İSTANBUL ÜNİVERSİTESİ YAYINEVİ

İstanbul Üniversitesi Sosyoloji Dergisi

*İstanbul Üniversitesi Sosyoloji Dergisi* 40(2): 577–597

**DOI:** https://doi.org/10.26650/SJ.2020.40.2.0058
**https://iupress.istanbul.edu.tr/tr/journal/iusd/home**

**Submitted:** 15 May 2020
**Revision Requested:** 29 July 2020
**Last Revision Received:** 21 October 2020
**Accepted:** 15 November 2020

RESEARCH ARTICLE

# The Renaissance of Industrial Policy: Developmentalism in the Era of Post Globalization

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**Abstract**
Industrial policy lost legitimacy and disappeared in public discourse in the heyday of neoliberalism and Washington consensus. Recently, however, industrial policy is experiencing a renaissance in many parts of the world. There have appeared several forms of industrial policy in the academic literature that vary greatly with different conceptualizations of the state. Even within one type of state there may be multiple types of industrial policy. The discussions on industrial policy in the 1980s-1990s used to be dominated by the conceptualizations of the developmental state that emphasized promoting strategic industries and the social-protection state that focused on protecting sunset industries. Nevertheless, the three ongoing megatrends, the globalization reversal, technological revolution, and the great-power competition in the profound transformation of the postwar international order, plus the unique experience of the Chinese development in the past four decades, have presented us three other types of industrial policy, practiced by the entrepreneurial state, the market-facilitating state, and the competitive-advantage building state. Industrial policy has indeed regained legitimacy, but it still faces many challenges. There will be a process of social construction in the future in which various state and societal actors redefine the scope and acceptable means of industrial policy.
**Keywords:** Industrial policy • The developmental state • The social-protection state • The entrepreneurial state • The market-facilitating state • The competitive-advantage building state

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**To cite this article:** Gao, B. (2020). The renaissance of industrial policy: Developmentalism in the era of post globalization. *İstanbul Üniversitesi Sosyoloji Dergisi, 40,* 577–597. https://doi.org/10.26650/SJ.2020.40.2.0058

Since the summer of 2016, economists in China have been debating industrial policy with great enthusiasm. The Chinese media has hyperbolically called it "the debate of the century." The pro side of the industrial policy argument draws support from studies on several countries' historical experience: the Netherlands in the 16th-17th century; the United States, Germany and France in the 19th century; and Japan and the "Four Asian Tigers" following World War II. Every country or region that successfully became an advanced industrialized economy did so through their reliance on a national industrial policy, without exception. Furthermore, in the post war era, all thirteen of the economies that have grown 7% annually for 25 years have five characteristics in common, two of which are a capable government and an effective market (Lin & Zhang, 2016).

In contrast, the con side of the argument holds that the current Chinese industrial policy has led to imbalanced development and overbuilt production capacity. It argues that any industrial policy is nothing more than a planned economy wearing a mask. According to this view, innovation is unpredictable and full of uncertainties and, inasmuch as bureaucrats lack entrepreneurs' sensibilities and judgement, it is unwise to place the nation's limited resources in their hands. In addition, bureaucrats often fall into the trap of corruption, using their powers for rent-seeking whenever they make decisions on taxation, subsidies, finance, land use, and import/export certificates (Lin & Zhang, 2016). Some economists also contend that state intervention in the market often leads to unfair competition as industrial policy supports some companies while suppressing others; the state often favors state-owned enterprises but discriminates against private companies and its favorable treatment of local companies creates market barriers that lead to the fragmentation of the national market (Hou & Bi, 2016).

In the international arena, there is an equal amount of excitement on the subject of national industrial policy. According to the United Nations Conference on Trade and Development, in the past five years at least 84 countries - including both developed and developing countries – that account for 90% of the world's GDP have adopted formal industrial policies. "In the decade since the global financial crisis, the number of countries adopting national industrial development strategies has increased dramatically. The rate of adoption of both formal industrial policies and industrial policy measures targeted at industrial sectors appears to be at an all-time high" (UNCTAD, 2018, p. 128). Today, the US-China trade war and the COVID-19 pandemic have bestowed industrial policy with even more significance. As the US former Secretary of State Hilary Clinton asserted in her latest Foreign Affairs article, "It is time for ambitious industrial policy" (Clinton, 2020, p. 96). According to Germany's *Industrial Strategy* 2030 adopted in 2919, "industrial policy strategies are experiencing a renaissance in many parts of the world. Hardly a successful country exits that relies exclusively and without exception on market forces to manage the tasks at hand" (Federal Ministry for Economic Affairs and Energy, 2019, p. 8).

Industrial policy is a hallmark of the developmental state. Industrial policy occupied the headlines in the 1980s when the concept of "the developmental state" first came to the public's attention during the US-Japan trade war (Johnson, 1982). After the Asian financial crisis in 1997-1998, it basically disappeared from public discourse amid the triumph of neo-liberalism, the Washington consensus, and the peak of the globalization upturn. However, the subject of national industrial policy began to reemerge in the aftermath of the 2008 global financial crisis, and has become a new catchphrase in the past several years.

What is industrial policy and why has it become an epochal trend in the world? In this article, I first review some classical theories about industrial policy. Then I discuss how several ongoing megatrends, including globalization reversal, the technological revolution, and the transformation of the international order, have brought about an industrial policy renaissance. Next, I briefly analyze how industrial policy has changed in China in the past four decades and explore the kinds of challenges it faces today. To conclude, I discuss the issues that lay ahead for industrial policy in the future.

## Classical Models of Industrial Policy

Forms of industrial policy vary greatly with different conceptualizations of the state. Even within one type of state there may be multiple types of industrial policy. For these reasons, it is more practical to identify the types of industrial policy themselves.

*The developmental state* invented classical industrial policy and that policy was practiced in Japan in the 1930s-1970s and South Korea in the 1960s-1980s. The concept of the developmental state was first presented by political scientist Chalmers Johnson (1982) in his seminal work on Japan's Ministry of International Trade and Industry (MITI). According to the logic of the developmental state, in a country like Japan that is poorly endowed with national resources, the country's economic survival relies heavily upon international trade. In order to obtain more benefits through international trade, the state needs to focus its policies toward high value-added industries and promote exports aggressively. In order to nurture domestic companies' industrial competitiveness, the state needs to set trade barriers, both in tariff and non-tariff forms, to protect its domestic markets while simultaneously allocating the country's limited resources to support the development of these infant industries (Gao, 1997; Johnson, 1982). A fundamental difference between the Japanese economy and the orthodox market economy represented by the United States lies in their ideologies: whereas mainstream Western economics focus on the equilibrium of the market, developmentalism is driven by nationalism with a clear goal of industrialization (Gao, 1997; Murakami, 1996).

The developmental state, in Johnson's original conceptualization, stands in contrast to the regulatory state represented by the United States. The crucial difference between the

two is that the latter is unconcerned with economic structure, instead allowing the market to decide which industries prosper and which decline. The former, in contrast, cares greatly about economic structure, and takes great pains to ensure the development of strategic industries (Johnson, 1982). The conception of the Japanese developmental state as a model of governmental intervention similar to a planned economy is a misinterpretation of the arrangement. Rather, the Japanese developmental state strongly encourages oligopolistic competition. Its rationale is that too many players within the same industry would result in "excessive competition" thereby squandering limited resources and preventing domestic companies from growing into big players. Japan recognized that without competition, domestic companies would never become competitive in the international market. In practice, the Japanese state never controlled all industries and instead focused its attentions on only the most strategic ones (Gao, 1997, 2001).

This new conceptualization of the developmental state was significant in the field of comparative political economy because, for the first time, academic literature described two analytical categories of states within the capitalist bloc during the Cold War. Later writings in the varieties of capitalism literature further pushed this new analytical depth, identifying cross-national variations in market economies by presenting a dichotomy of the liberal market economy and the coordinated market economy (Hall & Soskice, 2001). The Japanese developmental state – or at least, the Japanese version of developmentalism – apparently belongs to the latter category.

In *the social-protection state*, political stability is the state's major policy objective. In contrast to the developmental state, whose goal is to actively promote sunrise industries that have high potential for value-added benefits in international trade, the type of industrial policy practiced by the social-protection state is carried out in sunset industries where domestic companies have lost their comparative advantage. A major characteristic of this type of industrial policy is its restrictions on competition. Many countries practice this type of industrial policy because, by controlling competition, states can prevent massive layoffs during an economic downturn and reduce the state's social protection burden. The state in both Japan and European countries exerted various industry-based anti-competition regulations to protect jobs and slow down the decline of sunset industries. Some countries even allowed small and medium-size companies to organize cartels during recessions (Gao, 2001; Tilton 1996). In China after the reform began in the late 1970s, in an effort to undertake a new pattern of industrial governance, the state often practiced anti-competition policy, constraining market entry and exercising frequent administrative interventions (Wu & Chen, 2016).

A distinguishing feature of the social-protection state is its recognition of the state's dual role in promoting the development of emergent strategic industries as well as governing declining industries – a role that no state can escape. For this reason, social-protection itself

is an important dimension of any state's industrial policy and the social-protection state often coexists with the developmental state as two sides of the same coin. In the Japanese case, growth and stability were a dual focus of Japanese industrial policy (Gao, 1997, 2001). For this reason, the World Bank pointed out in a 1993 report that the East Asian model of development emphasizes egalitarianism and, comparatively speaking, has reduced income inequality (World Bank, 1993). Because the protection of sunset industries is driven by domestic politics, some analysts argue that Japan's domestic politics are not much different from those of Western countries (Calder, 1988; Uriu, 1996).

## Globalization Reversal and the Return of Industrial Policy

After more than one decade of virtual absence from public discourse, industrial policy reemerged against a backdrop of globalization reversal in the aftermath of the 2008 global financial crisis.

The long-term movement of capitalist economies is driven by a pendulum movement of globalization between two distinctive paradigms of public policy: releasing market forces versus protecting society (Gao, 2001; Polanyi, 1958 [1944]). After nearly three decades, the 2008 global financial crisis was the turning point at which public policies in many countries began to swing from the paradigm dominated by neoliberalism to a focus on social protection. This new sentiment has led to the British exit from the European Union, Trump's election to the U.S. presidency in 2016, and a wave of anti-free trade and anti-immigration movements around the globe.

From a historical perspective, this turn of globalization reversal since the 2008 global financial crisis mirrors the turbulent era of the Great Depression and World War II in the previous century. It is not a coincidence that classical industrial policy in Japan emerged back then heated discussions about industrial policy occur today. There were two distinctive features in the original characterization of Japanese industrial policy: one was its anti-competition measures that replaced private cartels with compulsory trade associations with an aim to mitigate damage and disruption to market forces in the aftermath of the Great Depression; the other was the enactment of various legislations to mobilize national resources for the state's prioritized goals, exemplified by the National General Mobilization Law of 1937 that aimed to help the country survive in World War II (Gao, 1997, 2001, 2004; Johnson, 1982).

Both of these features – anti-competition and resource mobilization measures – are, with some modifications, easily recognizable in the ongoing public discourse on industrial policy over the past ten years. The non-coincidence of the spotlight being placed on industrial policy in the 1930s and now in the past decade is due to the episodic conditions under which industrial policy enters the stage of globalization.

Between the early 1980s and the eve of the 2008 global financial crisis, the ideology of neoliberalism dominated the public policy paradigms of many countries. Marketization, privatization and deregulation were major trends in reforms meant to get rid of the inefficiency that occurred as a result of the social protection policy paradigm that had been in place since the Great Depression. The state loosened its regulatory control and abolished various trade barriers while multinational corporations in developed countries pushed development of the global production system which in turn was sustained by an increase of the size and scope of foreign direct investments, offshore production, and outsourcing. This resulted in an impressive expansion of trade and economic growth (Gao, 2018). After the Cold War ended in the early 1990s, an illusion of "the end of history" swept public discourse in Western countries (Fukuyama, 1989). Since liberal democracy and the market economy were perceived as the ultimate evolution of political and economic institutions in human society, both the need for industrial policy and the need for the developmental state were deemed obsolete and disappeared from public attention (Gao, 2020).

The 2008 global financial crisis brought a legitimacy crisis for orthodox policy instruments, both fiscal and monetary, that had developed during the heyday of neoliberalism in the previous three decades, because they no longer seemed to work to induce economic recovery. There had now been 4 million job losses in Europe since 2008. By 2013, however, only 1.6 million jobs had come back, in spite of the fact thtat various stimulus policies had been adopted. The failure to explain this circumstance pushed Europeans to rediscover the field of industrial policy. In Britain, the economic rebalance program shifted toward sustainable production and away from mechanisms that promoted economic growth by overly relying on consumption and finance. Economic commentators and policymakers began to argue that the state *should* play an important role in the economy by means of industrial policy. This was evidence that they had begun to question the orthodox neoliberalism that had occupied British consciousness since the late 1970s (Bailey et al., 2015, p.1). In Germany, a new understanding of industrial policy meant it would work to become a powerhouse in international competition. After the EU commission rejected the proposed merger between Siemens and Alston, the Economic Minister demanded that the EU amend its competition laws and allow European countries to each build their own national champion companies (Reuters, 2019). France was once a major European country that practiced industrial policy. After the global financial crisis, the French no longer saw globalization as an opportunity, but rather a threat from which people would need government protection. Many called the state to make industrial policy around innovations (Aiginger, 2011). Italy lost one fourth of its GDP in the global financial crisis, and its per-capita income fell below the EU average. Many Italians argued that the EU's industrial policy should give priority to Eastern and Southern Europe and promote industrial development by providing subsidies, finance, and support to R&D (Lucchese et al., 2016).

Strong demand for social protection emerged from the severe damage caused by the rise of global production system especially in North America. Between 1977 and 1999, three million jobs were lost in the US manufacturing industry. At the same time, however, multinational corporations created jobs overseas. Generally speaking, for each 10% capital increase in a multinational company's overseas branch, there was a corresponding 0.1%-1.8% loss of jobs in the United States. When investment in overseas by multinational corporation doubled, it resulted in an 18% loss in jobs in the American manufacturing industry (Harrison & McMilan, 2006). Moreover, due to offshore production and outsourcing, the recovery of employment after a recession took a much longer time. In the 1991-1993 recession, it took only two quarters for industrial output to return to pre-recession levels, but it took 23 months for job numbers to come back. In the 2001 recession, it took only one quarter to see the recovery of industrial output, but it took 38 months for job numbers to come back. Between 2006-2007 the unemployment rate in the United States was 4.6%. After the downturn created by the 2008 global financial crisis, it took less than two years to see economic growth again, but by May 2016, almost *eight years* later, the unemployment rate had come down to only 4.7% (Rajan, 2010). These events significantly contributed to the emergence of strong anti-free trade and anti-immigration sentiments.

A main theme of social protection is the rejection of the market principle in order to prevent the negative impacts of competition on employment and political stability. Even at this moment with the forthcoming presidency of Joe Biden, policy measures against competition remain within the range of possibility. One distinctive strategy is to protect domestic employment by reducing pressure from international competition. A major platform adopted by President Trump was to bring the manufacturing industry back to the United States. President-elect, Joe Biden asserts a trade policy that fits the interests of middle-class families. He further points out that he will not sign any new free trade agreement until the US government makes major investments to upgrade the county's infrastructure and enhance American companies' and employees' international competitiveness (Hirsch, 2020). The purpose of the anti-free trade and anti-immigration movements is to reduce foreign competition, in terms of job opportunities at both the individual and company levels.

The industrial policy practiced by the social protection state emerged in many countries that aimed to prevent the loss of domestic jobs. In the United States, President Trump adopted a taxation policy to encourage multinational corporations to bring overseas jobs back to the US. At the same time, his policies restrained the inflow of foreign capital with an aim to reduce international competition, a strategy that used to be a basic element of the industrial policies of Japan, South Korea, and many other countries. By 2018, restraining policies accounted for 34% of all foreign investment policies in the world, the highest proportion since 2003. Even when the state adopted

a stimulus plan, it often came with a condition that any purchases must give priority to domestic goods. In addition, multinational corporations in developed countries have considerably slowed down their participation in global value chain production. Between 2000 and 2010, the average annual growth rate for global value-chain production among the European Union, the United States, and Japan were 12%, 7% and 9%, respectively. In contrast, in the following period, 2011-2017, the growth rate declined to merely 1% for both the European Union and the United States, and Japan did not have any increase at all (UNCTAD, 2019).

**The Technological Revolution and the Role of the State**

Another driving force behind the heated discussion on industrial policy is the ongoing technological revolution in which "advanced capitalism came to be centered upon extracting and using a particular kind of raw material: data" (Srnicek, 2017, p. 39). In this new era, "just like oil, data are a material to be extracted, refined, and used in a variety of ways. The more data one has, the more uses one can make of them" (Srnicek, 2017, p. 40).

This has direct implications to manufacturing industry. Smart manufacturing pushes human beings toward a seamless interface between the digital world and reality. Factories in the future will become completely automated, digital, networked, and intelligent. They will become more flexible and satisfy the demands of the market through improved design, production, and logistics. Their consumption of raw materials and energy will be sustainable, rational and increasingly humanistic. People will continue to occupy the center of activity and play important roles; technology will support employees rather than replace them and computer intelligence will augment human intelligence (Yanez, 2019). Not since the steam engine has society seen a technology with the potential to forever change not only transportation, but international trade and society itself. Over the past three decades, the internet has become an indispensable core technology that will profoundly change the course of history. It encourages fair competition, enables any company to develop into a brand with a global presence, connects producers, suppliers and consumers, and provides huge amounts of data for decision making. The internet has made the world more digital and, consequently, triggered the rise of the digital economy (Jutras, 2019).

If the 2008 global financial crisis and the trend of globalization reversal brought our attention back to industrial policy because of its original features of anti-competition for protecting employment and controlling the distribution of credit and materials to ensure production, the technological revolution, especially the rise of the digital economy in the past three decades, has become a major driving force behind the conceptualization of a new type of industrial policy.

*The entrepreneurial state* is conceptualized according to the practices of the US federal government, especially the Defense Advanced Research Projects Agency (DARPA), a part of the US Department of Defense. This new version of industrial policy promotes R&D in the frontiers of the technological revolution (Mazzucato, 2015). It aims to spur innovation by reducing the enormous risks associated with investment in R&D of radical frontier technologies. Contrary to the conventional image of the United States in which private companies play the leading role in technological innovation, the U.S. federal government "has provided early-stage finance where venture capital ran away, while also commissioning high-level innovative private sector activity that would not have happened without public policy goals backing a strategy and vision" (Mazzucato, 2015, p. 79). Common practices to encourage innovation include government subsidies and government procurements. Generally speaking, this type of industrial policy targets only frontier technologies. The state is not normally involved in the commercialization of these technologies.

The conceptualization of the entrepreneurial state in the United States by a British scholar is significant because for a long time American academia did not acknowledge the existence of a US government industrial policy. Rather, the US government was seen as representative of the liberal market economy. But by identifying the US federal government as an entrepreneurial state in regard to its policies toward frontier technologies, especially those related to defense whose spillover affects other sectors of the American economy, we deepen our understanding of American industrial policy. Even more importantly, this understanding highlights the role of the state in reducing and bearing the burden of risks associated with innovation in radical technologies and technological development in general. The state's role in mitigating these risks for companies is more important than ever, especially in the modern technological revolution brought about by the digital economy.

Developed countries, under the pressure of competing with a rising China, have all rushed to implement various industrial policies that promote the internet of things, big data, clouding computing, and artificial intelligence. Germany adopted its famous "Industry 4.0," plan which focuses on "the smart factory", "smart production", and "smart logistics". It optimizes the industrial process of basic production engineering and transforms the manufacturing industry from the bottom up. The Ministry of the Economy and Energy invested in centers that promote the digital capacity of small and medium-size companies (TWCSI, 2020). The United States adopted the "Strategy for American Leadership in Advanced Manufacturing," emphasizing the R&D of new manufacturing technologies. Its "Future Industrial Development Plan" aims to provide government support for the advanced manufacturing industry, artificial intelligence, quantum computing, and 5G cellular technology. The National Science Foundation has supported research in cyber-physical systems for 14 consecutive years. Big

corporations leading development is a characteristic of the US strategy and the country's Industrial Internet Consortium has continuously recruited leading companies such as GE and Cisco in each technology sector. The White House held two summits to promote the development of artificial intelligence to organize support for the national AI R&D ecosystem, the development of the tech workforce, the removal of barriers to AI innovation, and enabling high-impact, sector-specific applications of AI (The National Science & Technology Council, 2018).

At the same time, the technological revolution presents several challenges to the state. On one hand, states can best support development through industrial policy. On the other hand, development-focused industrial policy often prompts calls from various domestic groups for social protection policy. This dilemma has three dimensions: First, an increase in industrial efficiency presents big challenges to inclusive development. While information and production technology can improve productivity, return on capital, lower transaction costs, and eliminate the information gap, the accompanying artificial intelligence, robotics, and automation can lead to the failure of a development strategy that aims to create job opportunities. Second, the winner-take-all phenomenon that has accompanied the development of information technology indicates that the benefits of technological development may concentrate among a small number of countries or societal groups. The state needs to adopt active industrial policy to maximize the contributions of the digital economy toward economic diversity and structural transformation. Third, the development of a digital economy tends to make the strong stronger and the weak weaker. In order to protect the interests of developing countries, the state needs to strengthen antitrust law and competition policy, and explore new policies in regard to government procurements, public participation in long-term investment, the localization of data storage, and industrial standards (UNCTAD, 2018).

**The Transformation of the International Order**

The importance of technology for great-powers competition burst onto the scene of history rather suddenly. Back in the 19th century, the "key drivers of [history] were the steam engine, germ theory, electricity, and railroads... Nobody knew it in 1800, but the geopolitical future of the nineteenth century had already been set in motion nine decades earlier, when Thomas Newcomen invented the first practical steam engine. Historians and foreign policy experts may not like to hear it, but all the things they teach and write about the geopolitics of the nineteenth century are mere footnotes to the industrial revolution" (Brum, 2018, p.44). Perceived from this perspective, without the industrial revolution, there would no rising middle class demanding democracy and there would be no capitalist revolution as agrarian states simply wouldn't need one. There would be no massive colonization because non-industrial economies do not require large volumes of raw materials. Total war would likely not have occurred

because there would not have been cheap steel or the precision manufacturing needed for making modern weapons. Because the world would still have been stuck with agriculture, slavery might still exist and feminism would not have come into being (Brum, 2018).

Recall the period in which Japanese industrial policy formed: it was created to address the failure of the contemporary market and, more importantly, to mobilize national resources in the name of international competition. In a similar way, the renewed attention toward industrial policy in the United States is partially driven by high-stakes competition with China. In 2015, the Chinese government's publication of *Made in China 2025* created a big stir in America. The article has been widely studied in the United States and is perceived to be a blueprint of China's grand strategy for international competition in the 21st century. For the first time in the country's history, US policymakers formally acknowledge the importance of industrial policy. On top of this, the pressure from Chinese competition in technological frontiers, exemplified by *Made in China 2025*, caused a profound change in the public discourse around industrial policy such that the Americans came to see industrial policy in both a historical context which shed light on their own industrial ascendancy in the 19th century and in an anticipatory context that highlights the forthcoming challenges posed by China to the US hegemony in the next three decades.

Until recently, industrial policy had been affected by the "end of history" mentality of the post-Cold War era and so had disappeared from the public's consciousness. According to the dominant neo-liberal ideology of that time, the appropriate role of the state was to take a neutral position and allow the outcomes of industrial development to be determined by the market. But by the end of the second decade of the 21st century, a new conception about the state's role in the economy appeared, especially in the US. The US Senate Committee on Small Business and Entrepreneurship opened its report on *Made in China 2025* with the statement, "in a world of state competition for valuable industries, a domestic policy of neutrality among activities is itself a selection of priority. 'Not choosing' is a choice, however it is made. The relevant policy consideration, then, is not whether states should organize their economies, but how they should be organized. Total neutrality among interacting economic system is impossible, but relative material decline is not… The U.S. cannot escape or avoid decisions about industrial policy" (US Senate Committee on SB&E, 2019, p.11).

The most serious areas of competition between the United States and China, according to US policymakers, lie in technological frontiers. Although there has been a major shift in the balance of power between the two countries since China joint WTO – as measured by total trade, goods exports, purchasing power, and consecutive years of high growth – the US has never truly felt strong competition pressures from China

until the publication of *Made in China 2025* five years ago. In this document, China listed ten frontier technologies that are its targets. As one commentator pointed out, "today's technology is to true AI as the Wright Flyer is to the space shuttle. For the next couple of decades, the most important global movements will be all the usual suspects. But after that, AI is going to start making them seem trivial. Great-power competition will basically be a competition between different countries' AI technology" (Brum, 2018).

*Made in China 2025* signaled that the Chinese government is doing more than merely "breaking the rules" – it is seeking to set new terms for international competition. US policymakers see this as part of China's grand strategy for global dominance. China's plan stimulated the US to create countermeasures. By assessing the goals outlined in *Made in China 2025* and China's progress toward those goals, the US will identify areas that need defensive action. The US also plans to evaluate China's success in those areas and compare them to any corresponding US decline (US Senate Committee on SM&E, 2019). Looking forward, if China does, in fact, meet its goals as outlined in *Made in China 2025*, then the US could experience decline in specific industries just as it did at the beginning of this century. The same contraction that occurred in the electronics, furniture, plastics, metals, and vehicle parts industries may happen tomorrow in the machinery, new-energy automobile, high-end computer, rail, and aerospace industries (US Senate Committee on SM&E, 2019).

In its report to the US Congress on *Made in China 2025*, the Small Business and Innovation Committee suggested an industrial policy aimed at countering China's efforts. The recommended policy involved export controls on national security-sensitive technology and on intellectual property related to the supply of the finished goods discussed in *Made in China 2025*; a prohibition on majority-stake acquisitions of American companies by investors from China, specifically in the supply industries described in *Made in China 2025*; and the establishment of countervailable subsidies and the filing of declaration suits to protect and prevent injury to established industries in the sectors listed in *Made in China 2025* (US Senate Committee on SM&E, 2019).

Industrial policy was born nearly a century ago and governments adopted it under specific historical conditions. We see that the first industrial policy, represented by Japan, emerged in the crises of the Great Depression and World War II and had two major goals: save the economy from market failure and mobilize national resources to fight the war. State intercession in industrial planning was necessary for the country's survival. The intellectual origin of Japanese industrial policy can be traced back to the German theory of total war in World War I. Drawing upon the German practice of mobilizing all industries for fighting the war, Japan did the same in preparation for the coming conflict with United States. The purpose of industrial policy is the mobilization

of limited national resources toward a strategic goal (Gao, 1997). Today, in this era of great-power competition, industrial policy has become indispensable.

## Chinese Industrial Policy in Transition

A discussion of Chinese industrial policy over the past four decades requires some qualifications first.

China started its transition from a planned economy to a market economy in the early 1980s, but it was not until the beginning of the 21st century that it developed its first classical industrial policy, similar to that practiced by the developmental state in Japan. This is not to say that the Chinese government did not have industry-focused policy. In fact, two types of policies existed. One was aimed at industry-based regulations and practiced mainly in the inland regions where industries were dominated by state-owned enterprises. The other was more akin to a pro-growth policy, first practiced primarily in the special economic zones (SEZ) in the coastal areas, and later extended to various industrial parks or high-tech parks throughout the country (Zhao, in press).

The features of regulations in traditional industries are essentially a legacy of the planned economy. They function more like tools for the state to maintain control in these industries. Regulations are often anti-competition and favor SOEs over private companies. In some sectors, new players face high barriers to market entry and SOEs hold a monopoly (Hou & Bi, 2016). Policies of this kind have been seriously criticized both in China and aboard. From the state's perspective, the goal of this type of industrial policy is to maintain political stability by protecting SOEs. This is possible because SOEs employ an enormous number of people. As was the case in the industrial policy concerning sunset industries practiced in Japan and elsewhere, this type of policy is characterized by a strong inclination toward anti-competition. Although reforms led to an abundance of small and medium-size SOEs – as well as creating massive unemployment – in the second half of the 1990s, the state has continued to protect big SOEs in the infrastructure, utilities, telecommunication, and transportation industries.

The industrial policy practiced by local governments in SEZs along coastal areas, however, belongs to a different category.

*The market-facilitating state* conceptualized by new structural economics (NSE) adopted some policies that are often called industrial policy but they are very different. The main goal of the market-facilitating state is to attract inflows of foreign direct investments and promote economic growth by participating in the international division of labor represented by the global production system. Drawing upon the Chinese experience of relying on cheap labor in the SEZs, new structural economics considers

factor endowment the most important criterion by which an economic entity chooses its path for economic development. It maintains that an entity can enjoy comparative advantage in international trade only when it chooses to develop those industries deemed most viable based on its factor endowments in a given developmental stage, often measured by its capital-labor ratio. According to this reasoning, whether or not factor endowments can become comparative advantage is affected by the presence or lack of infrastructure and high or low transaction costs; infrastructure and transaction costs are the primary barriers that prevent an economic entity from transforming its factor endowments into comparative advantage. In other words, comparative advantage will never materialize if one simply waits for market forces to work. So, the state must step in and concentrate its limited resources to actively remove these barriers. "A capable state is the precondition for an effective market, while building an effective market is all that a capable state should do" (Lin, 2014).

The policy practiced by the market-facilitating state does not really fit the strict definition of industrial policy because it did not target any specific industry. Instead, it encouraged the development of *any* industry, so long as it was capable of bringing in foreign direct investment (FDI) and promoting exports, thereby stimulating domestic economic growth. For this reason, we may consider market-facilitating state policy as a horizontal pro-growth policy, rather than industrial policy *per se* because it is not driven by technological concerns, but by a motivation to promote economic growth in general in the most efficient way (Gao & Ru, in press). Moreover, the policy adopted by the market-facilitating state toward economic growth reflects the temporal conditions of industrial policy under neoliberal conditions: for one thing, much of its policy tools are more suitable for an opened market economy and for another, the state does not simply wait for the market to provide dynamics for economic growth, but actively promotes the conditions for growth to happen.

In 2004, China entered a new stage of development that necessitated new policies toward industry. The year was a watershed in the history of Chinese industrial policy; it witnessed the Chinese model of economic development transform from export driven to innovation driven. The primary catalyst for this profound change was international pressure that led to the appreciation of Renminbi and the resulting increase of labor cost in China. After China joined the WTO, exports jumped quickly. Since the summer of 2003, under pressure from Western countries led by the United States and Japan, the value of Chinese currency began to appreciate. As China could no longer rely upon its cheap labor, the state pivoted to promoting industrial upgrades. In 2004, the automobile, air craft, and high-speed rail industries attracted public attention so from that year on, the Chinese government began to promote these specific industries. The moment that China started concentrating its efforts within certain industries instead of relying on cheap labor in order to be internationally competitive was the moment that it took on a classical industrial policy.

*The competitive advantage-building state* emerged at the time to replace the market-facilitating state once the Chinese economy had begun to promote industrial upgrading and innovation. From then on, the state shifted its focus from comparative advantage to competitive advantage. The features of competitive advantage can be illustrated by a hexagon diagram, the components of which include: strengthening factor supply by upgrading the qualities and increasing the types of factor endowments; building infrastructure in order to reduce the cost of business operations; improving institutional environments to reduce companies' transaction costs; expanding market size in an effort to create an economy of scale; developing industrial clusters for deepening the division of labor and advancing specialization; and encouraging sector competition with an aim to promote productivity and innovation. The state treats the development of these six areas of competitive advantage as the main goal of its industrial policy (Gao & Zhu, 2020).

The competitive advantage-building state evolved out of the market-facilitating state, inheriting the latter's focus on building infrastructure and reducing transaction cost but to an increasingly sophisticated extent so as to match the requirements of high-tech industries. At the same time, the competitive-advantage-building state adopts the most important features of the classical version of industrial policy, targeting certain frontier industries that represent the future of technological progress in the global economy, and the typical practices by the entrepreneurial state in reducing the risks of R&D in the frontier technologies. By 2015, when the Chinese government published *Made in China 2025*, the country's accumulations of capital and technology had reached such a level that decisions about industrial targeting were not so much based on factor endowment, but on what industries the country needed to build future international competitiveness. In this sense, a major difference between the market-facilitating state and its successor the competitive-advantage-building is that the latter no longer considers factor endowment to be a major criterion for targeting industries. Comparatively speaking, the market-facilitating state is a theory about how to select an industry to develop, while the competitive-advantage-building state is a theory about how to develop a given specific industry. Part of the reason for this shift is that there is a general international consensus concerning the future direction of the technological revolution, inasmuch as every major economy has recognized the importance of artificial intelligence, the internet of things, big data, and cloud computing. Under these circumstances, it is pointless for China to grapple with capital/labor ratio politics at the national level.

On the surface, the hexagon diagram of competitive advantage looks like Michael Porter's diamond diagram of competitive advantage with the simple addition of building infrastructure and reducing transaction costs; two components advocated by NSE. However, our hexagon diagram of the competitive-advantage-building state has redefined

the conceptualizations of comparative/competitive advantage by both NSE and Porter in two important ways. To illustrate these differences, let's bring in Porter's distinction between basic factors and advanced factors; the former referring to the idea of natural endowments emphasized by classical trade theory and the latter referring to those factors acquired through human effort. First, NSE holds that an economic entity should choose to develop only those industries that are well-suited to what Porter calls "basic factor" as measured by the capital-labor ratio. In contrast, we focus on what Porter calls "advanced factors" with significantly more emphasis on the importance of human agency in creating and enhancing factor supplies. Second, we bring the state back into the discussion of the model of competitive advantage by proposing a causal relationship between state industrial policy and competitive advantage. Although Porter acknowledges that the state is relevant to each edge of his diamond diagram of competitive advantage, he fails to connect them with the state in his conceptualization. In contrast, we highlight the impacts of state industrial policy on the hexagon diagram of competitive advantage and treat the state's industrial policy as the determining factor that shapes the development of competitive advantage (Gao & Ru, in press).

The competitive-advantage-building state is not a unified national model. Even among local governments in China there is a large range of variations in practice. However, the common features we discuss above are distinctively observable in the most competitive industries of the Chinese economy, as well as in most dynamic cities in the country. Instead of leaving the fate of the digital economy to market forces, the competitive-advantage-building state actively intervenes. Nevertheless, it does not simply pick the winners, as some critics have argued, nor does it let the state itself replace private companies. Rather, as its label suggests, the competitive-advantage-building state considers its mission to be the creation of a favorable environment at the macro and meso levels in which companies grow competitive via their own entrepreneurship and market strategies (Gao & Ru, in press).

The US-China trade war in the past three years has prompted China to consider another type of industrial policy. With China's ascendance on the world stage, China is contemplating an international version of the social protection state, one that manages its trade relations with the rest of the world – especially those in developed countries. This kind of industrial policy has never been practiced before but there is a demand for it for two reasons: the size and potential of the Chinese economy and the contemporary reversal of globalization sentiments alongside the trade war and pandemic.

China is confronted with a dilemma between deep integration and development, both of which raise contentions in international trade. On one hand, China is still a developing country when measured by the fact that 600 million Chinese still have a monthly income of merely $150, and development remains a top policy priority in the country. To sustain

its economic development and protect its infant industries over the past four decades, China has placed many stipulations upon other developed countries in the form of trade policies. These include local content requirements for foreign investors, requesting or requiring foreign investors to form joint ventures with local companies and transfer related production technologies, prohibiting or regulating activities of foreign investment within certain industrial sectors, maintenance of SOEs, preferential treatment of national firms during government procurement, and import substitution (Manger & Shadlen, 2019[2015], p. 478). On the other hand, China has become the second largest economy in the world and is set to become the largest in the foreseeable future. Western countries argue to the WTO that China should be treated as a developed country and that it should step forward toward deep integration, a process that "erodes differences in national economic policies and regulations and renders them more compatible for economic exchange" (Kim, 2019[2015], p. 361, and that offers "protection of foreign firms and their interests; liberalization of 'beyond-the-border' barriers to trade (i.e., domestic trade related laws and regulations that go beyond traditional 'barriers-at-the-border' such as tariffs and quotas); and harmonization of domestic trade rules to enhance the efficiency of international production" (Kim, 2019[2015], p. 360).

The future of the international order of trade and the very fate of globalization depend on whether or not China will be able to meet this challenge. For most of the period before the 1990s, the rules of the General Agreement on Tariffs and Trade mainly targeted developed countries while developing countries were largely treated as passive beneficiaries. After the Cold War ended, however, the international trade order transitioned from the GATT to the WTO, increasing its coverage from 58% to more than 80% of the countries in the world. This increased the burden on developed countries to support developing countries which resulted in developed countries requesting more concessions from developing countries. Moreover, within a very short time, some developing countries such as China and India made significant developmental progress and have become too large to be merely passive beneficiaries within the international trade order.

## Concluding Remarks

The return of industrial policy to the public arena driven by three megatrends: globalization reversal, the technological revolution, and the transformation of the international order. An understanding of industrial policy's role has greatly deepened our understanding of these trends and the multiple dimensions of industrial policy itself. We see that industrial policy has adapted to suit the contemporary environment by analyzing it from a historical perspective.

Our current understanding of industrial policy focuses on how it has been impacted by globalization's temporal conditions and the implications this has for modern

industrial policy. Industrial policy's original incarnation – what we here call "classical industrial policy" as practiced by the developmental state in Japan – emerged during a major crisis generated by a downturn in globalization and that was characterized by two important features: a focus on anti-competition measures to protect industries from destructive market forces in the aftermath of the Great Depression, and various policy tools aimed at mobilizing national resources to achieve the state's objectives. Each of these two features is associated with a distinctive type of state: the social-protection state (the former) and the developmental state (the latter). These types of policies are again in great demand today as the pendulum movement of globalization has swung back toward the position it was in the 1930s. The 2008 global finance crisis marked the turning point for globalization reversal. Whether the pendulum could have swung further or had reached its limit is uncertain. But once neoliberalism was called into question, one thing was certain: the public policy paradigm in many countries had swung back toward social protection. The policy instruments developed during the heyday of globalization seemed to no longer work, a situation that gave new life to industrial policy as the major tool to promote economic recovery. Under these circumstances, even the market-facilitating state in China, a product of the globalization upturn, has adopted the practice of industrial targeting and begun to implement various supportive policy instruments first used by the developmental state in Japan.

The ongoing technological revolution has shined the spotlight upon the state's role in promoting innovation in revolutionary technological frontiers. Interestingly, we see that the federal government of the United States does not strictly follow the liberal market economy but can be conceptualized as an entrepreneurial state in the context of the technological revolution. This case in point demonstrates that the state's role in development – and the role of industrial policy in particular – should be understood in a broader historical context. In the 1980s, industrial policy was perceived as suitable for only a certain stage of economic development. Through the lens of neoliberalism, industrial policy would become obsolete once a country reached "developed" status. This is why the Japanese type of industrial policy was considered "alien" by commentators and critics. But by focusing on the government's role in promoting innovation, industrial policy literature can be brought to bear on the US, which significantly enhances the perspective's legitimacy. Moreover, the industrial policy perspective is widely accepted and employed by many governments around the globe in their race to develop artificial intelligence.

The great-power competition between the United States and China is taking place amid the most profound transformation of the international order in modern history. This competition has forced the US government to confront and accept the legitimacy of industrial policy as a governmental development strategy while simultaneously forcing China to learn from the industrial policy practiced by the entrepreneurial state

in America. The fact that both of the world's largest economies have embraced industrial policy is significant. After a long denial of industrial policy's value, US policymakers have finally acknowledged its legitimacy, partly as a result of China's demonstrable ability to use it effectively. At the same time, the Chinese government has recognized the unique value of reducing risks for innovation in revolutionary technological frontiers and has acted on this realization by increasing its investments in the development of the digital economy.

Ongoing debates and discussions over industrial policy indicate that it will remain and play an important role in states' futures. But these discussions also raise many important questions, such as the extent of government subsidies, market entry when national security is at stake, the financial ramifications and responsibilities of innovation, competition policy around state-owned enterprises, labor standards, and environmental protection. Certainly, in multilateral and bilateral trade negotiations, industrial policy will be an important subject. This is merely the beginning for industrial policy. It will become more than just a tool for state intervention into the economy, but a mechanism to legitimize a state's position in the governance of the international economy in the 21st century.

**Peer-review:** Externally peer-reviewed.
**Conflict of Interest:** The author declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.
**Grant Support:** The author received no financial support for the research, authorship, and/or publication of this article.

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