally, with other nations viewing it as a challenge to fair competition and the principles of global trade. These concerns stem from a variety of factors:

- *UNFAIR TRADE PRACTICES*: Concerns about subsidies, market access restrictions, and compulsory joint ventures that disadvantage foreign companies.
- *INTELLECTUAL PROPERTY THEFT AND CYBER ESPIONAGE*: Allegation of IP theft, industrial espionage, and aggressive technology transfer requirements, which have heightened tensions.
- *CURRENCY MANIPULATION AND MARKET DISTORTIONS*: Fears that China's policies are designed to support state-backed companies in dominating global markets, from electric vehicles to semiconductors.⁴²

To counter these practices, several countries have implemented export control measures, tightened regulations on foreign investment, and invested in domestic industries to enhance their competitiveness. The United States, for example, launched a trade war with China, imposing tariffs on billions of dollars' worth of Chinese goods and increased scrutiny of Chinese investments in sensitive technologies. However, countering China's strategy while maintaining international cooperation and open markets remains a significant challenge.

Implications for the Future

“Made in China 2025” has significantly impacted the global economic landscape, accelerating the competition for technological dominance and prompting other countries to re-evaluate their industrial policies. The long-term implications of this initiative will depend on how effectively other nations can respond and whether China can achieve its ambitious goals while addressing the concerns of the international community. The success or failure of “Made in China 2025” will have profound consequences for the future of global trade, innovation, and geopolitical power.

**Countering China:
New Strategies for Industrial Competitiveness**

Global industrial competition is at a critical juncture. Nations are confronting the challenge of China’s dominance in key sectors, particularly technological innovation and manufacturing. China’s comprehensive control over raw materials and finished goods enables it to command entire supply chains, prompting a worldwide reassessment of industrial strategies. The challenge is magnified by growing technological dependence on China, vulnerabilities in global supply chains, and the erosion of manufacturing capabilities in many developed countries.

Responding to the Challenge

The United States and Europe have initiated various strategies to strengthen their industrial competitiveness and counterbalance China’s influence. These efforts focus on substantial investments to bolster domestic industries, particularly high-priority sectors.

1. *THE U.S. APPROACH.* The United States is adopting a targeted investment strategy to reclaim leadership in critical sectors. Key initiatives include:
 - *CHIPS and Science Act:* This act allocates billions of dollars to support domestic semiconductor productions,

aiming to revitalize the U.S. semiconductor industry and reduce reliance on foreign suppliers.

- *Inflation Reduction Act*: This act incentivizes the development of clean energy technologies and seeks to reduce reliance on China for critical minerals, fostering a more sustainable and secure energy future.
- *Infrastructure Investment and Jobs Act*: This act invests in infrastructure projects essential for a modern manufacturing sector, including transportation, energy, and communications networks.

These measures aim to revitalize domestic industries, create well-paying jobs, and build more resilient supply chain networks.

2. *THE EUROPEAN STRATEGY*: Europe is focused on “de-risking” its economy by reducing dependence on Chinese manufacturing and promoting strategic autonomy. This involves:

- *Diversifying Supply Chains*: Reducing reliance on China by seeking alternative sources for critical materials and components.
- *Investing in Critical Technologies*: Supporting R&D in key technologies, such as AI, quantum computing, and biotechnology.
- *Strengthening Local Industries*: Promoting the growth of domestic industries through investments, subsidies, and regulatory reforms.
- *Prioritizing Green Technologies*: Integrating sustainability and green technologies into its industrial policy to achieve long-term economic resilience and competitiveness.

The Power of Collaboration

Beyond domestic initiatives, the United States and Europe recognize the need for deeper cooperation with allies and partners. This collaborative approach, often called “friend-shoring” or “ally-shoring,” involves creating more diversified and secure supply chains by partnering with nations that share common values or have strategic defense alliances.

Initiatives such as the Quad (Australia, India, Japan, and United States) and AUKUS (Australia, United Kingdom, and United States) exemplify these collaborative efforts. These partnerships aim to:

- *STRENGTHEN SUPPLY CHAIN RESILIENCE* by diversifying sources and reducing dependence on single suppliers.
- *ENHANCE TECHNOLOGICAL COOPERATION* through joint R&D, technology sharing, and the development of common standards.
- *COLLECTIVELY COUNTER CHINA’S* expanding influence by presenting a collective commitment and promoting alternative models of economic development.

The Road Ahead

The race for industrial leadership is intensifying. The future of the global economy hinges on how effectively nations navigate this complex and competitive landscape. Success will require a combination of strategic investments, robust international collaboration, and a relentless commitment to innovation. By adopting these approaches, countries can enhance their competitiveness, build more resilient economies, and help shape a future where technological leadership is shared among a diverse and cooperative group of nations.

The Quad:

Shaping a Democratic and Resilient Technological Future

In an era of intensifying geopolitical competition and rapid technological advancements, the Quad, has emerged as a vital partnership. Bringing together Australia, India, Japan, and the United States, the Quad seeks to lead a technological future grounded in democratic values and a rules-based order.

A Foundation for Technological Cooperation

At the inaugural Quad Leaders' Summit in March 2021, the member nations articulated a shared vision for a "free, open, and inclusive Indo-Pacific." This vision emphasized building resilient and diverse technology supply chains, promoting open and interoperable standards, and driving innovation in crucial areas such as cybersecurity, advanced communications, and clean energy.

The Quad's collaborative efforts are guided by four core principles: security, transparency, autonomy, and integrity.⁴³ These principles are crucial in the context of competing with China,⁴⁴ whose state-led model often prioritizes control and opacity over openness and transparency.

Core Principles in Action

The Quad's dedication to these principles is reflected in various initiatives. For example, the Quad has:

- *ESTABLISHED A CRITICAL AND EMERGING TECHNOLOGY WORKING GROUP* to coordinate joint efforts in key areas.
- *LAUNCHED INITIATIVES TO SECURE SUPPLY CHAINS* for critical materials, such as rare earth elements, by diversifying sourcing and investing in new extraction and processing technologies.
- *PROMOTED THE ADOPTION OF OPEN AND INTEROPERABLE TECHNOLOGY* standards like Open RAN to counter China's

dominance in 5G technology and ensure a more competitive and secure telecommunications landscape.

- *INCREASED R&D COLLABORATION* in areas such as AI, quantum computing, and biotechnological edge and foster innovation.

These efforts are aimed at strengthening resilience, diversifying technological capabilities, and bolstering security in the Indo-Pacific region.

Evolving Cooperation and Strategic Focus

Since the revitalized Quad summit in 2021, leaders have continued to meet regularly, deepening their cooperation and expanding their agenda. Key areas of progress include joint investments in critical technologies, initiatives to counter disinformation and cyber threats, and efforts to promote sustainable development in climate action.

Shaping a Secure and Responsible Technological Future

The Quad's collaborative approach extends beyond merely fostering innovation; it is about shaping a technological future grounded in responsibility, transparency, and shared democratic values. In an era increasingly defined by technological competition, the Quad is a crucial bulwark against authoritarian influence, championing a secure and equitable digital environment. By upholding these principles, the Quad advances innovation and reinforces a rules-based order, ensuring a free and open Indo-Pacific.

AUKUS: A Trilateral Partnership for Technological and Industrial Strength

On September 15, 2021, Australia, the United Kingdom, and the United States announced the formation of AUKUS, a trilateral security partnership focused on advanced defense capabilities and strategic industrial collaboration.⁴⁵ This initiative reflects the growing importance of technology in the 21st-century security

landscape and the need for closer cooperation among allies to maintain a competitive edge, particularly in the face of China's rising military power and assertive posture in the Indo-Pacific.

Pillar I:

Enhancing Defense Capabilities

AUKUS Pillar I centers on enhancing the defense capabilities of the three partner nations.⁴⁶ This includes cooperation in several key areas:

- *NUCLEAR-POWERED SUBMARINES:* Assisting Australia in acquiring nuclear-powered submarines, a significant step in strengthening its naval capabilities.
- *HYPERSONIC AND COUNTER-HYPERSONIC CAPABILITIES:* Developing advanced hypersonic and counter-hypersonic weapons systems to address evolving threats.
- *CYBERSECURITY:* Enhancing collaboration on cybersecurity to protect critical infrastructure and defend against cyberattacks.
- *ARTIFICIAL INTELLIGENCE AND QUANTUM TECHNOLOGIES:* Developing and deploying cutting-edge technologies in AI and quantum computing for defense applications.

These initiatives ensure technological superiority and interoperability among the AUKUS partners, allowing them to respond effectively to shared security challenges in the Indo-Pacific and beyond.

Pillar II:

Strategic Industrial Collaboration

AUKUS Pillar II broadens the scope to include strategic industrial policy, recognizing that a robust defense sector requires a resilient and collaborative industrial base.⁴⁷ This approach acknowledges that no country, except perhaps China, can independently manage

the entire supply chain for advanced defense systems. Pillar II emphasized the need for:

- *RELIABLE PROCUREMENT*: Securing access to essential raw materials and components, reducing reliance on potentially adversarial nations for critical supplies.
- *SKILLED WORKFORCE*: Developing a capable, well-trained workforce to support advanced manufacturing and technological innovation, ensuring that the AUKUS partners have the human capital necessary to compete in the 21st-century economy.
- *MANUFACTURING CAPACITY*: Expanding domestic manufacturing capabilities to produce critical defense platforms, reducing dependence on foreign suppliers and strengthening national resilience.
- *LOGISTICAL INFRASTRUCTURE*: Building efficient systems for stockpiling, delivering, and maintaining advanced technologies will ensure that the AUKUS partners can effectively deploy and sustain their defense capabilities.

By fostering collaboration among governments and private industry across the three nations, AUKUS aims to create a sustainable and secure ecosystem for developing and producing critical defense technologies. This collaboration will involve joint R&D projects, technology sharing, and the harmonization of regulations and standards.

The Role of Strategic Industrial Policy

AUKUS highlights the growing importance of strategic industrial policy in a world of intensifying geopolitical competition. It recognizes that governments must actively support key industries, foster innovation, and build resilient supply chains to maintain national security and economic competitiveness. This involves

significant investments in R&D, workforce training, and infrastructure development.

AUKUS and the Quad: Complementary Frameworks

AUKUS complements other strategic partnerships, such as the Quad, in promoting a free and open Indo-Pacific region. While AUKUS focuses specifically on defense technology and industrial collaboration among its three members, the Quad has a broader agenda that includes economic cooperation, climate action, and regional stability. Both initiatives, however, share a commitment to countering China's growing influence and upholding a rules-based international order.

In a rapidly changing global security environment, AUKUS exemplifies a new model of strategic cooperation. By pooling resources, sharing technological expertise, and coordinating industrial policies, the AUKUS partners aim to enhance their collective defense capabilities and maintain a competitive edge in critical technologies. This partnership underscores the growing importance of international collaboration in navigating the complexities of the 21st century and ensuring security and stability in the Indo-Pacific region.

Strengthening Defense Through Partnership: The U.S. Approach to Industrial Collaboration

In an era of growing geopolitical complexity, the United States recognizes that a strong and resilient defense industrial base is essential for national security. This understanding has driven a shift toward deeper collaboration with allies and partners, exemplified by initiatives such as the Quad and AUKUS and targeted policies like the National Defense Industrial Strategy (NIDS) and the Partnership for Indo-Pacific Industrial Resilience (PIPIR).⁴⁸

The National Defense Industrial Strategy

A cornerstone of the U.S. approach, the NIDS seeks to build a “modern, resilient defense industrial ecosystem” capable of deterring adversaries and meeting the demands of evolving security threats.⁴⁹ The strategy focuses on four key areas:

1. *RESILIENT SUPPLY CHAINS*: Ensuring reliable access to essential products, services, and technologies, delivered with speed, efficiently, and at the necessary scale to support defense requirements. This involves diversifying supply sources, reducing reliance on single suppliers, and promoting secure and sustainable supply chains.
2. *WORKFORCE READINESS*: Cultivating a highly skilled workforce capable of supporting advanced manufacturing and high-tech industries, ensuring long-term industrial strength and competitiveness of the U.S. defense industrial base. This involves investing in education and training programs, apprenticeships, and initiatives to attract and retain top talent in critical fields.
3. *FLEXIBLE ACQUISITION*: Developing agile and adaptable acquisition strategies that balance cost, efficiency, and scalability to meet diverse and evolving needs of the defense sector. This includes streamlining acquisition processes, promoting innovation, and leveraging new technologies to improve efficiency and responsiveness.
4. *ECONOMIC DETERRENCE*: Bolstering economic security through fair and effective market mechanisms that strengthen the defense industrial ecosystem within the United States and its allies.⁵⁰ This involves promoting competition, preventing market distortions, and ensuring a level playing field for businesses operating in the defense sector.

To achieve these objectives, NIDS emphasizes the importance of public-private partnerships, risk-sharing mechanisms and technological innovation, encouraging the industry to invest in critical sectors and enhance resilience.⁵¹

Expanding the Network:

The Partnership for Indo-Pacific Industrial Resilience

The Partnership for Indo-Pacific Industrial Resilience (PIPIR) extends U.S. defense industrial base policy to include close cooperation with allies and partner nations in the Indo-Pacific and Euro-Atlantic regions.⁵² PIPIR aims to “accelerate defense industrial base (DIB) cooperation” by:⁵³

- *REDUCING PRODUCTION BARRIERS*: Streamlining regulations and processes to facilitate seamless cross-border collaboration in the development and production of defense technologies.
- *CREATING NEW SUSTAINMENT HUBS*: Establishing regional centers for maintenance, repair, and overhaul (MRO) of critical equipment, ensuring operational readiness and reducing reliance on distant facilities.
- *ADDRESSING SUPPLY CHAIN CONSTRAINTS*: Collaborating to identify and mitigate vulnerabilities in defense supply chains, enhancing overall resilience and reducing dependence on potentially adversarial nations.

The Regional Sustainment Framework

A key component of PIPIR is the Regional Sustainment Framework (RSF), designed to optimize regional MRO capabilities.⁵⁴ Rather than rely solely on U.S.-based facilities, the RSF leverages the capabilities of partner countries, enabling more efficient and cost-effective sustainment of defense equipment. This approach strengthens the collective defense industrial network and promotes greater interoperability and cooperation among allies.

The Shangri-La Dialogue and Statement of Principles

At the 2024 Shangri-La Dialogue in Singapore, U.S. Secretary of Defense Lloyd J. Austin introduced a Statement of Principles for Indo-Pacific Defense Industrial Base Collaboration.⁵⁵ Endorsed by multiple countries, this statement outlines shared commitments to:

- *STRENGTHEN RESILIENCE*: Enhancing the collective ability to withstand disruptions and sustain critical defense capabilities.
- *ENHANCE WORKFORCE READINESS*: Building a skilled workforce to support advanced defense industries and maintain industrial strength.
- *PROMOTE DEFENSE INNOVATION*: Encouraging collaboration on R&D to ensure a technological edge and drive innovation.

The Strategic Importance of Industrial Collaboration

These initiatives reflect a growing acknowledgment that the United States and its allies cannot rely solely on isolated, national-level solutions. These frameworks foster a more resilient and agile defense network by pooling resources, sharing technological expertise, and coordinating industrial policies. This strategic collaboration ensures allied nations maintain a competitive edge in critical defense technologies while promoting stability and security across the Indo-Pacific and beyond.

**Revitalizing American Manufacturing:
A National Strategy for the 21st Century**

The United States is actively pursuing a comprehensive strategy to revitalize its manufacturing sector, recognizing that a strong domestic industrial base is essential for economic prosperity and national security. This effort acknowledges the need to invest in innovation, build a skilled workforce, and enhance the resilience of supply chains in the face of growing global competition.

Aligning with National Security Priorities

The focus on manufacturing aligns directly with the priorities outlined in the U.S. National Security Strategy (NSS), which underscores the interconnectedness of domestic and foreign policy. The NSS emphasizes the importance of a strong domestic industrial base for national security,⁵⁶ highlighting the need to invest in American workers and industries, rebuild supply chains, and lead the technological revolution. The National Strategy for Advanced Manufacturing serves as a roadmap for achieving these objectives and securing U.S. leadership in this critical sector.

Key Goals and Initiatives

The National Strategy for Advanced Manufacturing is built on three core goals:⁵⁷

- *DEVELOPING AND IMPLEMENTING ADVANCED MANUFACTURING TECHNOLOGIES*: This involves promoting the adoption of cutting-edge technologies—such as automation, robotics, AI, and advanced materials—to enhance productivity, efficiency, and competitiveness. The strategy outlines 12 key objectives in this area, encompassing initiatives such as accelerating innovation in microelectronics and semiconductors, developing innovative materials and processing technologies, and leading the future of smart manufacturing.
- *GROWING THE ADVANCED MANUFACTURING WORKFORCE*: Recognizing that a skilled workforce is essential for success in advanced manufacturing, this goal focuses on developing a highly trained workforce capable of meeting the demands of modern industries. The strategy emphasizes expanding and diversifying the talent pool, promoting advanced manufacturing education and training, and strengthening connections between employers and educational organizations.

- *BUILDING RESILIENCE INTO MANUFACTURING SUPPLY CHAINS AND ECOSYSTEMS*: This goal emphasizes the importance of strong and resilient supply chains that can withstand disruptions and ensure access to critical materials and components. The strategy includes objectives focused on enhancing supply chain interconnections, reducing vulnerabilities, and strengthening and revitalizing advanced manufacturing ecosystems.

Investing in American Manufacturing

The U.S. government has demonstrated its commitment to this strategy through significant legislative actions and investments:⁵⁸

- *BIPARTISAN INFRASTRUCTURE INVESTMENT AND JOBS ACT (IIJA)*: This landmark legislation provides funding for infrastructure projects crucial for a modern manufacturing sector.
- *INFLATION REDUCTION ACT*: This act aims to lower consumer costs and boost clean energy technology manufacturing, creating new opportunities for American businesses and workers.
- *CHIPS AND SCIENCE ACT*: This act seeks to revitalize the U.S. semiconductor industry by investing \$50 billion in R&D and providing incentives for domestic semiconductor production.⁵⁹

Furthermore, the United States has launched initiatives to support advanced manufacturing, including establishing 12 tech hubs across the nation to serve as centers for innovation and collaboration.⁶⁰ These hubs aim to unite businesses, universities, and government agencies to foster the development of critical technologies, create jobs in innovative industries, and strengthen U.S. economic competitiveness.

Fostering Public-Private Collaboration

The National Strategy for Advanced Manufacturing recognizes the importance of collaboration between the public and private sectors. By encouraging partnerships between government, industry, and academia, the strategy aims to create a more dynamic and innovative manufacturing ecosystem. This collaborative approach will help to accelerate the development and adoption of advanced technologies, ensure that workforce training programs align with the needs of industry, and promote the sharing of knowledge and resources.

Securing Economic Growth and Industrial Resilience

Through these initiatives, the United States aims to create a more competitive, innovation-driven manufacturing sector that can lead in the global market. By investing in advanced technologies, developing a skilled workforce, and strengthening supply chains, the United States seeks to enhance its manufacturing capabilities and secure its position as a global leader in this critical sector.

Conclusion:

Shaping the Future of Industrial Policy

The 21st century has ushered in a new era of industrial policy, one defined by intensifying geopolitical competition, rapid technological advancements, and the urgent need for national resilience. This era demands a more strategic and nuanced approach, where governments actively shape their economies to achieve not only economic prosperity but also national security and geopolitical influence.

The rise of China as a technological and economic powerhouse has been a key catalyst for this change. China's aggressive industrial policies and growing geopolitical ambitions have compelled other nations, particularly the United States and Europe, to re-evaluate their strategies. They are now pursuing a combination of domestic

investments, international collaboration, and targeted measures to counter China's influence and maintain their competitive edge.

This new era of industrial policy is characterized by several key trends:

- *THE RISE OF STRATEGIC INDUSTRIES:* Governments are prioritizing support for industries deemed critical for national security and economic competitiveness, such as semiconductors, AI, clean energy, and advanced manufacturing.
- *THE IMPORTANCE OF RESILIENCE:* Recent geopolitical events have exposed the vulnerabilities of global supply chains, leading nations to prioritize resilience and diversification to reduce their dependence on single suppliers and ensure access to critical goods.
- *THE ROLE OF INTERNATIONAL COLLABORATION:* While competition is intensifying, there is a growing recognition that international cooperation is essential to address shared challenges and promote a stable global economic order. Initiatives like the Quad and AUKUS exemplify this trend, fostering collaboration among like-minded nations.
- *THE BLURRING OF ECONOMIC AND SECURITY CONCERNS:* The lines between economic and security policy are becoming increasingly blurred, as industrial policy is now seen as a tool for achieving both economic and geopolitical objectives.

This new era presents both challenges and opportunities. Nations must navigate a complex landscape, balancing the need to support strategic industries with the importance of maintaining open markets and international cooperation. The choices made today will have far-reaching consequences, shaping the global economic and geopolitical landscape for decades to come.

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