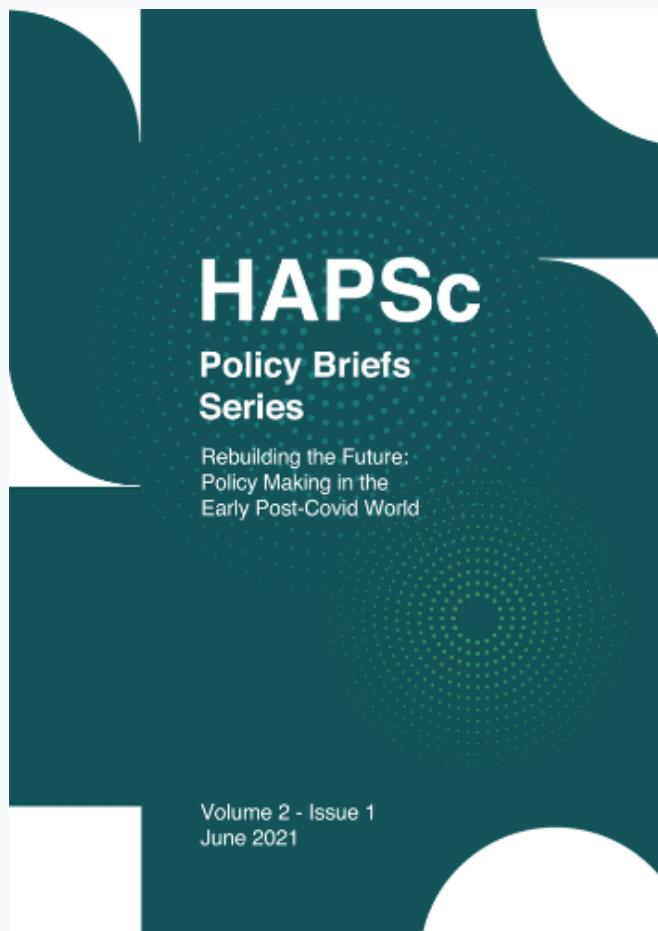


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Chinese Industrial Policy: A Challenge for the European Union amid the Global Pandemic¹

Pavlos Petidis²

Abstract

The COVID-19 pandemic, which triggered lockdowns in Europe and around the world, had a major effect on European Union (EU) industries. Multiple supply chains in a variety of industries were disrupted, especially at the start of the crisis, and particularly in internationalized and complex value chains. Unparalleled policy responses have been undertaken in Europe and the world to mitigate the impact of this economic shock and help recovery. However, the pandemic has also created a wide spectrum of opportunities in many sectors of the global economy, as consumers and businesses have changed radically their behavior. Under this context, superpowers such as the People's Republic of China have taken constructive steps to facilitate the digital transformation of their industry leaving behind United States and the European Union. The purpose of this policy brief is the provision of an overview of China's national strategic plan titled "Made in China 2025" and its fundamental pillars as well as the development of policy recommendations regarding strengthening European Union's industrial policy amid the global pandemic.

Keywords: Industry 4.0; European Union; Made in China 2025; Digitalization; Fourth Industrial Revolution; Covid-19.

Introduction

Since the 2010s, China has risen as an emerging superpower in terms of Purchasing Power Parity (O.E.C.D., 2020). Because of rivalry in the manufacturing sector stemming from both low-wage countries like Vietnam and highly developed countries like the United States, China embarked on a journey to align its economic and technological competitiveness with the economic paradigm of "Industry 4.0" and meet the demands of its increasingly trained workers (Wang & Chen, 2020). In that respect, the global pandemic intensified China's conviction in having a digitized industrial complex that can cope with the economic consequences of an unprecedented crisis. Chinese industries are not only pushing the technological wave in traditional areas such as electronics, machinery and aviation, but they are also driving technological innovations in emerging areas such as advanced nuclear energy, next generation telecommunication technologies, big data and supercomputers, Artificial Intelligence, robotics, and space technology. The European Union has provided explicit policies to curb the gap with the Chinese industry in terms of competitiveness (Zachariadis & Szczepanski, 2019). Member states also support global projects such as Industrie 4.0 in Germany, the

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Factory of the Future in France and Italy, and Catapult centers in the United Kingdom. But an urgent need for a comprehensive industrial strategy has been underlined by policymakers and pressure groups amid the global pandemic. The need for investment, changing business models, data issues, legal issues of liability and intellectual property, and skill mismatches are some of the challenges that must be addressed if the benefits of new manufacturing and industrial technology are to be realized.

The rise of Industry 4.0 and "Made in China 2025"

Industry 4.0 emphasizes the transformation of the production, function, and service of manufacturing systems and goods through the convergence of intelligent digital technology such as machine learning, real-time data, and the Internet with traditional industry. The factory, suppliers, distributors, even the product become digitally linked, resulting in a reconfiguration of the entire value chain process where automation of the manufacturing process, transfer of data, and interconnectivity constitute its central pillars. Industry 4.0 technologies provide companies with better awareness, control, and data visibility across their entire supply chain. In addition, as machine learning algorithms learn to rapidly customize machines to adapt to customer-supplied requirements, companies can gain an advantage over less-efficient rivals by using supply chain management resources to bring goods and services to market quicker, cheaper, and with higher quality.

As part of the Thirteenth Five-Year Plan (F.Y.P.), China devised its national strategic plan titled «Made in China 2025» (M.I.C.), which was portrayed as a roadmap to transition away from being a manufacturer of low-tech products facilitated by lower labor costs to a global powerhouse in high-tech industries (Wang & Chen, 2020). Regarding overall policy direction, M.I.C. and F.Y.P. overlap, with F.Y.P. emphasizing the “crucial significance to the government's leadership in progressing indigenous innovation, achieving technical self-sufficiency, and improving the state's position in the market” (Zachariadis, 2019). M.I.C. also signifies a departure from the smaller-scale 2006 initiative "Strategic Emerging Industries" (S.E.I.), which focused on updating advanced technology to protect the role of strategic emerging industries such as renewables and alternative fuels. It constitutes a state-driven program that includes regulatory oversight of foreign investments in strategic sectors, mergers and joint ventures, access to foreign intellectual property, and agreements between the government and foreign entities. Thus, the scope of M.I.C. is more comprehensive, focusing on the entire manufacturing process rather than just technological advances, supporting conventional industries and services, and incorporating “unique steps for innovation, efficiency, product quality, and green development” (Zachariadis & Szczepanski, 2019).

To reduce China's dependence on foreign technologies, Beijing has enacted a broad spectrum of regulatory reforms. By requiring banks to disclose their source code and use domestic I.P. and encryption, these safe and controllable standards can limit foreign competition and provide access to technology from abroad (Wang & Chen, 2020). Supply-side initiatives are being implemented by the federal and provincial governments to help businesses improve their manufacturing processes. Chinese companies are naturally given preferential treatment when they receive funding from state banks. Subsidies, low-interest loans, and bonds are distributed by state-owned banks, primarily to small and medium-sized businesses. Various organizations and trusts also provide direct financial assistance. The Advanced Manufacturing Fund, for example, has \$3 billion available to update technology in critical sectors, while the National Integrated Circuit Fund has \$21 billion (Wang and Chen, 2020). Importantly, funding is contingent on businesses using indigenous I.P. to replace international I.P.

As per with leading business conglomerates, they have concentrated on future technology. Telecommunications, wireless-sensor networks, 3D printing, industrial e-commerce, cloud computing, and big data seem to have built intellectual property and power. Baidu and other companies have been given permits and licenses to test their self-driving cars. For example, Baidu has unveiled «Project Apollo» a platform that offers hardware and open-source code for other manufacturers to build their vehicles. Also, the government has been making materials more accessible and offering incentives to companies working on electric batteries. To encourage foreign investments and acquisitions, the government has also directed companies to increase their international brand awareness, become more familiar with overseas cultures and markets, and strengthen investment activity risk management. The target of increasing the domestic content of core components and materials to 40% by 2020 and 70% by 2025 would help with self-sufficiency and the ultimate goal of localizing the manufacturing process (O.E.C.D., 2020).

As it dictates policy and incentivizes research and development and industrial modernization, M.I.C. contributes to expanding government power over critical industries. Beijing is altering Chinese companies' established business relationships by promoting acquisition, restructuring, and access to foreign intellectual property. State-owned entities have begun to merge, especially those that overlap with M.I.C. 2025 sectors. This, coupled with large multinationals that are already implementing the government's growth plan, would aid in developing national champions capable of competing more effectively with foreign multinationals. Between 2005 and 2016, Chinese companies spent 13.6 billion dollars in Germany and 135 billion dollars in the United States, gaining access to intellectual property and forming joint ventures with companies that had already achieved the desired automation

and innovation (Institut Jacques Delors, 2019). This, on the other hand, entails direct government financing of private equity, which is then used to promote investments. China's rail industry has already produced exports to Asian neighbors, and the One Belt, One Road initiative will be used to pursue innovation and expansion. Over 100 billion dollars in investments in South America's ten main sectors have resulted in joint ventures and manufacturing and service-based exports for Chinese firms (Institut Jacques Delors, 2019).

European Industrial Policy at the Crossroads: Challenges and Policy Recommendations

In this context, the last decade has seen a rebalancing of the global economy. The Chinese economy's unprecedented size and pace of growth over the last decade has also been reflected in the country's ambition to increase its political power and gain geopolitical control through economic might. Parallel to China's development, the poor financial success of the E.U. and other previously dominant highly industrialized countries has changed the world's economic center of gravity to the east. Most importantly, this change has occurred at an astonishing pace. To retain its international competitiveness against China, the E.U. must continue to concentrate on global supply chains and accelerate national recovery and resilience strategies to avoid further widening the gap with other leading economies.

A comprehensive industrial policy should pay attention to the importance of strategic value chains. The effects of the COVID-19 pandemic on value chains have so far not triggered a change in the functioning of the globalized economy; however, they increased the awareness of vulnerabilities. A high-level and permanent governance should be developed at the E.U. level to track and improve strategic technical areas critical to E.U. industrial competitiveness and build the conditions for the establishment of essential chains of value in Europe (Institut Jacques Delors, 2019). The European Parliament, in particular, should enable the E.U. and the Member States to pool resources and jointly invest in strategic industries. The choice of transferring up to 4% of the R.R.F. to InvestEU could be investigated as a means of mobilizing such capital. Since the window of opportunity for effective technology implementation is usually at the interface of applied science and commercialization, this new governance mechanism should be highly diligent in tracking innovations. By leveraging Europe's recognized industrial strengths in managing cross-disciplinary ventures, as well as Europe's heritage of excellence in scientific research, the E.U. industry will improve its role at the forefront of emerging technologies, such as developing trustworthy Artificial Intelligence, automated mobility and logistics, advanced materials, and biotechnology. Examples such as semiconductors and batteries show how combined efforts can support European value chains (Raza et al., 2021).

An E.U. industrial strategy should ensure appropriate policy responses to equalize the playing field for European companies. Provision of advisory mechanisms for S.M.E.s would enable them to redefine their value chain positioning, absorb advanced technologies, and master innovation management. Within the E.U., investments co-financed by E.U. instruments and programs should be driven by stringent requirements based on E.U. added-value and conditionality aimed at prioritizing investments in the European economy (Institut Jacques Delors, 2019). The E.U. should encourage the export of E.U. goods and innovations by making overseas financing available through the EIB and Export Credit Agencies. Also, the E.U. should collaborate with other O.E.C.D. Members to ensure that the O.E.C.D. export credit rules are well suited to the needs of the E.U.'s export industries (O.E.C.D., 2020). The E.U. must work within the International Working Group on Export Credits (I.W.G.) to reach an ambitious international export credit discipline with non-OECD countries that can promote openness and a level playing field.

The coronavirus pandemic has had a negative impact on corporate R&D decisions. The COVID-19 pandemic has harmed the balance sheet potential for increased investment in many cases, while Europe lags in R&D spending in the vital sector of computer software and hardware development (Raza et al., 2021). National and European R&D public investments, in collaboration with private investments, would help improve the digital economy by assisting the E.U. in leading the technological transition in areas where the E.U. has a competitive advantage, such as highly trained populations, manufacturing industries and advanced equipment, healthcare, and education systems (Raza et al., 2021). In addition, the establishment of A.I. excellence centers across Europe will serve as world-class research hubs, global talent magnets, and local points of contact for the community and stakeholders (Institut Jacques Delors, 2019). Concerning regional initiatives, the added value of regional investment opportunities should be realized by developing an enabling mechanism for inter-regional investment platforms and financial schemes that help promote funding priorities. The Vanguard Initiative, a network of European regions with a high-level political commitment to using intelligent specialization strategies, can work as a roadmap.

In terms of digital and technological re/upskilling, the draft recovery plans of the Member States lack the requisite emphasis on industrial sector modernization and labor-force skill requirements. The Recovery and Resilience Facility's impact risks being reduced due to a lack of attention under a plethora of priorities, especially in creating the right framework conditions for businesses to recover and adjust (O.E.C.D., 2020). Thus, digital re/upskilling steps are a means of increasing the resilience and productivity of E.U. companies. Digital and technological skills in Science, Technology, Engineering, and Mathematics (S.T.E.M.) are also essential in strategic value chains such as artificial

intelligence (A.I.). The E.U. and the Member States already recognized this in initiatives such as the recently started European Software Skills Alliance or the E.U. Digital Skills and Jobs Coalition and its national counterparts.

The federal recovery and resilience plans should aim to boost the competitiveness of the E.U. industry via R&D investments and digital re/upskilling. In addition, regions encourage the use of makerspaces in higher education institutions. Makerspaces enable community members to design, prototype, and produce products with resources that would otherwise be inaccessible or prohibitively expensive, such as 3-D printers, digital fabrication machines, and computer-aided design (CAD) software. Higher education institutions should create makerspaces to assist students in using rapid prototyping equipment, thereby gaining skills for Industry 4.0 and sharing their ventures, which can serve as a jumping-off point for students to launch start-ups, get guidance on how to market a product, and connect with potential lenders.

Finally, the European Union should be prepared to take global action to build the conditions for E.U. industrial leadership to thrive. This involves promoting circular economy approaches and setting an example in renewable, innovative technology, and decarbonization policies to guide the global and domestic implementation of the Paris Agreement (Institut Jacques Delors, 2019). Building on this action plan, the European Raw Materials Alliance has one of its key actions to implement a Circular Economic for complex products like electric vehicles, cleantech, and hydrogen equipment. European industries, especially E.E.I., must address competitiveness issues to address the risk of carbon and investment leakage (as long as the climate policies of other major economies do not match the European efforts).

The E.U. must ensure that policies supporting the transition to a low-carbon economy address entire value chains rather than individual industries and that it strives to create effective price signals through market-based instruments such as carbon pricing and global taxes. Carbon price coherence must resolve both direct and indirect carbon leakage risk in some sectors. This should be viewed in conjunction with the development of a “Carbon Leakage Plan” (O.E.C.D., 2020). Finally, the E.U. must ensure adequate access to alternative energy sources and raw materials at reasonable prices, such as large amounts of renewable energy and fuels, and foster global technological harmonization (e.g., U.N. framework), which is a critical factor in improving the competitiveness of historically highly export-intensive sectors. Mutual understanding of requirements and regulatory collaboration will help to reduce construction costs and prevent administrative redundancy (Directorate-General, 2019).

Conclusions

The European Union is facing the major challenge of creating strong industrial structures that can compete with the rise of Chinese power. Creating a holistic industrial policy based on cutting-edge technologies such as artificial intelligence and the Internet of Things is recognized as the most appropriate tool in the hands of policymakers. The speed with which this policy will be achieved will also determine the EU's position in global competition.

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