INDUSTRIAL POLICY IN THE GREEN TRANSITION ERA: DEVELOPMENT AND IMPLEMENTATION EXPERIENCES FROM EAST AND SOUTHEAST ASIA

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Summary

This study analyzes the design and implementation of industrial policy in selected developed and developing economies to inform strategies for structural transformation in the global green transition. Using secondary data, it compares policy trajectories in Japan, Singapore, and South Korea with those in Malaysia, Thailand, Indonesia, and Viet Nam. The findings show that advanced economies employ mission-oriented policies to secure technological leadership, supply-chain resilience, and green competitiveness, supported by strong institutions, coordinated R&D, and targeted financing. Developing economies, operating under tighter fiscal and administrative constraints, use industrial policy as an upgrading pathway, shifting from import substitution to export orientation while increasingly integrating low-carbon development. The study argues that effective industrial policy requires clear priorities, coherent regulatory and financial instruments, public–private collaboration, and performance-based discipline. It recommends selective and time-bound support tied to measurable results, strengthened supplier upgrading and export readiness programs, co-financing for skills and innovation, and improved evaluation mechanisms to reallocate resources toward high-impact interventions.

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INTRODUCTION

Industrial policy (IP) refers to government interventions that deliberately target specific economic activities to promote long-term national benefits. While traditionally associated with enhancing manufacturing competitiveness, its scope has expanded to include innovation, productivity, quality employment, climate transition, and economic resilience (Tagliapietra & Veugelers, 2023). The concept of "New Industrial Policy" reflects this shift, emphasizing long-term social welfare and the balance between competitiveness, inclusivity, and sustainability (Lane, 2019). As Juhász, Lane, and Rodrik (2023) argue, industrial policies are state strategies that reshape economic structures in pursuit of broad public goals. The recent resurgence of IP is driven by climate change, technological disruption, and geopolitical shifts, moving the debate from whether to intervene toward how to intervene effectively through adaptive, transparent, and performance-based frameworks.

According to Altenburg & Rodrik (2017), effective modern IP is grounded in three principles: (i) Embeddedness: Close yet autonomous state–business collaboration, consistent with Evans' (1995) notion of "embedded autonomy"; (ii) Discipline: Conditional and performance-based support to prevent inefficiency; and (iii) Accountability: Transparency and institutional checks to limit corruption and rent-seeking. Contemporary industrial policy is thus less about rigid "picking winners" and more about coordinating resources, fostering learning, and strengthening institutional capacities. It acknowledges that markets alone cannot deliver long-term structural transformation, making targeted and accountable state intervention essential for sustainable development.

INDUSTRIAL POLICY IN DEVELOPED COUNTRIES

Japan

Japan's recent industrial policy, as discussed in Armstrong et al. (2024), pursues 2 core objectives: strategic autonomy-reducing dependence on external sources for critical goods-and strategic indispensability-strengthening Japan's position in essential and emerging technologies.

The Economic Security Promotion Act (ESPA) established legal frameworks for supply chain resilience, critical infrastructure protection, public–private R&D collaboration, and safeguarding sensitive technologies. Financial commitments totalled ¥3.9 trillion (US$25.5

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billion), supporting major initiatives such as TSMC's Kumamoto plant and the Rapidus project in Hokkaido. Additional measures included tighter investment screening, expanded export controls, and coordinated actions with partners like the United States and the Netherlands.

Japan has strengthened institutional foundations and attracted major investments, yet dependence on China for key inputs-rare earths, batteries, and some semiconductors-has increased. The commercial viability of projects such as Rapidus is uncertain, and SME participation in the economic security agenda remains limited. Overall, Japan's strategy is ambitious but constrained by structural challenges and persistent external dependencies.

Singapore

Singapore's industrial policy has consistently aimed to sustain a dual-engine economy driven by manufacturing and services. The Strategic Economic Plan (1991) and Manufacturing 2000 Programme sought to maintain manufacturing's share at around 25% of GDP and prevent industrial decline by upgrading technological capabilities.

The 2003 Economic Review Committee advanced this agenda by promoting economic diversification, innovation, and entrepreneurship. Policies focused on simultaneously attracting MNCs and nurturing domestic firms through enhanced R&D capacity, technology adoption, and ecosystem development.

Results were mixed, electronics and chemicals became highly competitive and drew substantial FDI, while shipbuilding declined due to rigid policies and missed opportunities. Singapore made meaningful progress toward a knowledge-based economy, improving export sophistication and establishing globally competitive economic clusters.

South Korea

South Korea's industrial policy in the 1960s and 1970s effectively mitigated private-sector hesitation toward large-scale investment. The state initially relied on state-owned enterprises in capital-intensive sectors such as electricity, airlines, shipbuilding, and steel (World Bank, 2014). Private firms in targeted industries received extensive subsidies - cash transfers, tax incentives, import controls, and preferential foreign exchange access (Kim & Leipziger, 1993)-which helped offset political and financial risks. Massive public infrastructure investment further raised returns to private capital.

Korea's success stemmed from strategic industry targeting, strong institutional capacity, and credible governance. Institutional reforms, notably the establishment of the Economic Planning Board and civil service professionalization, enhanced bureaucratic effectiveness and policy consistency. Complemented by substantial public investment in infrastructure and R&D, the state lowered barriers for private sector development and fostered technological upgrading. A stable, long-term commitment to industrialization - reinforced by a mutually dependent relationship with chaebols - aligned public and private interests and enabled Korea's sustained structural transformation.

INDUSTRIAL POLICY IN DEVELOPING COUNTRIES

Malaysia

Malaysia's industrial policy has evolved through several distinct phases, each reflecting the country's shifting priorities in economic development and integration into global value chains. In the Colonial era, policy centered on resource extraction, particularly rubber and tin, which formed the backbone of the economy (Bethuel, 2017). Following independence, from 1957 to 1970, the focus shifted to import substitution industrialization, with textiles, electronics, and vehicle assembly as the main industries, supported by tariff protection and state-led initiatives (Bethuel, 2017). Between 1971 and 1985, the New Economic Policy (NEP) marked a turning point: Malaysia embraced export-oriented industrialization while simultaneously pursuing socio-economic restructuring. During 1986-2000, under Mahathir's "Look East Policy," Malaysia prioritized heavy industries and sought to emulate East Asian industrial success models (Bethuel, 2017). Since 2001, industrial policy has emphasized high technology, digitalization, and sustainable development, as laid out in successive industrial master plans such as IMP3 and NIMP 2030 (MITI, 2023).

The key objectives of Malaysia's industrial policy were multifaceted. At the economic level, policies aimed to accelerate growth and diversify the economy away from primary commodities such as palm oil and rubber (Bethuel, 2017). Socially, industrial policy was explicitly tied to poverty reduction and the redistribution of wealth through greater Bumiputera equity and entrepreneurship (Thillainathan & Cheong, 2016). Malaysia also sought to raise domestic value addition in its resource-based sectors and attract sustained FDI inflows to expand its manufacturing base (Lebdioui, 2021).

In terms of results, Malaysia's industrial policies delivered notable achievements. The manufacturing sector's share of GDP rose from 13.4% in 1970 to around 23% in 2023 (Bethuel, 2017). The E&E sector became the country's largest export contributor, reaching RM 593 billion in 2022 (Lebdioui, 2021). Socially, poverty rates fell sharply, and unemployment declined from 8.3% in 1985 to 3.4% in 2023 (Thillainathan & Cheong, 2016). However, significant challenges persist. Despite NEP reforms, ethnic and regional income inequality has not been fully resolved. Malaysia remains heavily dependent on FDI for manufacturing growth, with SMEs contributing only around 38% of GDP (MITI, 2023). Innovation capacity is constrained by low R&D spending (~1.4% of GDP), while governance issues such as inefficiency in government-linked companies and political patronage have occasionally undermined competitiveness (Lebdioui, 2021).

Looking ahead, Malaysia's future plans are crystallized in the New Industrial Master Plan (NIMP) 2030. The plan seeks to enhance economic complexity, accelerate digital transformation, achieve net-zero emissions, and promote inclusivity (MITI, 2023). Priority areas include attracting global semiconductor wafer fabrication, advancing AI and smart factory adoption, and fostering green technologies. Socially, there is an emphasis on increasing Bumiputera and female participation in high-skilled sectors. Implementation strategies revolve around closer coordination between federal and state governments, upgrading technical and vocational education, reducing reliance on foreign capital, and strengthening the competitiveness of local firms (Thillainathan & Cheong, 2016). Together, these measures illustrate Malaysia's ambition to move beyond its reliance on resource-based and export-assembly models and reposition itself as a resilient, innovation-driven industrial economy.

Thailand

Thailand's industrial policy has been highly dynamic, evolving through successive phases of import substitution, localisation, export orientation, and international competitiveness. From the 1960s to 1970, policy was driven by import-substituting industrialisation (ISI), where the government sought to establish domestic vehicle assembly for the local market. This was achieved through high tariffs on completely built-up (CBU) vehicles while offering lower duties on completely knocked-down (CKD) kits, incentivising foreign automakers to establish assembly operations in Thailand.

By the late 1970s-1980s, these policies were reinforced through highly interventionist measures such as the import ban on CBU passenger vehicles (1978–1991). After the 1997 Asian financial crisis, Thailand embraced liberalisation under the WTO framework, but carefully retained selective protection for strategic objectives.

Since the 2000s, policy has increasingly focused on international competitiveness and industrial deepening. The government identified "product champions" such as pick-up trucks and eco-cars, launching the Eco Car project in 2007 to promote fuel-efficient vehicles. Moreover, Thailand invested in human capital development through initiatives like the Automotive Human Resource Development Project (AHRDP), carried out in collaboration with Japan, to strengthen workforce capabilities for advanced automotive manufacturing.

By 2010, Thailand ranked as the 12th largest vehicle producer worldwide, manufacturing 1.6 million units with a 2.1% global share. Localisation policies successfully established a strong parts supply base by 1994, pick-up trucks had reached 72% local content. Export promotion transformed Thailand into a global hub, with vehicle exports soaring from negligible levels in the 1980s to 895,855 units in 2010, surpassing domestic sales. A robust automotive cluster emerged, comprising over 2,300 part suppliers by 2010, complemented by extensive local procurement and the establishment of R&D centres.

Looking ahead, Thailand's future plans are anchored in the transition to electric vehicles (EVs) and green growth. Policy instruments include consumer subsidies, tax reductions, import duty exemptions, and generous Board of Investment (BOI) incentives under the "EV 3.0" and "EV 3.5" schemes. These initiatives are embedded in the broader "Thailand 4.0" strategy, which seeks to reposition the country as an innovation-driven economy, with next-generation automotive and EVs as core "S-curve industries." In parallel, Thailand is advancing a green transition through the Bio-Circular-Green (BCG) Economy Model, aiming to integrate sustainability, circularity, and technological innovation into its industrial base. Altogether, Thailand's industrial policy reflects a pragmatic blend of protection, liberalisation, and forward-looking transformation, enabling it to consolidate its status as a regional automotive powerhouse while preparing for the EV era.

Indonesia

Indonesia's industrial policy has evolved in waves, shifting between state-led intervention and liberalization as national priorities changed. Following post-1966 stabilization, the 1970s–early 1980s oil boom enabled protectionist import substitution in base metals, petrochemicals, and automotive parts. From the mid-1980s to 1997, policy turned toward structural adjustment and export orientation. In the 2000s, long-term plans such as the National Industrial Policy (2008), MP3EI (2011), and the 2013 Industrial Bill re-emphasized domestic value-added, technological deepening, and mineral "downstreaming" in nickel, copper, bauxite, and steel. Instruments ranged from tariffs, local-content rules, and SOE support to trade and investment liberalization, exporter incentives, and more recent trade taxes, tax holidays for pioneer industries, and renewed local-content requirements. Recent ore-export bans have spurred smelter investment and FDI in the EV battery chain but raise questions about sustainability and spillovers. Indonesia's current strategy blends assertive resource-based downstreaming with selective openness, aiming to secure domestic value-added and technological upgrading despite persistent structural constraints.

Persistent structural headwinds: labor-market instability, human-capital gaps, weak innovation and low R&D still constrain upgrading. Even so, Jakarta is intensifying the use of industrial policy, doubling down on hilirisasi (downstream industrialization) in minerals, signaling plans to extend the model to bauxite and copper, and grafting green-economy elements onto the EV ecosystem. In short, Indonesia's approach blends assertive resource-based downstreaming with selective openness. This is an ambitious attempt to lock in domestic value-added and climb technologically while managing the risks inherent in commodity-anchored industrialization.

INDUSTRIAL POLICY IN VIET NAM: CURRENT REALITIES AND LESSONS LEARNED

Viet Nam's industrial policy

Viet Nam's economic trajectory since the Doi Moi reforms in 1986 presents a compelling yet complex case of industrial development. While the country has achieved remarkable results in economic growth and poverty reduction by gradually shifting from a centrally planned to a market-based economy, it now faces significant challenges in sustaining this momentum and achieving deeper structural transformation (Masina, 2010). The nation's industrial policy has often been characterized by a pragmatic, yet sometimes incoherent, blend of neoliberal principles and developmental state approaches. This has resulted in a dualistic industrial structure heavily reliant on state-owned enterprises (SOEs) and foreign direct investment (FDI), while lacking a consistently implemented, long-term strategic vision for fostering indigenous capabilities (Masina, 2010; Vu-Thanh, 2017).

A primary challenge confronting Viet Nam is its deep dependence on foreign-led integration into the regional economy. While FDI has been a powerful engine for job creation and export growth, industrial activities remain largely dominated by foreign firms, confining Viet Nam to lower value-added segments of global supply chains (Ohno, 2008). Concurrently, the state sector continues to receive preferential treatment, particularly in access to credit and land, which creates an uneven playing field and hinders the competitiveness of the domestic private sector (Vu-Thanh, 2017). This dynamic is exacerbated by persistent weaknesses in the policymaking process, which often lacks sufficient inter-ministerial coordination and meaningful involvement of the business community, leading to unimplemented or ineffective industrial strategies (Ohno, 2008). The trade policy regime, despite significant reforms, can still produce an anti-export bias against domestic firms that are not integrated into FDI-led production networks (Athukorala, 2005). Collectively, these issues place Viet Nam at risk of the middle-income trap, where growth stagnates as the country struggles to transition from being driven by factor accumulation to being driven by innovation and internal value creation (Ohno, 2008).

Key policy frameworks include the Industrial Development Strategy to 2025–2035, the Law on Investment, and incentives for high-tech enterprises, supporting industries, and green industrialization. Outcomes show rapid manufacturing growth and export diversification driven largely by FDI, though domestic firms remain weak in technological capabilities and value-chain positioning. Current policy aims to strengthen supporting industries, enhance human capital, foster innovation, and reduce reliance on low-value assembly by promoting higher productivity, green technologies, and deeper enterprise linkages.

Lessons learned for Viet Nam in designing comprehensive and effective industrial policy

The comparative analysis of industrial policy across East and Southeast Asia reveals divergent strategic objectives yet convergent design principles. Developed economies deploy mission-oriented policies to secure technological leadership, supply chain resilience, and the green transition, underpinned by significant financial commitments and robust institutional frameworks. In contrast, developing economies utilize industrial policy primarily as a ladder for structural transformation, aiming to diversify beyond low-value-added activities under tighter fiscal and administrative constraints.

A unified reading of developed and developing country experiences reveals divergent objectives but convergent design principles in industrial policy. Advanced economies such as the Japan, Singapore, and South Korea increasingly deploy mission-oriented strategies to secure technological leadership, enhance supply chain resilience, and drive the green transition. These approaches combine large-scale financial commitments, targeted subsidies, coordinated R&D programs, and robust institutional architectures designed to promote strategic autonomy. For example, the EU has consolidated leadership in renewable energy and electric mobility, Japan has prioritized semiconductor security through legal and financial packages, while Singapore and South Korea exemplify the effectiveness of long-term planning and performance-based support to rapidly transition from labor-intensive to high-technology industries.

By contrast, developing economies such as Thailand, Malaysia, and Indonesia employ industrial policy primarily as a ladder for structural transformation, aimed at escaping low-value-added traps under fiscal and administrative constraints. Thailand's automotive sector showcases a sequenced strategy from import substitution to localization and eventually electric vehicle development while Malaysia's export-led industrialization generated rapid growth but exposed vulnerabilities in FDI dependence and insufficient innovation. Indonesia's resource-based downstreaming in minerals and EV batteries demonstrates the potential of industrial policy to attract investment yet highlights persistent challenges in technological capabilities and institutional capacity.

Despite these different stages of development, common lessons emerge. Successful outcomes hinge on the ability to focus on a limited number of priority sectors, coherently align financial and regulatory tools, and embed state-business coordination within performance-based frameworks. Developed economies show how industrial policy can expand technological frontiers, whereas developing economies demonstrate its role in building domestic capabilities and diversifying production. Ultimately, the determinants separating sustained industrial transformation from temporary gains are focus, scale, and credible institutions.

The experiences of the developed and developing economies examined in this study offer several crucial lessons for Viet Nam as it formulates its industrial strategy for the green transition era, such as:

First, there is a clear need to move towards a more coherent, mission-oriented industrial policy. Rather than pursuing ambiguous and sometimes conflicting objectives, Viet Nam can learn from the strategies of Japan and South Korea, which focused on securing technological leadership and supply chain resilience through coordinated, long-term programs supported by strong institutions and targeted finance. Such a strategy would require identifying concentrated priorities and ensuring a coherent alignment of regulatory and financial instruments to achieve them (Rodrik, 2004).

Second, effective policy design and implementation hinge on strengthening state-business collaboration. The success of East Asian industrialization was not merely a top-down process but was rooted in an "embedded autonomy" framework featuring strong, iterative collaboration between the state and the private sector (Evans, 1995; Vu-Thanh, 2017). For Viet Nam, this implies fostering institutional mechanisms that allow for a continuous dialogue with the private sector to identify binding constraints, co-design solutions, and ensure that government interventions are responsive and accountable. This requires moving beyond a top-down approach and building trust and institutional capacity for genuine public-private partnership (Ohno, 2008).

Third, while FDI remains critical, a more strategic focus on nurturing domestic capabilities is essential for sustainable upgrading. As observed in developing Asian economies, industrial policy can serve as a ladder for capability deepening. This entails implementing selective, time-bound support linked to measurable outcomes for domestic firms, expanding supplier upgrading programs, and co-financing skills development in adjacent technologies. Critically, as seen in the case of South Korea, government support must be linked to firm performance, especially export achievements, to incentivize efficiency and limit rent-seeking (Kim & Leipziger, 1993). By adopting these lessons, Viet Nam can navigate its current challenges and transition from a factor-driven to an innovation-driven growth model, securing its long-term prosperity in an increasingly green global economy.

CONCLUSION

Viet Nam's experience illustrates both the potential and risks of an FDI-led, assembly-based growth model. Despite strong growth and export expansion, the country remains dependent on foreign investment, with limited domestic value capture and fragmented policy implementation, risking the middle-income trap. Transitioning toward a mission-oriented industrial strategy-focusing on targeted sectors, stronger institutional coordination, performance-linked incentives, and public-private collaboration-is critical for upgrading in global value chains.

Beyond macroeconomic stability, infrastructure, and human capital, Viet Nam needs targeted microeconomic interventions to address firm-level constraints, including weak technology absorption, limited finance access, and underdeveloped innovation ecosystems. Resource allocation should prioritize sectors with the highest learning potential, supported by clear performance metrics and adherence to international trade rules. Export promotion, supplier upgrading, R&D co-funding, and industrial clustering can foster competitiveness without resorting to protectionism.

In sum, disciplined, adaptable, and well-governed industrial policy can help Vietnam avoid the middle-income trap, facilitate the green transition, and achieve sustainable long-term prosperity.

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