

Introduction

Maria Letizia Giorgetti

University of Milan

ORCID: 0000-0001-5544-1952

Lorenzo Zirulia

University of Milan

ORCID: 0000-0002-2876-2037

DOI: 10.54103/milanoup.180.c265

1. The aim of this book

The ultimate aim of this book is to suggest different points of view on the impact of various dimensions of digital transition on industrial policy's challenges.

Relying on contributors with different backgrounds, from academia to the public and private sectors, the book emphasizes two topics that we deem as crucial to inform and motivate industrial policies in current times: namely, the reorganization of the (global) value chains (in which the digital dimension is key), and the role of infrastructures to store data for business.

Industrial policy has become central in the public debate after several years of neglect, during which most authors have criticized any sort of state intervention in markets, with the possible exception of competition policy. The mood now has shifted, with leading economists such as Philippe Aghion, Dani Rodrick and Mariana Mazzucato exploring the possibility of combining industrial policy with efforts to enhance competitiveness. The main current challenges for industrial policy are threefold: i) green and energy transition; ii) digital transition; iii) the dependence on critical raw materials. All of these three challenges are closely interconnected. While our focus lies on digital transition, we are aware that digital and green transition have to proceed together, by taking into account the lack of raw critical material for Europe and the need of dealing with strong competition from China and United States. There is a need for a collective effort, which may vary depending on different perspectives. This book aims to contribute to the debate, regardless of specific ideological viewpoints.

2. The content of this book: summary of individual chapters

The book is organized in two parts.

Digital transition and value chains - The first part, comprised of five chapters, touches several points related to value chains, and how these are undergoing reorganizations due to factors related to digital transition, such as artificial intelligence, cloud computing, Internet of Things, blockchain, the metaverse and the increasing role of B2B and B2C platforms.

Chapter 1 by Cappelli et al. focuses on a new empirical methodology, Atheoretical Regression Trees (ART), to provide a representation of all the Italian manufacturing sector based a rich ISTAT database. Such a representation is a key starting point to understand challenges for industrial policy, as firm size distribution impacts on the design of successful actions to manage transitions or contrast companies' and sectors' crises.

While the previous chapter employs the standard ATECO industrial classification, recent developments try to overcome its limit by adopting a value chain approach. In that respect, Chapter 2 by Alessandro Faramondi presents the state of the art in value chains classification, providing a synthesis of potential advantages (and limits) of such an approach. The analysis builds on the effort of the Italian National Institute of Statistics (ISTAT) to create an alternative framework, where linkages among companies across different sectors are explicitly spelled out.

Another important contribution comes from Mirko Bragagnolo, who, in Chapter 3, emphasizes the importance of digitalization for Small and Medium Enterprises in a global value chain: «In a market that demands high quality and product customization, flexible production and speed of execution, digitalization is the key to competitiveness.» Bragagnolo points out that a supply-chain based digital strategy must be developed for a business to succeed.

In Chapters 4 and 5, Tiziana Vallone and Carlo Alberto Carnevale Maffè respectively put forth two important contributions on the role of digitalization of global value chains.

In Vallone's chapter, the focus is based on the diffusion of IT systems capable of synchronizing supply network data with collaborative planning, processes and procedures to reduce unforeseen events and disruptions. The necessity to make quick decisions can be easily satisfied by digital data. The ability to process information quickly allows for adjustments to decisions and strategies in response to an increasing number of destabilizing factors around the world, both in geopolitical and economic dimensions. Business intelligence, data analytics and artificial intelligence can help to solve the logistics problems that are paramount in the process of huge redefinition of global values chains.

In his chapter, Carnevale Maffè analyzes the added value of the industrial metaverse. The industrial metaverse is a virtual environment in which companies can duplicate and manage their activities throughout the value chain. The industrial metaverse includes several key technologies, including digital twins, augmented and virtual reality, and artificial intelligence. The Metaverse enables the simulation and monitoring of industrial activities, helping to reduce risks, costs, and time while enhancing efficiency, quality, and security.

Digital transition and technological infrastructures - the second part of the book, also comprised of five chapters, is dedicated to the role of technological infrastructures. The first two chapters of this part set the stage for well-informed debate. Chapter 6 by Maria Fazio provides an overview of all the (interconnected) technological challenges for digital transition: cloud and edge computing, artificial intelligence and blockchains. Fazio demonstrates that while the digital transition presents significant opportunities for many companies, its disruptive nature should not be underestimated. Chapter 7 by Adriana Lotti focuses on Italy and its policies for digital transitions, providing an overview of the objective and tools for reaching the National Recovery and Resilience Plan (NRRP) digital-related objectives.

A particular focus in this second part of the book concerns cloud computing, as different owners for companies' data storage could matter for industrial policy.

The European dependence on foreign actors (the so-called GAFAM - Google, Apple, Facebook, Amazon, Microsoft) could be an issue for companies and for a European industrial policy. Possibilities to overcome this problem may differ, being differently located along the traditional state-vs-market axis. In that respect, Marco Berlinguer (Chapter 8) and Massimo Florio (Chapter 9) suggest a bigger role for the public sector, while Francesco Bonfiglio (Chapter 10) proposes a market solution.

Berlinguer points out the importance of increasing innovation in the governance system for Europe in order to achieve a greater "digital sovereignty" in cloud computing. In his chapter he explains the guiding principles developed by Europe for building sovereign cloud computing systems: interoperability, open source, standardization, modularity. These principles have been adopted in two ways: to regulate digital infrastructure and to promote a new kind of industrial policy. To enhance the prospects of European sovereignty, Berlinguer suggests a «bolder use of this matrix of principles», connected with the development of «a new kind of hybrid forms of agency and governance».

Florio aligns with this approach but proposes a new form of governance: a public and supranational alternative to the oligopoly of the major international companies (the *Tech Giants*). He proposes a European supranational entity, along the lines of the European Space Agency, open to partnerships with existing public and private organizations and equipped with an adequate amount of

resources, amounting to several billion euros in annual funding. Without such a commitment, the prospect of opposing the Tech Giants remains elusive: «What could an entity of this kind do on a large scale? Firstly, it could provide users with the kind of guarantees that Tech Giants do not offer on how to use data; it could implement and manage a European cloud so that data remains in Europe and stays in a public digital space. And it could effectively deal with a series of technological adjustments, both on data transmission networks and computing, which must be seen in an integrated way».

Francesco Bonfiglio, former CEO of Gaia-X, presents a different solution to achieve European cloud sovereignty, based on a bigger role for the market. Bonfiglio describes the project GAIA-X, whose principal aim is to create a European cloud technological stack, thereby reducing the dependence on non-European platforms. Despite facing several obstacles, this project has sparked significant debate. Participants in the project are required to ensure transparency, controllability and interoperability of their digital services. The Gaia-X project is inclusive but discriminates «against those platforms that rely on the opacity of their features and the difficulty of migration, their strong point, creating a client dependence effect (lock-in).» In this way, technologies that would otherwise be ends in themselves, or often demonized because of misunderstanding (such as for Blockchain, which was for years called speculative by misleadingly associating it to the use in cryptocurrencies), finally assume a clear and useful role within a specific purpose: creating a network of services that are more transparent, controllable and interoperable with each other.