The Global Economic Tapestry: An Analysis of Production Linked Incentive Schemes and Industrial Policies Across Continents

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***Abstract*—The global economic landscape is undergoing a significant transformation, marked by a pronounced resurgence of industrial policies as governments increasingly intervene to shape national economies. This paper provides an in-depth economic analysis of Production Linked Incentive (PLI) schemes and similar industrial policies across India, China, Southeast Asia, Europe, and the Americas. Drawing upon economic concepts from IB Economics HL curriculum, the study examines the multifaceted impacts of these policies on investment, production, employment, and exports. Furthermore, it critically evaluates the theoretical and empirical consequences of withdrawing such incentives on sectoral growth and international trade. The analysis reveals that while industrial policies are potent tools for economic transformation and strategic positioning, their success is contingent on careful design, dynamic adaptation, and a realistic assessment of both domestic market failures and international competitive dynamics. The withdrawal of such policies, if not managed strategically, risks undoing gains and exacerbating economic challenges, highlighting the nuanced nature of state intervention in an interconnected global economy.**

***Index Terms*—To ensure a clear and rigorous discussion, the following key economic and policy terms are defined:**

- **Production Linked Incentive (PLI) Scheme: A government initiative providing financial incentives to companies for incremental sales of products manufactured domestically.1**
- **Industrial Policy: Government interventions aimed at influencing the structure of industrial activity to achieve specific economic or non-economic objectives, such as promoting strategic sectors or fostering innovation.3**
- **Market Failure: Situations where the free market fails to allocate resources efficiently, leading to a suboptimal outcome from a societal perspective. This often provides the economic rationale for government intervention.5**
- **Externalities: Costs or benefits incurred by a third party who is not directly involved in a transaction. Positive externalities, such as knowledge spillovers from research and development, are often cited as a justification for industrial policy.7**
- **Subsidies: Financial assistance from the government to support specific industries or activities, typically by lowering production costs or prices. These can take various forms, including grants, loans, or tax benefits.3**
- **Tariffs: Taxes imposed on imported goods, designed to make them more expensive and thereby protect domestic industries from foreign competition.9**
- **Comparative Advantage: The ability of an economy to produce a good or service at a lower opportunity cost than another. Industrial policies sometimes aim to create or enhance comparative advantages.3**
- **Deadweight Loss: A net loss of economic efficiency that can occur when the equilibrium for a good or service is not achieved, often due to market distortions like subsidies.11**
- **Producer Surplus: The difference between the price producers receive for a good and the minimum price they are willing to accept. Subsidies typically increase producer surplus.11**
- **Consumer Surplus: The difference between the maximum price consumers are willing to pay for a good and the actual price they pay. Subsidies can increase consumer surplus by lowering prices.11**
- **Foreign Direct Investment (FDI): An investment made by a firm or individual in one country into business interests located in another country, often a key objective of industrial policies.2**
- **Gross Domestic Product (GDP): The total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period, a primary measure of economic output.14**
- **Purchasing Managers' Index (PMI): An economic indicator derived from monthly surveys of private sector companies, providing insights into the health of the manufacturing and service sectors.14**

I. INTRODUCTION

1.1 The Global Resurgence of Industrial Policy: A New Era of State Intervention

Industrial policy, once largely dismissed by mainstream economic thought due to concerns about market distortions and potential inefficiencies, is now experiencing a powerful resurgence across the globe.3 This renewed embrace of state intervention is not merely a cyclical phenomenon but rather a fundamental shift in economic strategy, driven by a confluence of profound global challenges. The vulnerabilities exposed by recent supply chain disruptions, intensified geopolitical competition, and the urgent imperative to address climate change have compelled governments to actively guide economic growth and innovation.17 This strategic reorientation reflects a growing recognition that relying solely on unfettered market forces may be insufficient to achieve critical national security, economic resilience, and environmental objectives. Consequently, states are increasingly deploying a range of policy tools to foster domestic manufacturing, attract strategic investments, create high-value jobs, and secure positions in future-oriented industries.

1.2 Defining Production Linked Incentives (PLIs) and their Objectives

Within this broader landscape of renewed industrial policy, Production Linked Incentive (PLI) schemes have emerged as a prominent and distinctive policy instrument, particularly in India. These schemes are government initiatives designed to provide financial incentives to companies based on incremental sales of products manufactured within the country.1 The core objective behind PLI schemes is multi-faceted: to significantly boost domestic manufacturing capabilities, attract substantial investments (both from domestic and foreign sources), generate widespread employment opportunities, enhance a nation's export competitiveness, reduce reliance on critical imports, and foster technological advancements within key sectors.1 The "production-linked" nature of these incentives is a key design feature, aiming to mitigate some traditional criticisms often leveled against blanket subsidies by directly tying financial support to tangible output and measurable sales, thereby theoretically promoting efficiency and accountability in policy outcomes.

1.3 Research Questions and Paper Structure

This paper seeks to address the following critical questions:

- How do PLI schemes and similar industrial policies impact investment, production, employment, and exports across diverse global regions, including India, China, Southeast Asia, Europe, and the Americas?
- What economic concepts from IB Economics HL curriculum are most relevant in analyzing these impacts?
- What are the theoretical and empirical consequences of withdrawing such production-linked incentives on sectoral growth and export performance?

The subsequent sections of this paper are structured to systematically address these questions. Section 2 will lay out the theoretical foundations of industrial policy, discussing the economic justifications for intervention and the various policy instruments employed. Sections 3 through 7 will then provide detailed regional case studies, analyzing the implementation and impact of industrial policies in India, China, Southeast Asia, Europe, and the Americas, respectively. Section 8 will delve into the critical issue of subsidy withdrawal, exploring its theoretical implications and empirical consequences through specific industry examples. Finally, Section 9 will offer a comparative analysis, synthesize cross-regional findings and derive policy recommendations, leading to a concluding summary in Section 10.

2. THEORETICAL FOUNDATIONS OF INDUSTRIAL POLICY

2.1 Market Failures and the Rationale for Government Intervention

The economic rationale for industrial policies is fundamentally rooted in the concept of market failures—situations where the free market, left to its own devices, fails to achieve an efficient allocation of resources. In such scenarios, government intervention is posited as a potential mechanism to correct these inefficiencies and improve overall societal welfare.

One primary justification for industrial policy stems from the presence of positive externalities. When a firm invests in research and development (R&D), skill development, or critical infrastructure, it often generates benefits that spill over to other firms or

society at large, which the investing firm cannot fully capture.5 For example, the development of a new technology or the training of a highly skilled workforce by one company can inadvertently benefit competitors who can then adopt or adapt these innovations, or customers who benefit from lower prices. This leads to an underinvestment in such activities from a societal perspective, as private returns are lower than social returns.8 Industrial policies, such as R&D subsidies or vocational training programs, aim to bridge this gap, incentivizing a socially optimal level of investment.

The infant industry argument provides another long-standing justification, particularly relevant for developing economies. This theory suggests that nascent industries in developing countries may possess a potential comparative advantage but require temporary protection or support to grow, achieve economies of scale, and build competitiveness before they can successfully compete on the global stage.25 The argument implies a temporary market imperfection that can be corrected by targeted policy, allowing the industry to mature.

Strategic trade theory, which applies to imperfectly competitive markets (e.g., oligopolies), posits that government intervention, such as subsidies, can strategically shift profits from foreign firms to domestic firms, thereby improving national welfare.26 This theoretical framework often involves considerations of market share in global industries and the ability to capture rents from international trade.

Finally, coordination failures can also justify government intervention. Industries may fail to coordinate necessary investments in complementary activities, such as developing a robust supply chain or essential infrastructure, leading to suboptimal overall outcomes. In such cases, the government can play a crucial role in facilitating and incentivizing such coordination to unlock broader economic potential.3

While these theoretical justifications provide a compelling basis for intervention, the practical implementation of industrial policy often faces significant challenges. Identifying the "right" industries to support, avoiding rent-seeking behavior by favored firms, and managing potential unintended consequences (such as retaliatory measures from other countries or the creation of inefficient industries) remain complex hurdles, highlighting the persistent gap between economic theory and real-world policy execution.

2.2 Economic Instruments: Subsidies, Tax Incentives, and Trade Barriers

Governments employ a diverse array of economic instruments to implement their industrial policy objectives, each designed to influence market behavior in specific ways.

Subsidies represent direct financial assistance provided to firms or industries, aiming to reduce production costs, encourage investment, or boost specific economic activities.3 These can manifest as direct grants, low-interest loans, or financial contributions. For instance, China's industrial policies frequently utilize fiscal subsidies at various governmental levels.3 In the United States, the 45X Production Tax Credit under the Inflation Reduction Act offers direct cash incentives for domestic manufacturing of solar components, effectively subsidizing production.29

Tax incentives are another prevalent tool, involving reductions in corporate or other taxes to create a more favorable operating environment for targeted industries. Examples include Value-Added Tax (VAT) exemptions, reduced corporate tax rates for high-tech industries, accelerated depreciation allowances for capital investments, and investment tax credits.8 The U.S. CHIPS Act, for instance, provides a substantial 25% investment tax credit for qualified investments in semiconductor manufacturing facilities.34 Accelerated depreciation, by allowing faster deduction of investment costs, improves cash flow and lowers initial tax liabilities, thereby reducing barriers to investment in clean technologies.31

Trade barriers, such as tariffs, quotas, and import restrictions, are used to protect domestic industries from foreign competition by making imported goods more expensive or less accessible.9 These measures aim to shift consumer demand towards domestically produced goods and provide a sheltered environment for local industries to grow.

Beyond direct financial and trade instruments, governments also deploy a range of non-fiscal measures. These include preferential land supply, reforms to market access, programs promoting entrepreneurship, direct support for research and development, initiatives for labor and skills development, efforts to coordinate supply chains, strategic government procurement, and investments in critical infrastructure.3 These tools aim to improve the

fundamental conditions for industrial growth and competitiveness.

The selection of a particular policy instrument often reflects a government's specific objectives and its assessment of the underlying market failures. For example, production-linked tax credits or direct subsidies aim to directly stimulate output, while R&D subsidies are geared towards fostering innovation. However, the interplay between these various tools can be complex, sometimes leading to unintended consequences or trade-offs between different policy goals.

2.3 Measuring Economic Impact: Investment, Production, Employment, and Exports

The effectiveness of industrial policies is typically evaluated by assessing their impact on key macroeconomic indicators. These metrics provide quantitative insights into whether the policy objectives are being met, though a comprehensive assessment requires a deeper qualitative understanding of their broader economic welfare implications and long-term sustainability.

Investment is a primary indicator, measuring the attraction of both domestic and foreign capital into targeted sectors.1 Increased investment signals confidence in the targeted sector and the policy's ability to create a favorable business environment.

Production or Output measures the increase in the volume or value-added of goods manufactured within the targeted industries.1 This metric directly assesses whether the policy is achieving its goal of boosting domestic manufacturing capacity.

Employment refers to the creation of new jobs and the enhancement of skills within the manufacturing sector.1 Job creation is a key socio-economic objective, particularly in labor-intensive industries, and skill development contributes to long-term productivity gains.

Exports evaluate the enhancement of international competitiveness and the increase in export volumes from the targeted sectors.1 Increased exports demonstrate a sector's ability to compete globally and contribute to a positive trade balance.

It is important to note that while these metrics provide valuable quantitative measures of success, they do not always capture the full economic welfare implications or the long-term sustainability of the interventions. For example, increased production driven by subsidies might lead to overcapacity or reduced productivity if not aligned with genuine market demand or a nation's true comparative advantage. A holistic assessment must consider these broader economic effects.

Table I: Overview of Key Industrial Policy Schemes by Region

Region/Country	Policy Name/Framework	Primary Objectives	Key Sectors Targeted	Main Policy Instruments
India	Production Linked Incentive (PLI) Schemes	Boost domestic manufacturing, attract investment, create jobs, enhance exports, reduce import dependence, technological advancement, self-reliance	Electronics & IT Hardware, Automobiles & Auto Components, Pharmaceuticals, Medical Devices, Food Processing, Textiles, Specialty Steel, White Goods, Solar PV Modules, Telecom & Networking Products, Advanced Chemistry Cells, Semiconductors	Financial incentives (incremental sales), tax breaks, grants, R&D support, infrastructure development
China	Made in China 2025 (MIC2025)	Global leadership in high-end manufacturing, reduce foreign technology reliance, enhance domestic innovation, build	Robotics, Semiconductors, New Energy Vehicles (NEVs), AI, Aerospace, Biotech, 3D Printing, Industrial Robots, Lithium-ion Batteries, Solar Modules	Fiscal subsidies, tax benefits (R&D super deduction, InnoCom), investment funds, preferential land supply, market access reforms, R&D support, labor & skills development, supply chain coordination, government

		global competitiveness		procurement, infrastructure investment, export controls
Southeast Asia	Diverse National Strategies (e.g., Vietnam's Investment Incentives, Malaysia's NIMP 2030, Indonesia's Hilirisasi, Thailand's Thailand 4.0)	Attract FDI, promote economic development, enhance competitiveness, move up value chain, green industrial base, job creation, skill development, regional integration	Manufacturing in Industrial Parks, EVs, Electronics, Semiconductors, Nickel Processing, Textiles, Food Processing, Automotive, Green Technology, Digital Technology, Advanced Materials	Corporate income tax incentives, import tax exemptions, land rent exemptions/reductions, labor training support, technology & R&D support, marketing & trade promotion, special economic zones, strategic docking with global value chains
Europe	Clean Industrial Deal (CID)	Competitive, climate-neutral industrial base, stimulate clean technology investment, industrial decarbonization, strengthen EU industrial competitiveness, strategic autonomy	Clean Technologies, Industrial Decarbonization, Automotive, Steel & Metals, Chemicals, Bioeconomy, Semiconductors, Green Energy, Critical Raw Materials	Accelerated depreciation, targeted tax credits, grants, EU funding programs (e.g., Chips Act, RePowerEU), regulatory frameworks, infrastructure development, skill development
Americas (USA, Canada, Mexico)	Biden Industrial Policy (CHIPS Act, Inflation Reduction Act, Bipartisan Infrastructure Law)	Foster high-tech manufacturing, job creation, strengthen supply chains, challenge technological rivals, clean energy transition, reshoring	Semiconductors, Clean Technologies (Solar, Wind, EV Batteries), Critical Minerals, Electric Vehicles, Infrastructure	Financial assistance (grants, loans), investment tax credits, production tax credits, 'Made in America' requirements, loan guarantees, domestic content requirements, trilateral forums, supply chain mapping

3. PRODUCTION LINKED INCENTIVE (PLI) SCHEMES IN INDIA

3.1 Policy Framework and Targeted Sectors

The Production Linked Incentive (PLI) schemes represent a cornerstone of the Government of India's contemporary economic strategy, introduced in March 2020 as a key component of the "Atmanirbhar Bharat" (Self-Reliant India) initiative.1 These schemes are designed to provide financial incentives to eligible companies based on their incremental sales of products manufactured within India.1 The initial focus was on a select few sectors deemed critical for India's manufacturing ambitions, namely mobile phones and allied electronic components, pharmaceuticals, and medical devices.2

Recognizing the potential and the need for broader industrial transformation, the scope of the PLI schemes was significantly expanded by November 2020 to encompass 14 key sectors, backed by a substantial outlay of Rs 1.97 lakh crore, equivalent to approximately $23.6 billion USD.2 This expansion signaled a strong government commitment to industrial policy as a central pillar of India's economic strategy, moving beyond initial pilot phases to a broad-based approach aimed at reshaping the nation's industrial structure. The targeted sectors now include: Electronics and IT Hardware, Automobiles and Auto Components, Pharmaceuticals and Medical Devices, Food Processing, Textiles, Specialty Steel, White Goods (such as air conditioners and LED lights), Solar Photovoltaic Modules, and Telecom & Networking Products.1 Further demonstrating this commitment, an additional Rs 19,500 crores (approximately $2.3 billion USD) was allocated specifically for solar PV modules in the Budget 2022-23, and the budgetary

allocation for the overall PLI scheme saw a 33% increase to Rs 6,200 crores (approximately $740 million USD) in the interim budget for FY 2024-25.13 The scheme commenced in 2020-21 and is effective for five years until 2025-26.13

3.2 Impact on Domestic Manufacturing, Investment, Job Creation, and Exports

The implementation of India's PLI schemes has yielded notable initial impacts across several economic indicators, with prominence observed within a few years of their launch:

- Investment: The schemes have been successful in attracting significant capital. As of August 2024, actual investments totaling nearly Rs 1.46 lakh crore (approximately $17.5 billion USD) have been realized.13 This influx of capital is critical for boosting domestic manufacturing capacity by encouraging both domestic and foreign direct investments.1
- Production/Sales: The policy has directly stimulated production, leading to reported sales of Rs 12.5 lakh crore (approximately $150 billion USD) of eligible products.13 This indicates a tangible increase in manufacturing output in the targeted sectors.
- Employment: The expansion of manufacturing activities under the PLI schemes has generated substantial employment opportunities. Over 9.5 lakh (950,000) individuals have been employed, and more than 1300 new manufacturing units have been established across 14 sectors and 27 States/Union Territories.13 This is particularly significant for a country like India with a large and growing workforce, as increased production in labor-intensive industries directly translates to job creation.1
- Exports: The schemes have demonstrably enhanced India's export capabilities, with exports surpassing Rs 4 lakh crores (approximately $48 billion USD).13 Key contributing sectors to this export growth include large-scale electronics manufacturing, pharmaceuticals, food processing, and telecom & networking products.13 The policy's objective to make Indian products globally competitive appears to be gaining traction.1
- Technological Advancement and Self-Reliance: By focusing on high-tech industries such as electronics, automotive, and pharmaceuticals, the PLI schemes are expected to drive technological advancements, improve product quality, foster innovation, and reduce India's dependence on imports, aligning with the broader vision of self-reliance.1

While these initial figures paint a positive picture of increased investment, production, employment, and exports, a closer examination reveals a crucial nuance: even in successful sectors like mobile manufacturing, the percentage of local value addition remains in single digits.24 This observation suggests that the PLI schemes, in their initial form, may be primarily attracting assembly operations rather than fostering deep integration into the domestic supply chain, particularly concerning critical components like semiconductor chips and subassemblies that are still largely imported.24 This raises a question about the extent to which the policy is achieving its goal of true self-reliance and technological leadership, indicating a potential limitation in the depth of industrial integration achieved thus far. Therefore, while the immediate objectives of boosting production and attracting investment have been largely met, the deeper objective of significant domestic value addition and self-reliance is still a work in progress.

3.3 Challenges and the Evolution to PLI 2.0

Despite the initial successes, the implementation of India's PLI framework has encountered several challenges that have prompted a re-evaluation and led to the consideration of "PLI 2.0" reforms.

Key challenges identified include:

Low Value Addition: As previously noted, a significant hurdle is the limited domestic value addition, even in successful sectors like mobile manufacturing, which continue to rely heavily on imported critical components.24 This undermines the objective of deep localization and self-sufficiency.

Limited Domestic Market Size: For certain sectors, such as telecom and electronics, the domestic market alone may not generate sufficient demand to encourage large-scale local manufacturing, necessitating a greater emphasis on export-led growth to achieve economies of scale.24

- Cost Competitiveness: Indian manufacturers often struggle with cost competitiveness when compared to their counterparts in countries like China and Vietnam.24 This is compounded by

limited access to international markets and lower technological capabilities, which reduce India's bargaining power in global supply chains.24

- Dependency on Foreign OEMs: The manufacturing ecosystem currently remains heavily driven by global players, leaving Indian firms dependent on them for critical technologies and hindering indigenous R&D investment, particularly in areas like semiconductors, specialty steel, and advanced chemical cells.24
- Implementation Hurdles: Practical challenges such as bureaucratic delays, regulatory complexities, and a lack of coordination among stakeholders have also been observed.1 Furthermore, a need for focused skill development remains to fully realize the potential of the schemes.1

The evolution to PLI 2.0 demonstrates a policy learning curve, where initial implementation revealed gaps in achieving deeper industrial integration and indigenous capability. To address these limitations, policymakers are proposing several key reforms:
Linking Incentives to Value Addition: PLI 2.0 aims to provide higher incentives for firms that achieve a greater percentage of domestic value addition, moving beyond mere incremental sales. This includes actively promoting the localization of key components like semiconductors and printed circuit boards (PCBs) and supporting indigenous R&D and manufacturing to reduce import dependence.24

Export-Oriented Incentives: To enhance global competitiveness, PLI 2.0 intends to link incentives with export performance, thereby encouraging increased production volumes and a globally competitive cost structure through economies of scale.24 This strategy aims to facilitate greater participation in international value chains.

Strengthening Local Component Manufacturing: Measures include encouraging joint ventures with global companies to build a robust ecosystem for sub-components and advanced manufacturing, and ensuring technology transfer and capacity building for local manufacturers by foreign Original Equipment Manufacturers (OEMs).24

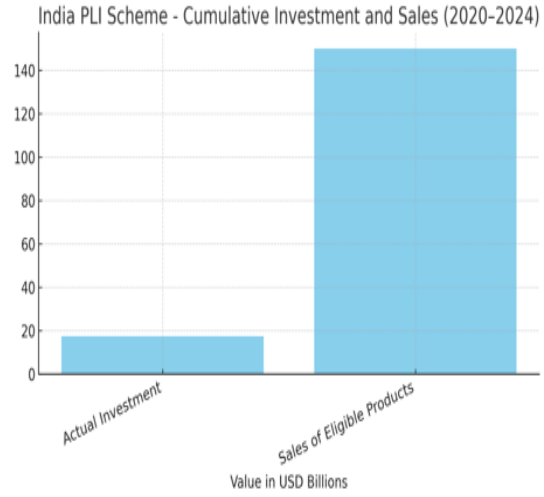
Supporting MSMEs and Domestic Players: New reforms may include special incentives for domestic Micro, Small, and Medium Enterprises (MSMEs) engaged in component manufacturing, alongside credit support and infrastructure development to help these smaller firms integrate into larger supply chains.24

Focus on Semiconductor Manufacturing: Recognizing the global semiconductor shortage and India's import reliance, the government is expected to provide stronger incentives for semiconductor fabrication units and push for indigenous chip design and assembly capabilities.2

By shifting focus from simply increasing production to emphasizing value addition and export performance, India aims to mitigate the "assembly-only" critique and foster genuine industrial upgrading. This strategic adjustment aligns with the long-term goals of the infant industry argument, seeking to nurture domestic industries until they can stand on their own in the global market.

Graphical Representations for India

- **Graph 1: India PLI Scheme - Cumulative Investment and Sales (2020-2024)**



The rapid increase in cumulative investment and sales catalyzed by the PLI scheme since its inception.

Figure 1: India PLI Scheme – Cumulative Investment and Sales (2020–2024)

The rapid increase in cumulative investment and sales catalysed by the PLI scheme since its inception.

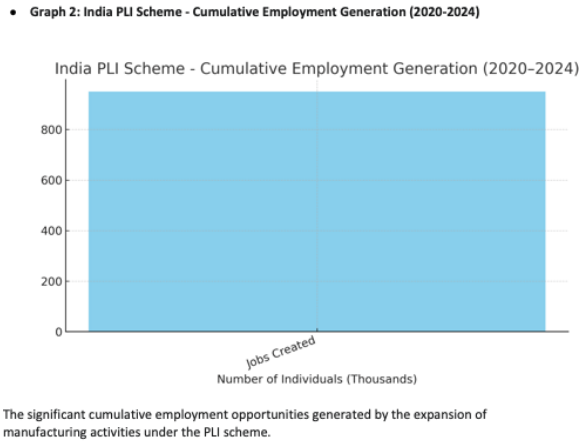


Figure 2: India PLI Scheme – Cumulative Employment Generation (2020–2024)

The significant cumulative employment opportunities generated by the expansion of manufacturing activities under the PLI scheme.

4. INDUSTRIAL POLICY IN CHINA: "MADE IN CHINA 2025"

4.1 Policy Evolution, Tools, and Strategic Objectives

"Made in China 2025" (MIC2025), unveiled in 2015, represents a pivotal and ambitious industrial policy aimed at transforming China into a global leader in high-end manufacturing by 2025, with aspirations to become a world leader by 2049.33 This comprehensive strategy seeks to reduce the nation's reliance on foreign technology, significantly enhance domestic innovation capabilities, and build formidable global competitiveness in strategic industries.15 Key sectors targeted under MIC2025 include robotics, semiconductors, new energy vehicles (NEVs), artificial intelligence (AI), aerospace, and biotechnology.15

The policy is characterized by extensive state support, often channeled through indirect mechanisms such as substantial tax benefits and dedicated investment funds.9 Examples of tax incentives include the R&D super deduction, which allows companies to deduct more than 100% of their R&D expenses (increased to 200% as of 2023), and the InnoCom program offering a reduced corporate tax rate of 15% for high- and new-technology enterprises.9 Investment funds, such as the $100 billion fund established since 2014 for the semiconductor industry, underscore the scale of financial commitment.59

China's industrial policy is notably multidimensional and implemented through a hierarchical governmental structure.3 A significant majority of these policies are issued by subnational authorities, with 45% originating from provincial governments and 39% from city-level governments, while only 13% come from the central government.3 This decentralized yet coordinated approach allows for extensive experimentation and adaptation to local conditions, potentially enhancing effectiveness in specific contexts. Policy tools are diverse, with fiscal subsidies appearing in 41% of policies, though over half do not rely on them, indicating a broader toolkit beyond direct financial aid.3 The choice of policy tools also dynamically evolves with industry maturity: in early phases, local governments prioritize tools that lower entry barriers, such as fiscal subsidies and preferential land supply. As industries mature, the focus shifts towards supporting R&D, labor and skills development, supply chain coordination, and consumer-side demand stimulation.3

4.2 Performance Analysis: Manufacturing Output, Investment, and Employment Growth

China's industrial policies, particularly MIC2025, have demonstrably driven substantial growth in high-tech manufacturing output and attracted significant investment, positioning the nation as a global leader in several strategic sectors. The impact of these policies became prominent within a few years of MIC2025's launch in 2015, with significant data points emerging from 2018 onwards and continuing through 2025.

Manufacturing Output: China's manufacturing sector recorded a value added of 33 trillion yuan in 2023, representing 35.0% of the global market.114 Industrial production exhibited robust growth, with a 6.8% year-on-year increase in June 2025, and manufacturing value added growing by 7.0% in the first half of 2025.14 High-tech manufacturing, a key focus of MIC2025, saw a 9.5% increase in value added in H1 2025, while equipment manufacturing grew by 10.2%.14 Specific product categories have shown exceptional growth, including 3D printing equipment (up 43.1%), new energy vehicles (up 36.2%), and industrial robots (up 35.6%) in H1 2025.14

Investment: Investment in manufacturing and high-tech sectors has expanded significantly.124 The Chinese government initially committed approximately US$300 billion to MIC2025 by 2018, with an additional $1.4 trillion invested following the

COVID-19 pandemic.75 Over $100 billion has been channeled into the semiconductor industry alone since 2014.59 Fixed-asset investment in manufacturing grew by 9.2% in 2024 over 2023.15

Employment: A core objective of China's industrial policy is to create skilled manpower and reduce unemployment.13 The manufacturing sector contributes approximately 28% to total employment in China.109 While the late 1990s saw a decline in manufacturing workers due to restructuring and privatization, employment began to rise again after 2000, regaining its upward trend.103

China's industrial policies have undeniably propelled the nation to a position of global leadership in several strategic sectors, including electric vehicles (dominating global output), solar modules (nearly 80% of global production), and lithium-ion batteries (over 75% of global manufacturing).67 These achievements indicate that the objectives of enhancing domestic innovation, building global competitiveness, and reducing foreign technology reliance have been substantially met in these specific areas. However, as discussed in Section 4.4, this impressive success has been achieved through extensive state intervention, which has raised concerns about market efficiency and the potential for overcapacity within these heavily subsidized industries, suggesting that the objective of efficient resource allocation may not have been fully met.

4.3 High-Tech Export Dominance and Global Supply Chain Integration

China's industrial policies have been instrumental in transforming its export profile, enabling it to become a dominant player in high-tech product exports. In June 2025, China's exports rose by 7.2% year-on-year, primarily driven by high-tech products such as semiconductors, electric vehicles (EVs), and advanced machinery.89 This signifies a structural realignment from being a producer of low-cost goods to a leader in value-added manufacturing.

The nation's dominance in key green technologies is particularly striking: China accounts for over 75% of global lithium-ion battery manufacturing, nearly 80% of solar module production, and the largest share of global EV output.67 Chinese firms are rapidly climbing the value chain, becoming formidable competitors in volume and cost-sensitive markets.68 Notably, despite U.S. tariff pressures, Chinese automakers have successfully redirected shipments to alternative markets, with EV exports to ASEAN and the EU surging by 20.8% year-on-year in April 2025, fueled by strong demand in countries like Indonesia and Thailand.48

This strategic shift from being merely the "world's factory" for low-cost goods to a "research laboratory of the world" and a leader in advanced manufacturing has significant geopolitical implications.109 It creates new dependencies in global supply chains, as other nations increasingly rely on China for critical components and advanced technologies. This has intensified trade tensions and strategic competition, particularly with countries like the United States.38 Furthermore, China's increasing use of export controls on critical minerals, such as gallium, highlights its growing strategic leverage in global supply chains.123 This dynamic demonstrates how industrial policy extends beyond economic objectives to serve broader geopolitical ambitions. The objective of enhancing export competitiveness in high-tech sectors has been largely met, leading to a significant shift in China's position in global value chains.

4.4 Economic Challenges: Overcapacity, Duplication, and Geopolitical Repercussions

Despite the impressive strides made under MIC2025, China's industrial policy framework has encountered significant economic challenges and triggered notable geopolitical repercussions. These challenges indicate that while some objectives were met, others, particularly those related to market efficiency and international relations, faced considerable hurdles.

Systemic design flaws have been identified, including the duplication of investment across various regions, misaligned local incentives, and an overreliance on subsidies.67 This has resulted in spatial inefficiencies and widespread industry-wide overcapacity, particularly evident in sectors like electric vehicles, where China could face a surplus of 20 million EVs by 2025.3 Such overproduction, driven by government investment in manufacturing, can lead to deflationary pressures, stressing corporate margins and expanding production beyond what domestic demand can absorb.15 This suggests that the objective of efficient resource allocation was not fully met, leading to market distortions.

The high-profile rollout of MIC2025 also attracted considerable geopolitical scrutiny, prompting a strong response from other major economies. This has led to

the imposition of export controls and investment restrictions by countries like the United States and the European Union, impacting China's access to key technologies, particularly in advanced semiconductors and chip-making equipment.15 For example, the EU imposed provisional tariffs of 21%-38% on Chinese EVs in June 2024, and Canada followed with 100% tariffs.15 These actions indicate that the objective of fostering global competitiveness without significant trade friction was not fully achieved.

The challenges faced by China's industrial policy, particularly the issues of overcapacity and the resulting geopolitical backlash, illustrate the limitations of a purely supply-side, state-led approach. While effective in mobilizing resources and achieving impressive scale, this strategy risks misallocating capital and provoking protectionist responses from trading partners. This dynamic can lead to global market distortions and a reduction in overall economic welfare, demonstrating the "terms of trade effect" and "firm relocation effect" in practice.7 Unilateral industrial policies, even if well-intentioned, can generate adverse international spillovers, highlighting the complex interplay between national industrial ambitions and the stability of the global trading system.

Graphical Representations for China

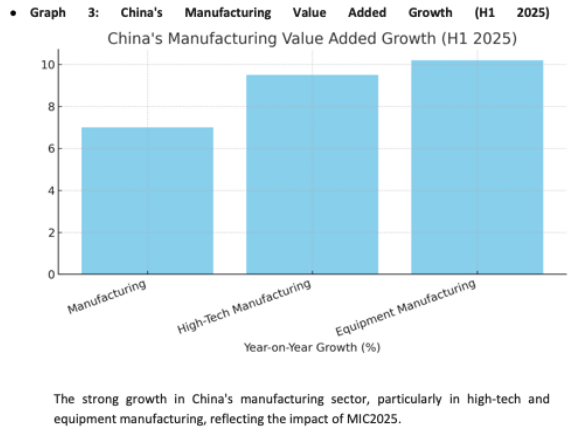


Figure 3: China's Manufacturing Value Added Growth (H1 2025)

The strong growth in China's manufacturing sector, particularly in high-tech and equipment manufacturing, reflecting the impact of MIC2025.

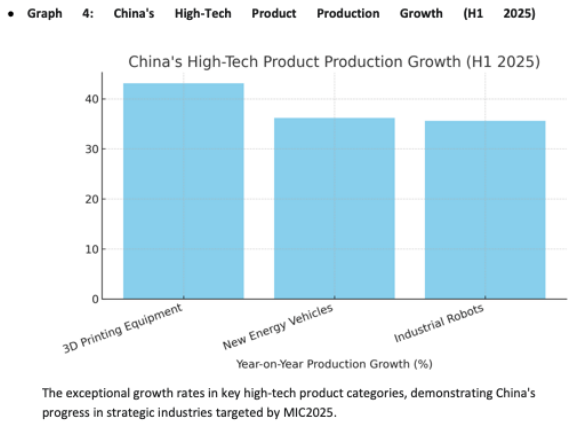


Figure 4: China's High-Tech Product Production Growth (H1 2025)

The exceptional growth rates in key high-tech product categories, demonstrating China's progress in strategic industries targeted by MIC2025.

5. INDUSTRIAL POLICY LANDSCAPE IN SOUTHEAST ASIA

5.1 Diverse National Strategies

Southeast Asian nations have a long and established history of strategically deploying industrial policy within the framework of the developmental state, adapting interventions to their unique national contexts and development stages.126 Countries such as Indonesia, Thailand, Malaysia, Singapore, and Vietnam have successfully industrialized over decades, evolving from foundational manufacturing sectors like textiles and electronics to more advanced, high value-added industries, including digital and green technologies.127 This regional approach often involves leveraging specific national endowments and strategic geographical locations to attract foreign direct investment (FDI) and integrate into global value chains. The prominence of these policies and their impacts varies, with some strategies having long-term effects over decades, while newer initiatives show impacts within a few years.

Vietnam: The nation continuously refines its investment incentive policies, particularly for the manufacturing sector within its Industrial Parks (IPs).30 These incentives are comprehensive, including a preferential corporate income tax rate of 10% for 15 years (compared to the standard 20%), a 4-year tax exemption followed by a 50% reduction for

the subsequent 9 years, and import tax exemptions for goods used to create fixed assets.30 Additionally, Vietnam offers land rent exemptions (ranging from 3 to 15 years) or reductions (50%) and provides crucial support for labor training, technology and R&D, marketing, and trade promotion, aiming to create a highly attractive investment environment.30 The impact of these policies is ongoing, with current incentives effective in 2025. 30

Malaysia: The Malaysian government actively welcomes FDI, with the manufacturing sector attracting 78.3% of the total $36.9 billion FDI in 2022.36 The New Industrial Master Plan (NIMP) 2030 is a key policy initiative, designed to propel the manufacturing industry up the value chain by prioritizing high-value job creation, local R&D, and deeper integration into global supply chains.36 NIMP 2030 sets ambitious targets, aiming for a 61% increase in manufacturing sector value-added to RM587.5 billion by 2030 (a Compound Annual Growth Rate, CAGR, of 6.5%) and a 20% increase in employment to 3.3 million (CAGR of 2.3%).41 The plan offers specific tax incentives for companies relocating to Malaysia, income tax incentives for the aerospace sector, and green technology/automation tax incentives to promote sustainable practices.36 The plan was promulgated in October 2023 and aims for targets by 2030. 42

Indonesia: Manufacturing is a vital pillar of the Indonesian economy, contributing 16.30% to GDP in Q2 2023.45 A key policy focus is downstream industrialization (hilirisasi), notably exemplified by the 2014 ban on raw nickel ore exports. This strategic move has transformed Indonesia into a global leader in refined nickel supply, accounting for 61% of the world's supply by 2024, and aims to establish the country as a future hub for EV battery manufacturing.43 The "Making Indonesia 4.0" initiative further underscores the government's commitment to industrial transformation through technology adoption, R&D, innovation, and sustainability.45 The policy also targets increasing manufacturing employment to 20% of the total workforce by 2024.51 The impact of the nickel ban was prominent by 2024, a decade after its implementation. 43

Thailand: Under its "Thailand 4.0" strategy, Thailand has significantly promoted the electric vehicle (EV) industry, now accounting for approximately 45% of ASEAN's total EV production.127 The government has implemented a substantial $15 billion stimulus package, prioritizing the modernization of transport networks, digital infrastructure, and energy grids, which has successfully attracted foreign direct investment into solar, wind, and hydrogen projects.54 The EV 3.5 initiative allocates $2.8 billion through 2027. 54

Singapore: Singapore has strategically transitioned its industrial structure from labor-intensive export manufacturing to capital- and technology-intensive manufacturing and high value-added services, establishing itself as a sophisticated export manufacturing base and regional hub.61 The government has a proactive 10-year plan to boost competitiveness and innovation in the manufacturing sector by 2030, with a strong emphasis on integrating Industry 4.0 and 5.0 principles and leveraging regional growth opportunities through ASEAN trade agreements. 47

The diverse industrial policies across Southeast Asia underscore a nuanced approach to comparative advantage, where governments actively "create" advantages rather than simply relying on existing ones. By strategically leveraging national endowments, geographical positioning, and targeted incentives, these nations aim to attract specific types of FDI and integrate more deeply into global value chains. The objectives of attracting FDI, promoting economic development, and enhancing competitiveness have been largely met in specific sectors, though the overall success is mixed.

5.2 Investment Flows and Sectoral Specialization

Investment flows into Southeast Asia reflect the region's growing attractiveness as a manufacturing hub, though outcomes can vary. In the first quarter of 2025, investment commitments across Southeast Asia showed mixed results due to global geopolitical headwinds, but Thailand and Vietnam notably recorded double-digit growth in investments year-on-year.16 A significant trend observed is the substantial manufacturing investment from China into Southeast Asia, exceeding US$40 billion from 2021 to 2023, a figure far surpassing Chinese manufacturing investment in other regions. Indonesia, Malaysia, and Cambodia have emerged as particular hotspots for this

investment.114 This substantial Chinese investment, especially in EV and electronics sectors, suggests a regional supply chain realignment, potentially driven by geopolitical tensions and a desire for diversification away from China. This highlights the dynamic nature of global supply chains and the complex interplay of economic and geopolitical factors.

Sectoral specialization driven by these policies is evident:

Electric Vehicles (EVs): Thailand is actively positioning itself as an EV hub, already accounting for approximately 45% of ASEAN's total EV production.127 Indonesia harbors ambitious goals to produce 600,000 electric vehicles and 2.5 million electric two-wheelers annually by 2030.43 Malaysia's NIMP 2030 also explicitly encourages investments in the EV sector.41

Electronics and Semiconductors: Malaysia's Electrical and Electronics (E&E) industry is robust, attracting major U.S. semiconductor manufacturers.36 Singapore's electronics manufacturing experienced a strong rebound in 2024, significantly driven by growth in the semiconductor segment.46 Thailand's electronics exports also demonstrated solid growth, increasing by 15% year-on-year in Q1 2025. 79

Nickel Processing: Indonesia's strategic ban on raw nickel ore exports has transformed it into a world leader in refined nickel supply, controlling 61% of the global market by 2024. This policy has attracted significant foreign direct investment into smelters and integrated processing facilities, particularly from China and South Korea, aiming to establish Indonesia as a key player in the global EV battery supply chain.43

These targeted investments and emerging specializations illustrate how Southeast Asian nations are actively shaping their industrial futures, often in response to global supply chain shifts and opportunities arising from advanced manufacturing and green technologies. The objective of attracting FDI and fostering sectoral specialization has been largely met in these areas.

5.3 Impact on Manufacturing Sector Growth and Export Competitiveness

The industrial policies implemented across Southeast Asia aim to bolster manufacturing growth and enhance export competitiveness, with varied outcomes reflecting the complexities of global economic integration. The prominence of these impacts is observed continuously, with recent data up to Q1/H1 2025.

Indonesia: The non-oil and gas manufacturing sector has consistently contributed around 17% to Indonesia's GDP over the past five quarters.81 In Q1 2025, the manufacturing sector grew by 4.31% year-on-year.81 The nation's manufactured exports have shown remarkable sustained growth for 43 consecutive months, culminating in a trade surplus of $2.41 billion in November 2023. 45 The objective of boosting manufacturing growth and exports has been largely met.

Malaysia: Manufacturing is a significant contributor to Malaysia's economy, accounting for 24% of its GDP and 84% of its exports in 2022.41 In Q1 2025, manufacturing value-added increased by 4.1% year-on-year to RM95.7 billion. 49 Tech exports, including Electrical & Electronics (E&E), machinery and equipment, and medical devices, demonstrated solid growth between January and May 2025.50 The NIMP 2030 aims for a 61% increase in manufacturing value-added and 20% increase in employment by 2030.41 Progress towards these objectives is ongoing and positive.

Singapore: Singapore's manufacturing sector experienced a robust expansion, growing by 7.4% year-on-year in Q4 2024. 73 This strong performance contributed to an overall GDP growth of 4.4% in 2024, driven significantly by manufacturing and the financial sector. 73 However, the manufacturing output did see a contraction of 7.5% year-on-year in Q2 2023, primarily due to weak global demand, particularly from the U.S. and EU, and overproduction in semiconductors. 60 Singapore's objective of transitioning to high value-added manufacturing and maintaining its export base has been largely met, though susceptible to global economic cycles.

Thailand: Thailand's manufacturing output recorded declines of 4.32% in 2023 and 1.3% in 2024. 84 Despite this, industrial product exports (excluding gold) expanded significantly by 22.3% in May 2025. 115 However, analyses suggest that Thailand's exports could decrease by -1.09% under certain tariff hikes, with industries like chemicals, textiles, and metal

products being particularly vulnerable. 72 There are also concerns that Thailand's economic structure is shifting from a producer to a transit country for goods, with imports from China growing faster than GDP, potentially hindering domestic manufacturing recovery. 40 Thailand's objectives of boosting manufacturing and exports face significant headwinds and are only partially met, with a risk of de-industrialisation in some areas.

The observed outcomes indicate that while industrial policies in Southeast Asia generally aim to boost manufacturing and exports, the actual results are mixed and highly susceptible to fluctuations in global demand and intensifying trade tensions. This highlights the inherent challenge of achieving sustained growth and competitiveness in an interconnected global economy, where even well-designed strategic interventions can face external headwinds.

5.4 Regional Dynamics and Developmental Disparities

The manufacturing upgrading observed in countries like Indonesia, Vietnam, Thailand, and Malaysia has been notably supported by strong national policies and strategic integration with global value chains.127 This has fostered increased intra-ASEAN trade, which currently accounts for 21.5% of the bloc's total trade, a proportion that is on the rise as economic integration progresses.127

However, this industrial restructuring and growth story also carries inherent risks, particularly the potential for widening economic and industrial gaps between member states within the ASEAN bloc.127 For instance, Singapore's GDP per capita stood at $92,930 in 2024, significantly higher than Malaysia ($13,140), Thailand ($7,770), and Indonesia ($5,030).127 Such substantial disparities in economic development and industrial policy success could complicate efforts to harmonize standards and promote seamless flows of labor and capital within ASEAN. If these industrial disparities become deeply entrenched, more developed economies might seek deeper integration with external partners through bilateral trade agreements, potentially undermining the cohesion and collective strength of the Association of Southeast Asian Nations.127 This situation illustrates the fragmentation risk and the challenges of effective policy coordination within a regional bloc when industrial policies are primarily driven by national interests rather than a unified regional strategy. The objective of promoting regional integration and balanced development is partially met, with significant disparities remaining.

Figure 5: Malaysia NIMP 2030 – Manufacturing Value-Added (2022 vs 2030)

Malaysia's current manufacturing value-added against its ambitious target under NIMP 2030.

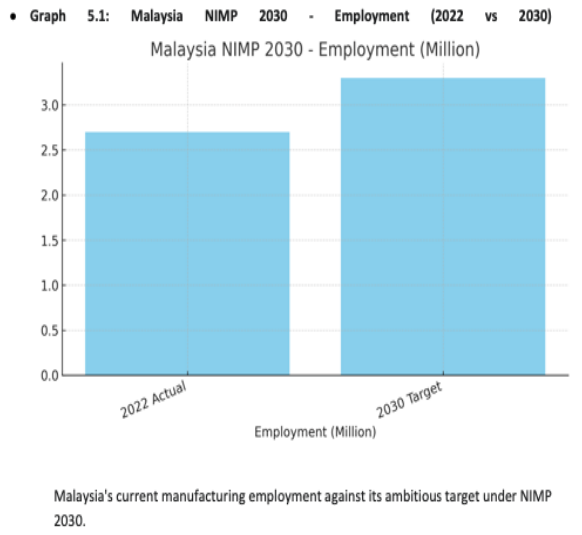
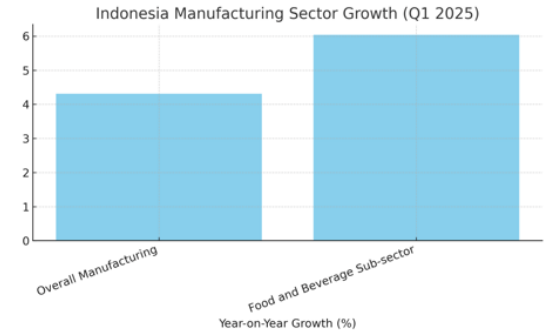


Figure 5.1: Malaysia NIMP 2030 – Employment (2022 vs 2030)

Malaysia's current manufacturing employment against its ambitious target under NIMP 2030.

- **Graph 6: Indonesia Manufacturing Sector Growth (Q1 2025)**



Recent growth in Indonesia's manufacturing sector, highlighting the performance of a key sub-sector.

Figure 6: Indonesia Manufacturing Sector Growth (Q1 2025)

Recent growth in Indonesia's manufacturing sector, highlighting the performance of a key sub-sector.

6. INDUSTRIAL POLICY IN EUROPE: THE CLEAN INDUSTRIAL DEAL

6.1 Objectives and Key Policy Instruments for Green Transition

The European Union's industrial policy is fundamentally geared towards enhancing the competitiveness of European industry, thereby driving sustainable growth and employment across the continent.20 A pivotal recent initiative in this regard is the Clean Industrial Deal (CID), launched in February 2025. The CID serves as a cornerstone of the EU's overarching strategy to build a competitive, climate-neutral industrial base, reflecting Europe's distinctive focus on its "twin transitions" – green and digital.21 The primary objective of the CID is to stimulate substantial investment in clean technologies and accelerate industrial decarbonization across Member States.21 The timeframe for the prominence of these impacts is ongoing, with many initiatives targeting 2030 and beyond.

To achieve these ambitious goals, the EU and its Member States are deploying a range of key policy instruments:

Accelerated Depreciation, up to Immediate Expensing: This tax measure allows companies to deduct the full cost of eligible clean technology investments (e.g., renewable energy systems, energy-efficient machinery) much faster, or even in the year of purchase or lease. 32 This effectively reduces initial tax liabilities, improves cash flow for businesses, and lowers financial barriers to green investment, aligning market mechanisms with climate objectives.32

Targeted Tax Credits: These are direct reductions in corporate tax liabilities, providing a strong incentive for investments in strategic sectors such as clean technology manufacturing and industrial decarbonization projects. 32 These tax credits are designed to be refundable or allow offsetting against other national taxes where feasible, enhancing their attractiveness to companies. 32

Funding Programs: The CID mobilizes significant financial resources, with over EUR100 billion allocated to support clean manufacturing.20 Specific initiatives include the Chips Act of 2022, which provides €15 billion for semiconductor development, with total investments in the sector planned to exceed €43 billion by 2030.22 Additionally, the RePowerEU plan aims to generate €210 billion in investments by 2027, primarily for energy savings measures and the expansion of renewable energies.22

This emphasis on tax incentives, rather than solely direct subsidies, reflects an attempt to align market mechanisms with climate goals while adhering to the EU's stringent state aid rules, which cap aid intensity to prevent unfair competition within the single market. 32 This approach aims to foster a resilient and investable clean technology ecosystem in Europe, strengthening industrial competitiveness while pursuing ambitious climate neutrality targets.32 The objectives of stimulating investment in clean technologies and accelerating industrial decarbonization are actively being pursued through these policies.

6.2 Impact on Clean Technology Manufacturing, Investment, and Employment

European industrial policies, particularly those under the Clean Industrial Deal, aim to significantly transform the manufacturing landscape, though the overall impact on broad manufacturing growth remains a dynamic process. The prominence of these impacts is expected to grow towards 2030 and 2035, aligning with the EU's climate and industrial targets.

Investment: Since 2017, European manufacturing has shown a resumption of growth in investments, indicating a positive response to policy signals and a

shift in focus.22 The CID is specifically designed to boost private investment in decarbonization and clean manufacturing, channeling capital towards sustainable practices.32

Production/Output: The EU's production of manufactured goods experienced increases of 8.5% in 2021 and 0.4% in 2022 compared to previous years. However, in 2023, there was a decrease of 1.2% compared to 2022. 62 Despite this overall decline, certain sectors have shown resilience or growth. For instance, the manufacturing of motor vehicles, trailers, and semi-trailers registered a 17% increase (at constant prices) from 2013-2023, and a 22% increase in nominal value from 2022-2023. 62 This suggests that while some traditional manufacturing areas may face headwinds, strategic sectors are still attracting investment and demonstrating growth.

Employment: A core objective of EU industrial policy is to maintain its role as a driver of sustainable growth and employment.20 In 2022, the manufacturing sector employed approximately 30 million people in the EU, contributing 18.7% to the total employment in the business economy. 52 Furthermore, exports to non-EU countries supported 31.1 million jobs in 2022, highlighting the significant link between manufacturing and international trade. 99 Projections suggest that manufacturing employment could increase by 0.7% by 2030, partly as a consequence of climate agreements and the green transition.100

While European industrial policy is strategically aiming to foster a green transition and strengthen overall competitiveness, the recent decline in broad manufacturing output (as observed in 2023) indicates that the impact on generalized manufacturing growth is still evolving or facing significant external headwinds. 62 This suggests that the intensive focus on clean technologies and other strategic sectors might lead to uneven growth across the manufacturing landscape, potentially creating internal disparities in economic performance between different industrial segments. Therefore, the objective of overall manufacturing growth is partially met, with a strong focus on green and digital transitions.

6.3 Challenges: Energy Costs, State Aid Rules, and Implementation Heterogeneity

European industrial policy, despite its ambitious goals, faces significant challenges that can impede its effectiveness and competitiveness. These challenges indicate that the objectives of achieving a competitive and climate-neutral industrial base are not yet fully met.

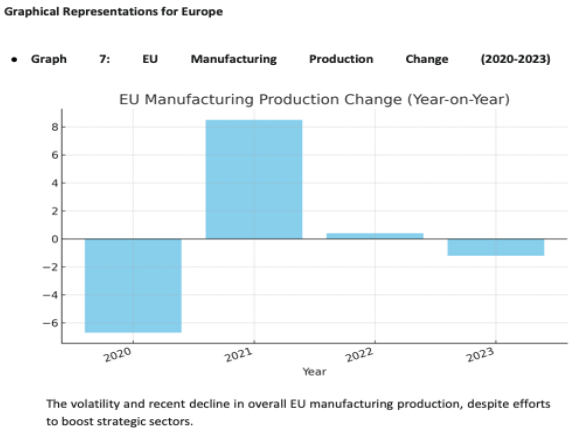
High Energy Costs: A critical and persistent challenge for European manufacturers, particularly in energy-intensive industries like steel, is the significantly higher cost of electricity compared to global competitors. In 2021, European manufacturers' electricity costs were twice as high as their U.S. counterparts.22 For the steel industry, industrial tariffs often exceed €100/MWh, whereas costs in the U.S. and China are frequently closer to €30-50/MWh. 135 This disparity creates a serious competitiveness challenge, making European-made steel potentially less competitive even with the Carbon Border Adjustment Mechanism (CBAM). 135

Complex State Aid Rules and Fragmentation: While tax incentives must comply with strict EU state aid regulations that cap aid intensity32 the existence of 27 distinct national industrial policy approaches across the EU has led to cross-border confusion and a lack of coherence. This heterogeneity can hinder innovation, slow down project implementation, and deter private capital from flowing efficiently across the single market. 21 The uneven national implementation of the EU's Clean Industrial Deal State Aid Framework (CISAF) further risks undermining its overall effectiveness. 135

Investment Climate and Competitiveness Concerns: A survey revealed that 90% of companies believe investment conditions in Europe are less favorable than three years prior, primarily citing high energy prices and burdensome regulation as key factors undermining competitiveness.22

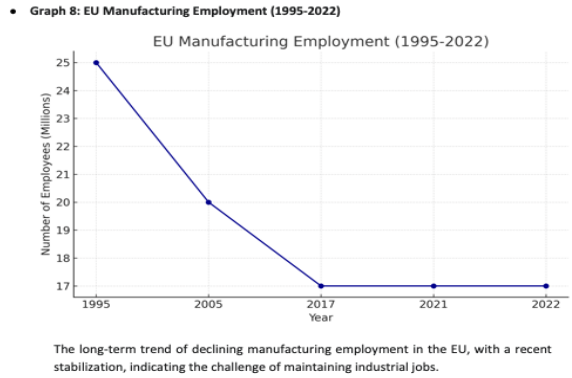
The tension between national industrial policies and overarching EU-level state aid rules creates a significant fragmentation risk within the single market. This can lead to inefficient resource allocation and competitive disadvantages for certain member states or industries. This situation highlights the classic economic challenge of coordinating policies across multiple jurisdictions to maximize collective welfare while respecting national sovereignty, especially when faced with external competitive pressures.

Graph 7: EU Manufacturing Production Change (2020–2023)



The volatility and recent decline in overall EU manufacturing production, despite efforts to boost strategic sectors.

Graph 8: EU Manufacturing Employment (1995–2022)



The long-term trend of declining manufacturing employment in the EU, with a recent stabilization, indicating the challenge of maintaining industrial jobs.

7. INDUSTRIAL POLICY IN THE AMERICAS: RESHORING AND REGIONAL INTEGRATION

7.1 Key Legislation: CHIPS Act and Inflation Reduction Act (IRA)

The United States, under President Biden's administration, has embarked on an emergent industrial policy characterized by a strategic focus on fostering high-technology manufacturing, creating domestic jobs, strengthening supply chains, and directly challenging China's technological ascent.38 This approach marks a significant departure from previous, more market-liberal stances, reflecting a global trend of strategic state intervention, often with a strong emphasis on geopolitical competition and national security. Key legislative measures underpinning this policy include:

The CHIPS and Science Act (CHIPS Act): This landmark legislation provides substantial financial incentives to the private sector to invest in semiconductor facilities and create jobs within the U.S..38 It allocates $39 billion in financial assistance over five years for semiconductor fabrication, assembly, testing, advanced packaging, production, or R&D facilities in the U.S. 38 Additionally, the Act offers a generous 25% investment tax credit for qualified investments in facilities primarily for manufacturing semiconductors or semiconductor manufacturing equipment in the U.S..34 Recognizing the global nature of supply chains, it also dedicates $500 million over five years to support international semiconductor supply chain security.38 The Act was passed in 2022, with incentives and funding available through FY2027. 44

The Inflation Reduction Act (IRA): The IRA is designed to incentivize the manufacturing of clean technologies and the production of critical minerals within the U.S. through a combination of tax credits and financial benefits.29 It features a 45X Production Tax Credit, which provides direct cash incentives for making solar components (photovoltaic cells, wafers, modules, polysilicon) domestically.29 The 48C Investment Tax Credit supports companies in setting up or expanding manufacturing facilities for solar and other clean technologies, offering up to 30% of capital investment back as a tax credit.29 The IRA further provides bonus credits for projects meeting domestic content and labor standards, aiming to ensure the benefits extend to American workers and supply chains.29 Most provisions became effective January 1, 2023, with new clean electricity tax credits replacing traditional ones from January 1, 2025. 35

The Bipartisan Infrastructure Law (BIL): This law provides substantial financial assistance to states and subnational governments for infrastructure construction and development across various sectors. Critically, it includes "Made in America" requirements, preferring projects where all iron and steel, manufactured products (with over 55% U.S. component cost), and construction materials are produced domestically. 38

These legislative acts collectively represent a strategic shift towards targeted, sector-specific incentives aimed at reshoring critical manufacturing capabilities and enhancing national security, reflecting a broader global trend of proactive state intervention in key industries. The objectives of fostering high-tech manufacturing, creating jobs, and strengthening supply chains have been actively pursued through these policies.

7.2 Impact on Semiconductor and Clean Energy Manufacturing Investment and Employment in the US

The U.S. industrial policy, particularly through the CHIPS Act and the Inflation Reduction Act (IRA), has successfully stimulated significant investment and job creation in targeted high-tech and clean energy sectors. The prominence of these impacts has been observed rapidly, within a few years of the legislation's enactment.

Semiconductors: The CHIPS Act has spurred an estimated over $110 billion (in 2019 dollars) in realized investment in U.S. electronics facilities, a figure that surpasses the entire real investment in electronics and computer manufacturing facilities from 2007 until 2020.34 Total private investments announced since the Act's introduction exceed $210 billion. 38 These investments are projected to support over 40,000 permanent jobs.34 Notably, Taiwan Semiconductor Manufacturing Company (TSMC) has announced plans to increase its U.S. investment in advanced semiconductor manufacturing by $100 billion, building upon an existing $65 billion investment, partly supported by CHIPS incentives. 44

Clean Energy (IRA): The IRA is actively transforming the U.S. solar manufacturing landscape, leading to the opening of new factories, the creation of more jobs, and billions of dollars in investment in domestic solar infrastructure.29 States such as Georgia, Ohio, and Texas have emerged as key investment hubs for solar manufacturing, attracting major companies like Qcells and First Solar.29

Overall Manufacturing: Broadly, tax incentives for semiconductor and clean energy production under the Biden administration triggered a factory-building boom, with investment in manufacturing facilities more than tripling from April 2021 through October 2024. 98 However, despite these targeted successes, the broader U.S. manufacturing sector has shown signs of stagnation or decline. Manufacturing employment dropped in June 2025 for the second consecutive month, and overall U.S. factories have been in decline for 30 of the 32 months since October 2022, according to the Institute for Supply Management. 98

This divergence suggests that while highly targeted industrial policies may succeed in creating "islands of excellence" within specific strategic sectors, they do not necessarily translate into a widespread manufacturing renaissance across the entire economy. This outcome raises questions about potential resource misallocation, where significant capital and policy attention are diverted to favored sectors, possibly at the expense of other productive uses or broader industrial growth. Therefore, the objectives of fostering high-tech manufacturing and job creation in specific sectors have been largely met, but the broader objective of revitalizing overall U.S. manufacturing is still a challenge.

7.3 Implications for Canada and Mexico: Competitive Disadvantages and Collaborative Opportunities

The U.S.-centric nature of President Biden's industrial policy, while designed to bolster domestic manufacturing, has created significant challenges for its North American partners, Mexico and Canada. This approach largely positions them in a supporting role rather than as fully integrated economic partners in high-technology manufacturing. 38 The implications of these policies are immediate and ongoing, affecting investment decisions and supply chain strategies across the region.

Competitive Disadvantages: The substantial incentives offered under the CHIPS Act and the Inflation Reduction Act (IRA) to bring manufacturing to the U.S. in semiconductors and clean technology place Mexico and Canada at a competitive disadvantage in attracting new investments and job creation in these fields. 38 Furthermore, the "Made in America" requirements embedded in the Bipartisan Infrastructure Law (BIL) limit the ability of Mexico and Canada to serve as suppliers for U.S. infrastructure projects funded by the BIL, unless specific exemptions apply, potentially leading to substantial lost opportunities for their domestic industries. 38

Collaborative Opportunities: Despite these disadvantages, North America continues to function as an economic region, albeit with a clear demarcation of

leadership. 38 Opportunities for greater integration exist, particularly in the electric vehicle sector, where the IRA's consumer tax credit for EVs requires final assembly in North America and specified percentages of critical minerals/battery components from the region.38 This has spurred investments in EV manufacturing in both Mexico (e.g., Ford and GM) and Canada (e.g., Volkswagen) to leverage these requirements.38 The U.S., Mexico, and Canada are also actively collaborating on initiatives to strengthen North American supply chain resilience in EV and semiconductor manufacturing. These efforts include organizing a trilateral semiconductor forum, coordinating efforts to map the semiconductor supply chain to identify unmet needs and complementary investment opportunities, and collecting details on critical mineral resources and reserves.128 Mexico and Canada can also participate in semiconductor supply chains by focusing on testing, packaging, and assembly, supporting the U.S. semiconductor industry where direct fabrication investment is less likely.38

The "America First" approach embedded in U.S. industrial policy, while boosting domestic manufacturing, risks fragmenting North American supply chains and creating competitive tensions with key allies. The observed collaborative initiatives represent a pragmatic attempt to mitigate these negative spillovers and leverage regional strengths, reflecting a complex interplay between nationalistic industrial policy and the imperative of regional economic integration and supply chain resilience. The objective of strengthening North American supply chains is partially met through these collaborative efforts, but the U.S.-centric nature of the policies creates competitive challenges for its neighbors.

8. THE ECONOMIC CONSEQUENCES OF PLI/SUBSIDY WITHDRAWAL

8.1 Theoretical Implications: Welfare Loss and Market Distortions

The withdrawal of Production Linked Incentives (PLIs) or other forms of industrial subsidies carries significant theoretical implications for economic welfare and market efficiency. While subsidies are initially implemented to correct identified market failures, their removal can expose underlying inefficiencies or create new challenges if not managed carefully.

One primary concern is the potential for welfare loss and the exacerbation of market distortions if the withdrawal is abrupt or ill-timed. Subsidies, by artificially lowering production costs or consumer prices, can encourage inefficient production where the marginal cost of production exceeds the world price, leading to a deadweight loss for society.11 When subsidies are removed, these inefficient producers may struggle to compete, leading to a contraction of output and potential job losses. Furthermore, the total cost of subsidies often extends beyond direct government expenditure, including increased taxation on consumers and a potential hindrance to other forms of economic development by diverting resources.11 The removal of subsidies can also lead to a reduction in consumer surplus if prices rise to reflect true production costs.11

From a market efficiency perspective, subsidies can sustain an inefficient allocation of resources, preventing capital and labor from moving to more productive uses in the absence of market signals.6 Moreover, subsidies can create a perverse incentive for firms to lobby for their continuance, even after the initial need for support has diminished or their usefulness has expired.6 Studies indicate that while subsidies may increase firms' global market shares, they often have no or even negative impacts on investment and productivity, suggesting that observed gains are not from genuine efficiency improvements but rather from the ability of subsidized firms to lower prices or deter competitors.63

The theoretical framework suggests that subsidy withdrawal, while potentially causing short-term disruption, can lead to long-term efficiency gains by removing market distortions and reallocating resources to more productive sectors. This assumes that the initial market failure which justified the subsidy has either been addressed, or the industry has matured to a point where it can compete without state support. However, the timing and method of withdrawal are crucial to mitigate severe negative impacts, as an abrupt cessation could trigger significant economic shocks.

8.2 Empirical Case Studies of Withdrawal Impacts

Empirical evidence from various industries and regions illustrates the complex and often varied consequences of industrial subsidy withdrawal. The timeframe for the prominence of these impacts can range from immediate to several years post-

withdrawal.

8.2.1 Automotive Industry (e.g., EV subsidies)

Government subsidies for electric vehicles (EVs) are typically implemented to drive technological advancement, stimulate revenue growth, and build market resilience in a nascent but strategically important sector.27 For instance, a $7,500 U.S. tax credit for EVs significantly boosted market share, increasing consumer surplus by approximately 20% and reducing deadweight loss by 15%. 12 This demonstrates the immediate effectiveness of subsidies in stimulating demand and market penetration.

However, some analyses suggest that EV subsidies have largely benefited buyers who would have purchased EVs even without the financial incentive, raising questions about the efficiency of the allocation of public funds. 138 Furthermore, economic models indicate that the optimal level of EV subsidies should fall as market competition intensifies, with the ultimate goal of making the industry self-sufficient and market-oriented. 26 Consequently, empirical findings confirm that subsidy cuts would lead to a decline in EV sales. 26 While subsidies can provide crucial short-term stability, their impact on long-term competitiveness remains uncertain, highly dependent on macroeconomic conditions and the strategic responses of individual firms.27

The automotive sector, particularly the EV segment, exemplifies the strategic dilemma inherent in subsidies: they can effectively stimulate initial demand and market share, but they may inadvertently foster dependency and do not guarantee long-term competitiveness or sustained innovation if not strategically phased out as the market matures and competition naturally increases. This highlights the critical importance of dynamic policy adjustment, where subsidies are gradually reduced as the industry gains self-sufficiency. When subsidies are withdrawn, the objective of self-sustaining growth is often not immediately met, leading to a drop in sales.

8.2.2 Solar Industry (e.g., Germany)

Germany's experience with solar energy subsidies provides a compelling case study of the complexities of industrial policy and its withdrawal. The Renewable Energy Sources Act (EEG) played a pioneering role, significantly reducing the costs of generating renewable energy and accelerating global scaling and price reduction for photovoltaic (PV) technology.139 This policy successfully nurtured the infant solar industry and contributed to its initial growth.

However, the subsequent emergence of cheaper Asian competitors, combined with domestic subsidy cuts, had severe consequences for German solar manufacturers. Many major players, including Q-Cells, Solon, and Conergy, were forced out of business, leading to a dramatic plummet in sector employment to just over 45,000 jobs by 2016.66 This outcome led many commentators to argue that German power customers were effectively subsidizing Chinese producers, as the domestic industry struggled to compete with lower labor costs and less stringent environmental regulations abroad.66 Studies have shown that ending subsidies can significantly slow the growth of renewable energy, with solar power expansion potentially decreasing by as much as 35% in Germany.57 Consequently, Germany is set to further curtail eligibility for solar subsidies from 2026 due to concerns about oversupply and financial strain on the government, aiming to encourage producers to participate directly in the market. 78

The German solar industry's trajectory demonstrates the limitations of the "infant industry" argument when confronted with intense global competition. While subsidies successfully nurtured the technology, premature withdrawal or a failure to adequately anticipate and respond to global competitive dynamics led to the collapse of a significant portion of domestic manufacturing. This underscores the challenges of managing global spillovers and maintaining competitiveness in a rapidly evolving global market post-subsidy. The objective of creating a self-sustaining, competitive domestic solar industry was not fully met after the initial withdrawal of subsidies.

8.2.3 Textile Industry (e.g., Bangladesh, India)

The textile industry offers varied empirical insights into the impacts of government support withdrawal, influenced by global trade dynamics and domestic policy shifts. The effects can be immediate and severe, as seen in Bangladesh, or more limited, as in some Indian cases.

The phasing out of global quota controls under the Multi-Fibre Arrangement (MFA) in 2005 significantly altered the competitiveness landscape of the textile and clothing (T&C) industry worldwide.94 While some countries like Bangladesh managed to achieve significant growth in their clothing exports (a ten-fold increase over 15 years), becoming a leading exporter, others, such as Maldives, saw their textile industries

largely wiped out as foreign investors withdrew.94 Bangladesh's relative success was partly attributed to the re-imposition of quotas on Chinese T&C exports by developed countries, which provided a temporary competitive advantage.94

In India, the experience with export subsidies in the textile sector has shown limited discernible impact on overall exports.25 Furthermore, the withdrawal of the United States' Generalized System of Preferences (GSP) program, which removed zero-tariff rates on certain Indian exports, had a limited effect on many of India's top exports, including textiles, suggesting that for some established sectors, the impact of such preferential treatment withdrawal might be less significant than anticipated. 102

More recently, in Bangladesh, the withdrawal of export incentives (which steadily dropped from 25% to just 1%) combined with the imposition of new taxes (e.g., corporate tax for textiles rising from 15% to 27.5%) has created severe distress. 121 This has led to yarn being sold below production costs, threatening the viability of textile mills, risking the collapse of the garments sector, and potentially affecting 1 million workers by 2028. 121 Studies confirm that reducing export subsidies in the textile sector can hurt production and employment. 93

These case studies reveal that the impact of subsidy withdrawal is highly varied and context-dependent. It underscores that the outcome is contingent on the industry's structural competitiveness, prevailing global trade dynamics (such as the presence of quotas on competitors), and the nature of complementary domestic policies or external shocks. The objective of fostering a self-sustaining textile industry was not met in Bangladesh after the withdrawal of incentives, leading to severe negative impacts.

8.2.4 Shipbuilding Industry (e.g., South Korea)

The shipbuilding industry holds immense strategic importance for the South Korean economy, contributing approximately 7% of the nation's exports and 5% of its total employment. 60 However, the Korean shipbuilding industry faced a near collapse in 2016, necessitating substantial government interventions, including massive financial rescue packages, to prevent a total industrial breakdown. 60 The impact of global competitive dynamics became prominent around 2008-2016.

This crisis was largely attributed to global overcapacity, particularly stemming from aggressive industrial policies and subsidies in China, which significantly depressed global shipbuilding prices. 60 Chinese subsidies from 2006 to 2013 dramatically boosted China's domestic investment and international market share by over 40%, with a substantial 70% of this expansion resulting from "business stealing" from established rivals like Japan and South Korea.65 While China achieved impressive output growth, the long-run gross return rate of its policy was relatively low (18%), and it led to industry fragmentation and idle capacity within China itself.65

The South Korean shipbuilding crisis, heavily influenced by the competitive dynamics created by Chinese subsidies and the subsequent global overcapacity, vividly illustrates the "firm relocation effect" and the inherent dangers of international "subsidy races". In such a highly competitive global market, the withdrawal of subsidies or a failure to match the level of state support from competitors can lead to significant market share loss and even the collapse of established industries, highlighting the intense global competition fostered by aggressive industrial policies. The objective of maintaining global leadership and competitiveness was severely challenged due to external factors and the inability to match foreign subsidies.

8.2.5 Steel Industry (e.g., Europe)

The European steel industry provides a historical and contemporary example of the complex interplay between state aid, market forces, and global competition. During the severe crisis of the 1970s and 1980s, characterized by falling demand, rising energy costs, and significant overcapacity, Member States of the European Economic Community (EEC) allocated substantial public resources for restructuring to prevent the bankruptcy of major steel undertakings. Following this period, EU state aid rules became particularly stringent for the steel sector due to persistent concerns about overcapacity and market distortions. The impacts of state aid and its subsequent tightening were prominent from the 1980s onwards.

Empirical analysis suggests that while state aid can temporarily boost firm-level employment and revenue for recipient firms, these benefits are often short-lived, with no discernible impact on long-term investment or labor productivity. Furthermore, such national-level state aid can create adverse spillover effects for competing firms within the single market, potentially undoing any positive effects on recipient firms after a

couple of years.

Currently, the EU's Clean Industrial Deal State Aid Framework (CISAF) aims to support energy-intensive industries like steel in their decarbonization efforts. However, concerns persist that uneven national implementation of this framework could undermine its effectiveness. A major ongoing challenge is the significantly higher energy costs faced by European steel producers (often >€100/MWh) compared to their counterparts in the U.S. and China (€30-50/MWh). This fundamental cost disadvantage makes European steel less competitive, even with the Carbon Border Adjustment Mechanism (CBAM) in place.

The history of the European steel industry demonstrates that state aid, while crucial for crisis management and restructuring, can lead to short-lived benefits and adverse spillovers if not coordinated effectively across a single market. The persistent challenge of high energy costs and intense global competition highlights that even with policy support, fundamental cost disadvantages can undermine long-term competitiveness, making subsidy withdrawal or ineffective aid highly detrimental to the sector's viability. The objective of maintaining a competitive steel industry has been partially met, with ongoing challenges.

8.3 Impact on Sectoral Growth, Employment, and Exports

The withdrawal or cessation of Production Linked Incentives and other forms of industrial subsidies generally poses a significant risk to sectoral growth, employment levels, and export performance, particularly in industries heavily reliant on state support or facing intense global competition. The prominence of these impacts is often immediate or within a few years of withdrawal.

Sectoral Growth: The cessation of subsidies can lead to a contraction in sectoral growth if not accompanied by adequate offset policies. A stark example is the German solar industry, where subsidy cuts and increased competition forced many major domestic players to close down. In the United States, if current green energy subsidies were to end, manufacturing production is predicted to flatline or even suffer a recession, indicating the fragility of growth in newly incentivized sectors without continued support.

Employment: The economic consequences of ending government manufacturing incentives can be severe for employment. An analysis suggests that allowing certain tax policies that encourage manufacturing in the U.S. to expire could put 1.1 million U.S. jobs at risk across manufacturing, transportation, information, and mining industries. More broadly, such expirations could reduce total U.S. employment by an average of 2.9 million jobs in the first decade. In Bangladesh, new taxes and a drastic reduction in export incentives for the textile sector threaten the livelihoods of 1 million workers by 2028 and could lead to the collapse of the entire garments sector, which is a major employer. 108

- Exports: Industrial subsidies generally serve to promote exports, making domestic products more competitive in international markets.4 Consequently, their absence or reduction can lead to a significant loss in export volumes. While some case studies, like India's GSP withdrawal, showed limited impact on many top exports, suggesting resilience in certain established sectors 102, others, such as the recent policy changes in Bangladesh's textile industry, face substantial export reduction and a decline in international competitiveness. 45

The magnitude of the impact of subsidy withdrawal depends critically on several factors: the industry's maturity, its inherent structural competitiveness, its level of integration into global value chains, and the presence of alternative competitive advantages or mitigating policies. A sector that has genuinely matured and developed its own competitive edge may withstand withdrawal better than one still heavily reliant on artificial support. In many cases, the original objectives of creating self-sustaining industries are not fully met upon withdrawal, leading to negative consequences.

8.4 Long-Term Competitiveness and Policy Stability

The long-term success and sustainability of any industrial policy fundamentally depend on its ability to transition industries towards self-sufficiency, gradually reducing their reliance on government funds. Achieving this requires a clear, consistent, and predictable policy environment.

Policy instability, characterized by sudden changes in incentives, the threat of withdrawal, or frequent shifts in government priorities, can create profound uncertainty for manufacturers and investors. This uncertainty often leads to delayed investment decisions, reduced hiring, and a reluctance to commit

to long-term projects. For instance, the U.S. manufacturing sector has expressed concerns about "massive tariff uncertainty," which has caused customers to delay commitments and factories to hold back on big investment decisions. Such unpredictability can undermine the long-term competitiveness of industries and deter future investment, creating a "poisoned well" effect where firms question the reliability of future government support. 32 The German solar industry's experience also highlights that discontinuing support mechanisms can slow growth, particularly if not coordinated with market realities

WORKS CITED

[1] Production linked incentive scheme and its impact on Indian Economy - AMJC, accessed on July 21, 2025, https://www.amjaincollege.edu.in/production-linked-incentive-scheme-and-its-impact-on-indian-economy/

[2] PLI Scheme - Definition, what is PLI Scheme, Advantages of PLI Scheme, and Latest News - ClearTax, accessed on July 21, 2025, https://cleartax.in/glossary/pli-scheme

[3] Industrial policy in China: Four key facts - VoxDev, accessed on July 21, 2025, https://voxdev.org/topic/macroeconomics-growth/industrial-policy-china-four-key-facts

[4] Trade Spillovers of Domestic Subsidies, WP/24/41, March 2024 - International Monetary Fund (IMF), accessed on July 21, 2025, https://www.imf.org/-/media/Files/Publications/WP/2024/English/wpiea2024041-print-pdf.ashx

[5] Innovation and research policies: Two case studies of R&D subsidies - EconStor, accessed on July 21, 2025, https://www.econstor.eu/bitstream/10419/44856/1/515665185.pdf

[6] Subsidies: Definition, How They Work, Pros and Cons - Investopedia, accessed on July 21, 2025, https://www.investopedia.com/terms/s/subsidy.asp

[7] Industrial policy in the EU: Working together to get it right | CEPR, accessed on July 21, 2025, https://cepr.org/voxeu/columns/industrial-policy-eu-working-together-get-it-right

[8] Federal tax policy: Targeted incentives for manufacturing in the post-World War II era, accessed on July 21, 2025, https://bipartisanpolicy.org/wp-content/uploads/2024/02/Federal-tax-policy-Targeted-incentives-for-manufacturing-in-the-post%E2%80%91World-War-II-era.pdf

[9] Government Incentives and Policy Support for Manufacturers in ..., accessed on July 21, 2025, https://www.diversitech-global.com/post/government-incentives-and-policy-support-for-manufacturers-in-china-and-the-usa

[10] Trump's 36% tariff a disaster for Thai economy, banks warn of ripple effect across sectors, accessed on July 21, 2025, https://www.nationthailand.com/business/economy/40052697

[11] The Effects of an Export Subsidy, accessed on July 21, 2025, https://kirti-shah112.medium.com/the-effects-of-an-export-subsidy-633f4392bb08

[12] An Analysis of Optimal Price and Subsidy Policy Adjustment in the Automotive Industry, accessed on July 21, 2025, https://nhsjs.com/2025/an-analysis-of-optimal-price-and-subsidy-policy-adjustment-in-the-automotive-industry/

[13] PLI Scheme: Boosting India's Manufacturing & Investments, accessed on July 21, 2025, https://www.rsm.global/india/insights/tax-insights/pli-scheme-in-india

[14] National Economy Made Steady Improvement Despite Challenges in the First Half Year, accessed on July 21, 2025, https://www.stats.gov.cn/english/PressRelease/202507/t20250715_1960408.html

[15] China's Economy: Current Trends and Issues - Congress.gov, accessed on July 21, 2025, https://www.congress.gov/crs-product/IF11667

[16] Southeast Asia quarterly economic review: Q1 2025 - McKinsey, accessed on July 21, 2025, https://www.mckinsey.com/featured-insights/future-of-asia/southeast-asia-quarterly-economic-review

[17] Decoding China's Industrial Policies - Asian Bureau of Finance and Economic Research | ABFER, accessed on July 21, 2025, https://abfer.org/media/abfer-events-2025/annual-conference/papers-

trade/AC25P4015_Decoding-Chinas-Industrial-Policies.pdf
[18] A Bitter Aftertaste: How State Aid Affects Recipient Firms and Their Competitors in Europe, WP/24/250, December 2024 - International Monetary Fund (IMF), accessed on July 21, 2025, https://www.imf.org/-/media/Files/Publications/WP/2024/English/wpiea2024250-print-pdf.ashx
[19] From protection to promotion: The new age of industrial policy - McKinsey, accessed on July 21, 2025, https://www.mckinsey.com/capabilities/geopolitics/our-insights/from-protection-to-promotion-the-new-age-of-industrial-policy
[20] General principles of EU industrial policy | Fact Sheets on the European Union, accessed on July 21, 2025, https://www.europarl.europa.eu/factsheets/en/sheet/61/general-principles-of-eu-industrial-policy
[21] Making the Clean Industrial Deal bankable: Recommendations to scale sustainability across EU industry - United Nations Environment Programme Finance Initiative, accessed on July 21, 2025, https://www.unepfi.org/industries/banking/making-the-clean-industrial-deal-bankable-recommendations-to-scale-sustainability-across-eu-industry/
[22] The European Industrial Strategy, driving sustainable growth and employment, accessed on July 21, 2025, https://cpram.com/fra/en/individual/publications/experts/article/the-european-industrial-strategy-driving-sustainable-growth-and-employment
[23] Working Paper 24-2: Trade policy, industrial policy, and the economic security of the European Union, accessed on July 21, 2025, https://www.piie.com/sites/default/files/2024-01/wp24-2_0.pdf
[24] India's Production-Linked Incentive (PLI) Scheme: Evaluating ..., accessed on July 21, 2025, https://vajiramandravi.com/current-affairs/pli/
[25] Evaluating the Case for Export Subsidies - Institute for Agriculture and Trade Policy, accessed on July 21, 2025, https://www.iatp.org/sites/default/files/Evaluating_the_Case_for_Export_Subsidies.htm
[26] Should electric vehicle subsidies phase down? An insight from the analysis of the increasingly competitive automobile market - Frontiers, accessed on July 21, 2025, https://www.frontiersin.org/journals/environmental-science/articles/10.3389/fenvs.2022.1019948/full
[27] Analysis of The Impact of Government Subsidies on Competitiveness in the Automotive Sector - ResearchGate, accessed on July 21, 2025, https://www.researchgate.net/publication/389263129_Analysis_of_The_Impact_of_Government_Subsidies_on_Competitiveness_in_the_Automotive_Sector
[28] Economic Incentives | US EPA, accessed on July 21, 2025, https://www.epa.gov/environmental-economics/economic-incentives
[29] How the Inflation Reduction Act Is Transforming U.S. Solar Manufacturing, accessed on July 21, 2025, https://arka360.com/ros/ira-impact-on-us-solar-manufacturing
[30] Investment Incentive Policies for Manufacturing in Vietnam's ..., accessed on July 21, 2025, https://globalreferral.group/investment-incentive-policies-for-manufacturing-in-vietnams-industrial-parks-2025/
[31] EU: European Commission issues recommendations on tax incentives to support Clean Industrial Deal - KPMG International, accessed on July 21, 2025, https://kpmg.com/us/en/taxnewsflash/news/2025/07/tnf-eu-european-commission-issues-recommendations-on-tax-incentives-to-support-clean-industrial-deal.html
[32] European Commission makes recommendations on tax incentives ..., accessed on July 21, 2025, https://taxation-customs.ec.europa.eu/news/european-commission-makes-recommendations-tax-incentives-accelerate-clean-industrial-transition-2025-07-02_en
[33] Was Made in China 2025 Successful? - U.S. Chamber of Commerce, accessed on July 21, 2025, https://www.uschamber.com/assets/documents/Was-MIC25-Successful-final.pdf
[34] The CHIPS Act already puts America first. Scrapping it would poison the well for US investment. | PIIE, accessed on July 21, 2025, https://www.piie.com/blogs/realtime-

economics/2025/chips-act-already-puts-america-first-scrapping-it-would-poison-well
[35] Summary of Inflation Reduction Act provisions related to renewable energy | US EPA, accessed on July 21, 2025, https://www.epa.gov/green-power-markets/summary-inflation-reduction-act-provisions-related-renewable-energy
[36] 2023 Investment Climate Statements: Malaysia - State Department, accessed on July 21, 2025, https://www.state.gov/reports/2023-investment-climate-statements/malaysia/
[37] Economic impacts of the expiration of tax policies that encourage manufacturing in the United States, accessed on July 21, 2025, https://nam.org/wp-content/uploads/securepdfs/2025/01/NAM_EY_TCJA_Mfg_Provisions_Analysis.pdf
[38] President Biden's Industrial Policy and Prospects for North American ..., accessed on July 21, 2025, https://usmex.ucsd.edu/_files/230918_WhitePaper_JohnMcNeece_NorthAmericanCompetitivenessWorkingGroup_President-Bidens-Industrial-Policy-and-Prospects-for-North-American-Regionalization.pdf
[39] China's economy grows at a robust pace as trade truce eases pressure from US tariffs, accessed on July 21, 2025, https://apnews.com/article/china-economy-tariffs-trump-jinping-366d7a4a8a652f1a4aa536728439f5aa
[40] Alarm Bells Ring: Nearly 3,000 Thai Industries At Risk of Becoming 'Chinese Product Fronts', accessed on July 21, 2025, https://www.nationthailand.com/business/economy/40052831
[41] New Industrial Master Plan (NIMP) 2030 Malaysia | Article - HSBC Business Go, accessed on July 21, 2025, https://www.businessgo.hsbc.com/en/article/new-industrial-master-plan-nimp-2030-malaysia
[42] Launch of the New Industrial Master Plan 2030 (NIMP 2030) - MIDA | Malaysian Investment Development Authority, accessed on July 21, 2025, https://www.mida.gov.my/launch-of-the-new-industrial-master-plan-2030-nimp-2030/
[43] The Indonesia Manufacturing Industry: Powering Growth - Eos Global Expansion, accessed on July 21, 2025, https://eosglobalexpansion.com/indonesia-manufacturing-industry-growth/
[44] Policy Backgrounder: The Future of the CHIPS and Science Act - The Conference Board, accessed on July 21, 2025, https://www.conference-board.org/research/ced-policy-backgrounders/the-future-of-the-CHIPS-and-Science-Act
[45] How the Manufacturing Sector Drives Indonesia's Economic Growth, accessed on July 21, 2025, https://bawalaksana.co/manufacturing-sector-drives-economic-growth/
[46] Singapore in 2025: Riding the Wave of Strong Manufacturing Growth - fundsupermart.com, accessed on July 21, 2025, https://secure.fundsupermart.com/fsmone/article/rcms315080/singapore-in-2025-riding-the-wave-of-strong-manufacturing-growth
[47] Singapore's Manufacturing Sector in 2025: Trends & Opportunities, accessed on July 21, 2025, https://rhbgroup.com.sg/rhb/reimagine/article/singapore-manufacturing-sector-trends-and-opportunities
[48] Analysis: China's Economy and Its Influence on Global Markets | U.S. Bank, accessed on July 21, 2025, https://www.usbank.com/investing/financial-perspectives/market-news/chinas-economic-influence.html
[49] Malaysia sees improved trade, investment performance in Q2 2025: MITI's latest update, accessed on July 21, 2025, https://www.humanresourcesonline.net/malaysia-sees-improved-trade-investment-performance-in-q2-2025-miti-s-latest-update
[50] Tech exports and project delivery show progress under NIMP - The Malaysian Reserve, accessed on July 21, 2025, https://themalaysianreserve.com/2025/07/15/tech-exports-and-project-delivery-show-progress-under-nimp/
[51] Indonesia's Manufacturing Sector: Practical Information for Investors - ASEAN Briefing, accessed on July 21, 2025, https://www.aseanbriefing.com/doing-business-guide/indonesia/sector-insights/indonesia-s-manufacturing-sector-practical-information-for-investors
[52] Businesses in the manufacturing sector - Statistics Explained - Eurostat, accessed on July 21, 2025,

https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Businesses_in_the_manufacturing_sector
[53] Impact assessments - European Commission, accessed on July 21, 2025, https://commission.europa.eu/law/law-making-process/planning-and-proposing-law/impact-assessments_en
[54] Thailand's Strategic Trade Reforms: A Blueprint for Resilience and Investment Opportunities, accessed on July 21, 2025, https://www.ainvest.com/news/thailand-strategic-trade-reforms-blueprint-resilience-investment-opportunities-2507/
[55] State Tax Incentives for Economic Development - Urban Institute, accessed on July 21, 2025, https://www.urban.org/research/publication/state-tax-incentives-economic-development
[56] Sustainability of the New Energy Automobile Industry: Examining the Relationship among Government Subsidies, R&D Intensity, and Innovation Performance - MDPI, accessed on July 21, 2025, https://www.mdpi.com/2071-1050/15/20/14794
[57] Ending Subsidies Slows the Growth of Wind and Solar Power - RIFS Potsdam, accessed on July 21, 2025, https://www.rifs-potsdam.de/en/blog/2021/10/ending-subsidies-slows-growth-wind-and-solar-power
[58] China's Economy in H1 2025: GDP, Trade, and FDI Highlights, accessed on July 21, 2025, https://www.china-briefing.com/news/chinas-economy-in-h1-2025-gdp-trade-and-fdi-highlights/
[59] Why China’s $100 billion AI investment is raising urgent questions for US schools and innovation policies, accessed on July 21, 2025, https://timesofindia.indiatimes.com/education/news/why-chinas-100-billion-ai-investment-is-raising-urgent-questions-for-us-schools-and-innovation-policies/articleshow/122567174.cms
[60] Singapore's Resilient Growth Amid Manufacturing Slump: Sector-Specific Allocations for Investors - AInvest, accessed on July 21, 2025, https://www.ainvest.com/news/singapore-resilient-growth-manufacturing-slump-sector-specific-allocations-investors-2507/
[61] The Singapore Model of Industrial Policy: Past Evolution and Current Thinking - IADB Publications, accessed on July 21, 2025, https://publications.iadb.org/publications/english/document/The-Singapore-Model-of-Industrial-Policy-Past-Evolution-and-Current-Thinking.pdf
[62] Industrial production statistics - Statistics Explained - Eurostat - European Commission, accessed on July 21, 2025, https://ec.europa.eu/eurostat/statistics-explained/index.php/Industrial_production_statistics
[63] The Market Implications of Industrial Subsidies | OECD, accessed on July 21, 2025, https://www.oecd.org/en/publications/the-market-implications-of-industrial-subsidies_e40b793f-en.html
[64] State aid for the restructuring of the Spanish steel industry from a European perspective (1975–1988) | Investigaciones de Historia Económica - Economic History Research - Elsevier, accessed on July 21, 2025, https://www.elsevier.es/es-revista-investigaciones-historia-economica-economic-328-articulo-state-aid-for-restructuring-spanish-S1698698916000059
[65] Germany - Countries & Regions - IEA, accessed on July 21, 2025, https://www.iea.org/countries/germany
[66] Solar power in Germany – output, business & perspectives | Clean Energy Wire, accessed on July 21, 2025, https://www.cleanenergywire.org/factsheets/solar-power-germany-output-business-perspectives
[67] Made in China 2.0: The future of global manufacturing? - The World Economic Forum, accessed on July 21, 2025, https://www.weforum.org/stories/2025/06/how-china-is-reinventing-the-future-of-global-manufacturing/
[68] Assessing the Success of 'Made In China 2025' - The Diplomat, accessed on July 21, 2025, https://thediplomat.com/2025/05/assessing-the-success-of-made-in-china-2025/
[69] Economic Report 2024 Thailand - SECO, accessed on July 21, 2025, https://www.seco.admin.ch/dam/seco/fr/dokumente/Aussenwirtschaft/Wirtschaftsbeziehungen/L%C3%A4nderinformationen/Asien_Ozeanien/wirtschaftsbericht_thailand.pdf.download.pdf/Wirtschaftsbericht_Thailand_2025.pdf

[70] Singapore (FDI) Foreign Direct Investment: By Industry: Manufacturing | Economic Indicators, accessed on July 21, 2025, https://www.ceicdata.com/en/singapore/foreign-direct-investment-by-industry/fdi-by-industry-manufacturing
[71] Alliance for Automotive Innovation Releases NEW Economic Data, accessed on July 21, 2025, https://www.autosinnovate.org/posts/press-release/auto-innovators-data-driven-report-release
[72] Survey Report: Detailed Analysis of Trade War Impacts on Thai Consumers, accessed on July 21, 2025, https://www.thailand-business-news.com/trade/208708-survey-report-detailed-analysis-of-trade-war-impacts-on-thai-consumers
[73] ECONOMIC SURVEYOF SINGAPORE 2024 - MTI, accessed on July 21, 2025, https://www.mti.gov.sg/-/media/MTI/Resources/Economic-Survey-of-Singapore/2024/Economic-Survey-of-Singapore-2024/FullReport_AES2024.pdf
[74] Industrial Policy Implementation: Empirical Evidence from China's Shipbuilding Industry - Panle Jia Barwick, accessed on July 21, 2025, https://panlebarwick.github.io/papers/Yr23_ChinaShipyard.pdf
[75] Made in China 2025 - Wikipedia, accessed on July 21, 2025, https://en.wikipedia.org/wiki/Made_in_China_2025
[76] Impact of Trade War 2.0 on Thailand's Industrial and Service Sectors Round One, accessed on July 21, 2025, https://www.krungsri.com/en/research/research-intelligence/Trade-War-Industry-2025
[77] The Rise of Sector-Specific Incentives: States Double Down on Advanced Manufacturing, accessed on July 21, 2025, https://www.c2er.org/2025/05/the-rise-of-sector-specific-incentives-states-double-down-on-advanced-manufacturing/
[78] Renewable Energy Overload Forces Germany to Pull The Plug On Solar Funding, accessed on July 21, 2025, https://thedeepdive.ca/renewable-energy-overload-forces-germany-to-pull-the-plug-on-solar-funding/
[79] Navigating Thailand's Manufacturing Renaissance: Growth Opportunities vs. US Tariff Headwinds - AInvest, accessed on July 21, 2025, https://www.ainvest.com/news/navigating-thailand-manufacturing-renaissance-growth-opportunities-tariff-headwinds-2505/
[80] National Economy Withstood Pressure and Maintained Stable Growth in April, accessed on July 21, 2025, https://www.stats.gov.cn/english/PressRelease/202505/t20250519_1959854.html
[81] Indonesia's Manufacturing Sector: Growth Amid Global and Domestic Pressures, accessed on July 21, 2025, https://business-indonesia.org/news/indonesia-s-manufacturing-sector-growth-amid-global-and-domestic-pressures
[82] China Industrial Production - Trading Economics, accessed on July 21, 2025, https://tradingeconomics.com/china/industrial-production
[83] National Economy Sustained Recovery Momentum with Overall Performance Stable in May, accessed on July 21, 2025, https://www.stats.gov.cn/english/PressRelease/202406/t20240617_1954715.html
[84] Thailand Manufacturing Output | Historical Chart & Data - Macrotrends, accessed on July 21, 2025, https://www.macrotrends.net/global-metrics/countries/tha/thailand/manufacturing-output
[85] Thailand Manufacturing Production (ann. var. %) - FocusEconomics, accessed on July 21, 2025, https://www.focus-economics.com/country-indicator/thailand/manufacturing/
[86] Manufacturing - Latest Data - Statistics Singapore, accessed on July 21, 2025, https://www.singstat.gov.sg/find-data/search-by-theme/industry/manufacturing
[87] Indonesia Manufacturing Output | Historical Chart & Data - Macrotrends, accessed on July 21, 2025, https://www.macrotrends.net/global-metrics/countries/idn/indonesia/manufacturing-output
[88] The impact of Government policies on UK manufacturing since 1945 - GOV.UK, accessed on July 21, 2025, https://assets.publishing.service.gov.uk/media/5a7c8b07ed915d6969f459d1/ep2-government-policy-since-1945.pdf
[89] China's Tech-Driven Export Surge: A Structural

Shift to High-Tech Dominance - AInvest, accessed on July 21, 2025, https://www.ainvest.com/news/china-tech-driven-export-surge-structural-shift-high-tech-dominance-2507/

[90] Country's reform keeps growth on right track - Chinadaily.com.cn, accessed on July 21, 2025, https://global.chinadaily.com.cn/a/202507/16/WS6876e151a31000e9a573c34f.html

[91] New data centres could undermine Europe's energy transition, eating into its emissions cuts, study finds - Beyond Fossil Fuels, accessed on July 21, 2025, https://beyondfossilfuels.org/2025/02/10/new-data-centres-could-undermine-europes-energy-transition-eating-into-its-emissions-cuts/

[92] Parameters Characterizing the Performance of Automotive Electronic Control Systems on Petrol Engine Emissions - MDPI, accessed on July 21, 2025, https://www.mdpi.com/2673-4591/100/1/41

[93] Export Subsidy Reforms and Productivity Improvements: The Case of the Indian Textile and Clothing Sector | Request PDF - ResearchGate, accessed on July 21, 2025, https://www.researchgate.net/publication/264004038_Export_Subsidy_Reforms_and_Productivity_Improvements_The_Case_of_the_Indian_Textile_and_Clothing_Sector

[94] The textile and clothing Industry: Adjusting to the post-quota world - Welcome to the United Nations, accessed on July 21, 2025, https://www.un.org/esa/sustdev/publications/industrial_development/2_2.pdf

[95] Nation's economic upgrading outpaces expectations despite global headwinds, accessed on July 21, 2025, https://www.globaltimes.cn/page/202507/1338705.shtml

[96] Indonesia Faces Deindustrialization: Beware of Rising Unemployment and Poverty, accessed on July 21, 2025, https://ugm.ac.id/en/news/indonesia-faces-deindustrialization-beware-of-rising-unemployment-and-poverty/

[97] Positive Adjustment against Protectionism: The Case of Textile and Clothing Industry in Hong Kong - Institute of Developing Economies, accessed on July 21, 2025, https://www.ide.go.jp/library/English/Publish/Periodicals/De/pdf/91_03_01.pdf

[98] Factory Jobs Elude U.S. Despite Biden Subsidies, Trump Tariffs - Virginia Business, accessed on July 21, 2025, https://virginiabusiness.com/us-manufacturing-biden-trump-tariffs-subsidies/

[99] Employment and value added in EU exports - an analysis with FIGARO data, accessed on July 21, 2025, https://ec.europa.eu/eurostat/statistics-explained/index.php/Employment_and_value_added_in_EU_exports_-_an_analysis_with_FIGARO_data

[100] The future of manufacturing in Europe - Eurofound, accessed on July 21, 2025, https://www.eurofound.europa.eu/system/files/2019-04/fomeef18002en.pdf

[101] wiiw Working Paper 106: State Aid and Export Competitiveness in the EU, accessed on July 21, 2025, https://wiiw.ac.at/state-aid-and-export-competitiveness-in-the-eu-dlp-3092.pdf

[102] Understanding the Impact of GSP Withdrawal on India's Top Exports to the US, accessed on July 21, 2025, https://www.orfonline.org/research/understanding-the-impact-of-gsp-withdrawal-on-indias-top-exports-to-the-us

[103] Manufacturing employment in China - Bureau of Labor Statistics, accessed on July 21, 2025, https://www.bls.gov/opub/mlr/2005/07/art2full.pdf

[104] Accelerating growth in Indonesia: An industrial policy for the rural informal sector | Brookings, accessed on July 21, 2025, https://www.brookings.edu/articles/accelerating-growth-in-indonesia-an-industrial-policy-for-the-rural-informal-sector/

[105] Pursuing Indonesia's 2030 Economic Goals and Sustainable Manufacturing: Stimulating through Industrial Revolution 4.0 - 65th ISI World Statistics Congress, accessed on July 21, 2025, https://www.isi-next.org/abstracts/submission/643/view/

[106] Assessing the Impact of Eliminating Export Subsidies in Bangladesh - ResearchGate, accessed on July 21, 2025, https://www.researchgate.net/publication/387918405_Assessing_the_Impact_of_Eliminating_Export_Subsidies_in_Bangladesh

[107] Energy Crisis, Firm Productivity, Political Crisis, and Sustainable Growth of the Textile Industry: An Emerging Economy Perspective - MDPI, accessed on July 21, 2025, https://www.mdpi.com/2071-1050/14/22/15112

[108] (PDF) Race in the Shipbuilding Industry: Cases of South Korea, Japan and China, accessed on July 21, 2025, https://www.researchgate.net/publication/350098911_Race_in_the_Shipbuilding_Industry_Cases_of_South_Korea_Japan_and_China

[109] Industrial Policy – Lessons from China - BSt Europe, accessed on July 21, 2025, https://bst-europe.eu/globalization/china-industrial-policy/

[110] Indonesia's Employment Strategy 2025–2029: Embracing Demographic and Green Transitions, accessed on July 21, 2025, https://training-indonesia.org/news/indonesia-s-employment-strategy-2025-2029-embracing-demographic-and-green-transitions

[111] IMF Working Paper 04/108: The End of Textile Quotas: A Case Study on the Impact on Bangladesh, by Montfort Mlachila and Yongzhen, accessed on July 21, 2025, https://www.imf.org/external/pubs/ft/wp/2004/wp04108.pdf

[112] Decoding China's Industrial Policies | NBER, accessed on July 21, 2025, https://www.nber.org/papers/w33814

[113] Impacts of Supply Chain disruptions due to Covid-19 on Strategies of Textile Industries - DiVA portal, accessed on July 21, 2025, https://www.diva-portal.org/smash/get/diva2:1701969/FULLTEXT01.pdf

[114] Manufacturing goes to Southeast Asia, and these four industries are growing fastest, accessed on July 21, 2025, https://www.octfgroup.com/p-672c72d0b0966

[115] The Office of Industrial Economics, accessed on July 21, 2025, https://www.oie.go.th/view/1/Home/EN-US

[116] Malaysia: Market Profile - HKTDC Research, accessed on July 21, 2025, https://research.hktdc.com/article/MzU4MDExMDI5

[117] Indonesia (IDN) Exports, Imports, and Trade Partners | The Observatory of Economic Complexity, accessed on July 21, 2025, https://oec.world/en/profile/country/idn

[118] 3 The Singapore Economy, accessed on July 21, 2025, https://www.mas.gov.sg/-/media/mas-media-library/publications/macroeconomic-review/2025/apr/mrapr25_chpt_3.pdf

[119] Industrial Development, Subsidy Reform and Export Behaviour: An Evidence from ASEAN-5 Economies - ResearchGate, accessed on July 21, 2025, https://www.researchgate.net/publication/334191355_Industrial_Development_Subsidy_Reform_and_Export_Behaviour_An_Evidence_from_ASEAN-5_Economies

[120] INDUSTRIAL SUBSIDIES AND THEIR IMPACTS ON EXPORTS OF TRADING PARTNERS: THE CHINA CASE, accessed on July 21, 2025, https://iit.adelaide.edu.au/ua/media/1440/wp03-industrial-subsidies-and-their-impact-on-exports-of-trading-partners.pdf

[121] 'We are dying': Adverse policies drive most textile millers to edge, say industry leaders, accessed on July 21, 2025, https://www.tbsnews.net/bangladesh/textile-mill-owners-demand-withdrawal-new-taxes-monday-1181511

[122] Publication: Evaluating the Case for Export Subsidies - Open Knowledge Repository, accessed on July 21, 2025, https://openknowledge.worldbank.org/entities/publication/07bf601b-d217-562b-bcda-246062dbbab0

[123] Beyond Rare Earths: China's Growing Threat to Gallium Supply Chains - CSIS, accessed on July 21, 2025, https://www.csis.org/analysis/beyond-rare-earths-chinas-growing-threat-gallium-supply-chains

[124] China's Economy May 2025: Slow Industrial Output, Resilient Consumption, accessed on July 21, 2025, https://www.china-briefing.com/news/chinas-economy-may-2025-cooling-industrial-output-resilient-consumption/

[125] Made in China 2025 | Merics, accessed on July 21, 2025, https://merics.org/en/report/made-china-2025

[126] The New Industrial Policy Landscape of East and Southeast Asia: Regional Launch of UNIDO Industrial Development Report 2024 and ADBI

Session on Green Industrial Policy | Asian Development Bank, accessed on July 21, 2025, https://www.adb.org/news/events/the-new-industrial-policy-landscape-of-east-and-southeast-asia-regional-launch-of-unido-industrial-development-report-2024-and-adbi-session-on-green-industrial-policy

[127] Will ASEAN's New Industrial Era Bring Growth or Division? - The Diplomat, accessed on July 21, 2025, https://thediplomat.com/2025/05/will-aseans-new-industrial-era-bring-growth-or-division/

[128] US, Mexico, Canada outline 5 initiatives to strengthen key ..., accessed on July 21, 2025, https://www.manufacturingdive.com/news/us-mexico-canada-outline-5-initiatives-to-strengthen-key-manufacturing-in/640106/

[129] Industrial Policies: Handle with Care; Staff Discussion Notes: SDN/2025/002 - IMF eLibrary, accessed on July 21, 2025, https://www.elibrary.imf.org/downloadpdf/view/journals/006/2025/002/006.2025.issue-002-en.pdf

[130] Detection and Impact of Industrial Subsidies: The Case of World Shipbuilding - National Bureau of Economic Research, accessed on July 21, 2025, https://www.nber.org/system/files/working_papers/w20119/w20119.pdf

[131] State Aid and Steel: How Much Are the Government's Hands Tied? - Edinburgh Europa Institute, accessed on July 21, 2025, https://europa.sps.ed.ac.uk/2016/02/17/state-aid-and-steel-how-much-are-the-governments-hands-tied/

[132] Thailand's Rising Role in ASEAN Supply Chains, accessed on July 21, 2025, https://www.aseanbriefing.com/news/thailands-role-in-asean-supply-chains-reshoring-realignment-and-risk-mitigation/

[133] Bringing Manufacturing Back: How Taxes and Tariffs Make an Impact - ISM, accessed on July 21, 2025, https://www.ismworld.org/supply-management-news-and-reports/news-publications/inside-supply-management-magazine/blog/2025/2025-07/bringing-manufacturing-back-how-taxes-and-tariffs-make-an-impact/

[134] RACE IN THE SHIPBUILDING INDUSTRY: CASES OF SOUTH KOREA, JAPAN AND CHINA - UM Journal, accessed on July 21, 2025, https://ejournal.um.edu.my/index.php/IJEAS/article/download/18797/10214/38765

[135] Uneven national implementation risks undermining EU state aid framework, metal markets warn - EUROMETAL, accessed on July 21, 2025, https://eurometal.net/uneven-national-implementation-risks-undermining-eu-state-aid-framework-metal-markets-warn/

[136] Steel market participants warn of risks in the new EU state aid program - GMK Center, accessed on July 21, 2025, https://gmk.center/en/news/new-eu-state-aid-program-will-depend-on-implementation-at-national-levels/

[137] Steel market participants warn of risks in the new EU state aid program - EUROMETAL, accessed on July 21, 2025, https://eurometal.net/steel-market-participants-warn-of-risks-in-the-new-eu-state-aid-program/

[138] Study finds electric vehicle subsidies help the climate and automakers – but at a cost, accessed on July 21, 2025, https://news.stanford.edu/stories/2024/10/electric-vehicle-subsidies-help-the-climate-u-s-automakers

[139] Recent Facts about Photovoltaics in Germany - Fraunhofer-Institut für Solare Energiesysteme ISE, accessed on July 21, 2025, https://www.ise.fraunhofer.de/content/dam/ise/en/documents/publications/studies/recent-facts-about-photovoltaics-in-germany.pdf

[140] Commission strengthens protection for EU steel industry, accessed on July 21, 2025, https://policy.trade.ec.europa.eu/news/commission-strengthens-protection-eu-steel-industry-2025-03-25_en

[141] PacNet #27 – With South Korea's help, can US shipbuilding catch up with China? - Pacific Forum, accessed on July 21, 2025, https://pacforum.org/publications/pacnet-27-with-south-koreas-help-can-us-shipbuilding-catch-up-with-china/