

Introduction to *A Modern Guide to Industrial Economics*

Francesca Spigarelli, Lorenzo Compagnucci and Dominique Lepore

Recent global trends and events, including the pandemic, rising geopolitical tensions and accelerating climate change, have underscored the extent to which contemporary socio-economic systems are becoming increasingly unstable, tightly interconnected and more exposed to systemic shocks. In such a context, the complexity of industrial transformation demands analytical tools and interpretative frameworks in order to support adaptation and resilience of socio-economic systems.

Industrial economics offers a foundation for understanding these dynamics. In particular, traditional industrial economics focused on market structure, firm behaviour and competition and technological change. While these remain essential foundations, they no longer provide a sufficient lens for comprehending today's rapidly evolving industrial systems and economic actors within them. Along with the unpredictability and instability, the diffusion of advanced technologies, the acceleration of digitalisation and the growing importance of sustainability require a broader and more integrated perspective.

Indeed, current industrial challenges involve not only analysing how firms compete and innovate, but also understanding how institutions coordinate actors, correct market and system failures, and manage technological trajectories. Thus, industrial policy has become central to addressing capability gaps, reducing regional disparities, managing structural transitions and promoting sustainable forms of industrial development. This means that analytical understanding alone is insufficient and that, instead, policy interventions are necessary to translate economic insights into effective strategies.

However, there is no universal model of industrial policy that can be applied across diverse contexts. The interaction between industrial economics and industrial policy is deeply influenced by regional, national and sectoral specificities. Tools that succeed in one environment may fail in another, offering valuable lessons about the importance of institutional conditions, governance

structures and local capacities. In this sense, failures are not merely obstacles but can inform the design of more effective policy approaches.

Within this evolving scenario, this book aims to provide a modern guide to industrial economics, with emphasis on how industrial policies are redefining its objectives, boundaries and applications. By examining the interplay between economic analysis and policy instruments, this volume offers a comprehensive understanding of how industrial systems can navigate uncertainty, tap into technological change and achieve sustainable, inclusive and resilient forms of development.

THE EVOLUTION OF INDUSTRIAL POLICIES

Industrial policy has been defined in several ways over time, and these definitions have evolved in response to changing technological, economic and social conditions. The concept of industrial policy has generated divergent views among economists and policymakers. Although some authors argue that government intervention distorts competition and should be kept to a minimum (Mill, 1848; Smith, 1776), others emphasise the essential role of the state in guiding structural change, protecting strategic sectors and promoting national development (Keynes, 1936). These opposing traditions have shaped how countries interpret and implement industrial policy, contributing to the diverse models of industrial organisation across today's global economy.

The *laissez-faire* approach is rooted in the classical liberalism of Adam Smith (1759; 1776), who introduced the metaphor of the “invisible hand” to explain how individuals pursuing their own interests may, unintentionally, contribute to the public good. Later, John Stuart Mill formalised *laissez-faire* as a guiding principle for economic policy, arguing that deviations from it should occur only when clearly justified by substantial public benefit (Mill, 1848).

Oposing this view, there is a tradition that places the state at the centre of economic development. This perspective is strongly connected to the work of John Maynard Keynes, who argued that markets do not automatically self-correct during crises and that government intervention is necessary to stabilise employment, stimulate demand, and direct investment towards socially beneficial outcomes (Keynes, 1936). The Keynesian approach deeply influenced post-war industrial strategies, inspiring large-scale public programmes aimed at promoting economic restructuring and stability.

In recent years, industrial policy has regained prominence in response to multiple crises from the 2008 financial collapse to the COVID-19 pandemic and to the emergence of advanced technologies, requiring coordinated public action. Growing concerns over climate change, social inequality and geopolitical instability have expanded the objectives of industrial policy beyond

competitiveness or sectoral growth. Instead, contemporary strategies increasingly aim to support sustainability, inclusiveness and resilience (Juhász et al., 2023; Stiglitz, 2017).

This shift is reinforced by the technological transformations associated with Industry 4.0 technologies, including artificial intelligence, cloud, big data and digital platforms. These technological advancements reshape production processes, business models and value chains (Compagnucci et al., 2025). While these technologies offer new opportunities, they also create complexity, uncertainty and risks of exclusion for firms and workers lacking the capabilities to adapt. Moreover, the Industry 4.0 paradigm has been criticised for not adequately addressing environmental and social sustainability, focusing mainly on efficiency and technological optimisation. These limitations have contributed to the shift toward the Industry 5.0 paradigm, which places human well-being, sustainability and resilience at the centre of industrial transformation. Industry 5.0 builds on lessons learned during the pandemic, emphasising the need for robust value chains, social protection and alignment with planetary boundaries (Renda et al., 2021). In such a changing context, there is a need for a broad and flexible understanding of industrial policy.

The geopolitical tensions between the US and China within the so-called “tech war” have further contributed to reshaping the role and goals of industrial policies to promote national growth and access to key resources for global supremacy (Sampaolo et al., 2026).

Similarly, other countries have launched ambitious mission-oriented policy to protect industry and national autonomy (Mariotti, 2025). The recent literature highlights a growing convergence between industrial policy and geopolitics, framed under the rubric of “New Economic Statecraft” (Aggarwal and Reddie, 2021). Building on classic definitions of statecraft as the strategic use of multiple policy instruments to pursue core national objectives (Baldwin, 1985; Mastanduno, 1998), contemporary scholarship emphasises how economic and industrial tools now complement military and diplomatic means in advancing security, prosperity and international influence. In particular, work in international political economy shows that the “high politics” of security increasingly encompasses efforts to build domestic capabilities in the design and production of critical technologies (Aggarwal and Reddie, 2020; Weiss and Thurbon, 2021). This is reflected in the re-emergence of industrial policy in Western economies, which is deployed to address “securonomics” concerns over supply-chain resilience, to manage or reduce strategic dependence on China, and to secure control over key technologies underpinning the digital and green transitions (Bailey et al., 2023; De Propriis, 2024).

Thereby, economic, social and environmental objectives have to become part of industrial policies to govern deep transformations across industry,

the economy and society (Cardinale and Scazzieri, 2019; Kerr and Scazzieri, 2013) for structural change (Di Tommaso et al., 2021).

RETHINKING INDUSTRIAL ECONOMICS IN AN ECOSYSTEM PERSPECTIVE

To ensure that industrial economics and industrial policies offer real and timely responses to current challenges, an ecosystem approach is considered necessary (Burström et al. 2024; OECD, 2025). Although the ecosystem concept originated in biology, it has become a central analytical lens in contemporary economics. In fact, industrial ecosystems have become relevant for emphasising sectoral coordination and interactions along value chains, and for focusing on increasing value added within specific industries (OECD, 2025). Such ecosystems interact with many others, including knowledge, entrepreneurial, business and innovation types. Indeed, ecosystems vary widely in their organisation, specialisation, governance and network intensity, making their boundaries and characteristics difficult to define with precision (Compagnucci et al., 2026a). They also differ in terms of focus, expected outputs and degrees of openness, although in practice these distinctions are often blurred and overlapping (Compagnucci et al., 2026b). Among them, innovation ecosystems have become especially prominent, reflecting growing interest in how universities, firms, institutions and other stakeholders collaborate to generate, diffuse and commercialise new knowledge (Granstrand and Holgersson, 2020).

From a policy perspective, however, an important gap remains between the growing body of research on ecosystems and its application in policymaking. Despite the increasing relevance of ecosystem-based approaches, policy design often lacks a clear conceptual foundation and fails to fully leverage ecosystem dynamics. A more policy-oriented research agenda, which should be validated and informed by policymakers, is therefore necessary to ensure that academic insights support policy development and implementation (Hess et al., 2025).

In this context, industrial economics and industrial policy should offer frameworks for interpreting the complex interactions among diverse actors operating at local, regional, national and global scales. Such frameworks should account for the distribution of resources and knowledge across these actors and support coordinated responses to structural change (Compagnucci, 2022), technological transitions and the broader societal challenges that define contemporary industrial transformation.

THE STRUCTURE OF THE BOOK

The book *A Modern Guide to Industrial Economics* offers an overview of the latest theoretical frameworks and applications of industrial economics at

different levels and latitudes. This book aims to bridge academic theories and practical insights, analysing how and to what extent policies, firms and markets influence economic activities across countries and sectors at both regional and global levels. The book suggests a selection of new perspectives on industrial economics (Part I), and offers insights into actors, places and industries (Part II). Authors across the globe were invited to contribute based on their extensive experience in the relevant field of research and their collaboration with firms and governmental agencies. They provided a variety of perspectives, ideas and suggestions.

Part I revisits the theoretical foundations of industrial policy, outlining core definitions, conceptual frameworks, orientations and recent developments. It offers a modern view of how industrial policy evolves to address current economic, technological, environmental and societal challenges.

In Chapter 2, Di Tommaso, Barbieri and Rubini review the evolution of industrial policies and propose a “just” industrial policy perspective. They argue that industrial policy should explicitly pursue normative social goals such as equity, human development and inclusion.

Chapter 3, by Spigarelli, Compagnucci and Lepore, examines how industrial policies intersect with the evolution of innovation ecosystems, with particular attention to the European Union’s recent policies that were enacted to pursue open strategic autonomy and technological sovereignty. The authors show how innovation ecosystems respond to diverse crises by leveraging collaborative frameworks that mobilise human, social, intellectual and financial capital across value chains and sectors.

In Chapter 4, McIntyre and Hoadley analyse the shift from episodic industrial interventions to industrial policy as a structural feature of modern economic governance. They situate the resurgence of industrial policy in the United States, China and the European Union within a broader historical and theoretical context.

Chapter 5, by Petti, explores the role of technological change in shaping industrial policy, revisiting its theoretical foundations and clarifying debates surrounding the economic effects of technology. These dynamics are illustrated through the case of East Asian catching-up and upgrading strategies.

In Chapter 6, Bui introduces the concept of Resilience-by-Design, reframing national progress as the strategic co-evolution of industrial policy and diplomacy. Building on Vietnam’s adaptive development trajectory, the chapter illustrates how resilience can emerge from intentional design.

Part II provides a wide picture of trends, facts and challenges related to specific actors, places, and industries, as well as policies enacted to protect, promote, shape economic growth, resilience, and competitiveness.

Chapter 7, by Costa, Crupi, Lepore and Marinelli, explores the European context of industrial policies addressing the digital transformation of small

and medium-sized enterprises. The chapter focuses on the role of digital innovation hubs as innovation intermediaries that act as knowledge brokers across multiple regional innovation ecosystems.

Chapter 8, by Sica, Spiniello, Micozzi and Palazzo, investigates the Italian context, showing how digital, green and knowledge-intensive entrepreneurship is driving ongoing industrial transformation. Their analysis contributes to theoretical debates by offering insights for inclusive, innovation-driven policy interventions.

Chapter 9, by Giannini, Iacobucci and Orci, analyses the adoption of blockchain technology in the agri-food and fashion industries within a European perspective. The authors identify structural and organisational barriers to blockchain diffusion as well as enabling conditions that could support broader adoption. This chapter suggests a selection of implications to inform the design of more effective interventions that facilitate meaningful and sustainable adoption of blockchain technology.

In Chapter 10, Mucelli examines the evolution of the yachting industry as one of the most advanced segments of the maritime sector. Through a case study of an Italian tech firm, the author shows how the competitive advantage of firms in this sector depends on brand heritage, artisanal craftsmanship and, increasingly, on their capacity to incorporate advanced technologies.

In Chapter 11, Styan analyses how industrial policies targeted at major ports and maritime industries influence competitiveness and long-term development. The study is carried out by focusing on UK government interventions.

Chapter 12, by Bortoluzzi, Lunkes, Monteiro and Silva da Rosa, investigates the case of Brazil and the agri-food industry. It assesses how and to what extent management practices can support open eco-innovation to reduce grain loss and limit water and energy waste. The authors test their hypotheses using data from a sample of the country's largest grain firms.

The following three chapters deepen the analysis of the semiconductor industry, which is one of the key areas where states are implementing industrial policies to strengthen their competitiveness.

In Chapter 13, Sampaolo shows China's strategic push for semiconductor sovereignty amid intensifying geopolitical pressures. The chapter offers a new framework for understanding industrial economics in an era of statecraft.

Chapter 14, by Yongshin, provides a complementary East Asian perspective. It demonstrates how regional economies have developed distinct industrial policy approaches to navigate the global semiconductor landscape shaped by the US–China chip conflict.

The Japanese case is explored in Chapter 15 by Miura, who compares traditional industrial policies with recent approaches, with a focus on the semiconductor and cloud services sectors. The chapter argues that Japan's renewed

interest in industrial policy is linked to structural challenges like persistent deflation and stagnation as well as rising concerns over economic security.

Finally, in Chapter 16, Wang, Zhao and Wu analyse the co-evolution of industrial policy and ecosystem development in China's new energy vehicle sector. The authors highlight how policy adaptability shapes technological progress, market entry, demand formation and infrastructure development.

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