

A

Introduction

All over the world, governments are actively and openly intervening in economies to boost innovation, generate new technologies, and foster cutting-edge industries. These interventions can have positive or negative impacts, especially in today's hyper-connected global economy. On the one hand, they can expand knowledge, enhance productivity and spread the essential tools of global growth and development. But on the other hand, they can also distort trade, divert investment and benefit one economy at the expense of others. International cooperation and rules are needed more than ever to ensure that governments' new focus on innovation and technology policies maximizes positive spill-overs and minimizes negative ones – and to ensure that a race for technological leadership does not morph into a struggle for technological dominance. The *2020 World Trade Report* looks at the role of innovation and technology policies in an increasingly digitalized world economy, and explains the role of the WTO in this changing context.



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1. A new wave of government policies

Governments' motives for focusing on innovation and technological development often differ.¹ Some want to accelerate or leapfrog development. Others want to build greener and more equitable economies. Still others want to achieve – or hold on to – leadership in key strategic sectors. That governments want to help economies advance is not new. What is novel is the way in which today's increasingly digitalized, data-driven and technology-rich economies seems to have strengthened the case for state intervention, and broadened the scope for smarter, more proactive, more collaborative approaches (Ciuriak, 2018a; 2019b). The COVID-19 crisis has given further impetus to the drive for such government policies, by highlighting countries' vulnerabilities in key medical sectors and spurring governments to redouble efforts to develop new vaccines, improve treatments and strengthen national economic and technological resilience.

Government policies can have both positive and negative impacts or “spill-overs” in today's hyper-connected global economy. On the one hand, national efforts to boost innovation and technology can benefit everyone if they increase the global stock of knowledge and provide countries with the technological tools they need to scale up productivity, protect the environment or improve public health. On the other hand, these same national efforts can be harmful if they entail beggar-thy-neighbour policies that distort global competition or shift economic and social costs onto other partners. While a global race for technological leadership can fuel progress – since competition is often a powerful driver of innovation – it can also fuel conflict and delay progress if it morphs into a global struggle for technological dominance.

In a world where innovation policies and economic integration can drive technological progress, but where the two can also conflict, there is an even greater need for international cooperation and rules to ensure that modern industrial policies are designed and implemented in ways that encourage positive-sum outcomes (i.e. the expansion, exchange and cross-fertilization of knowledge) and discourage zero-sum ones (i.e. the promotion of one country's technological advance at the expense of others). To this end, an effective World Trade Organization could prove more important than ever.

2. Government policies redux

This new focus on state-led technological development is a relatively recent phenomenon. In past decades, the idea that governments should actively intervene in economies with the aim of promoting specific sectors or technologies had fallen out of favour in many countries. It was argued that governments lacked sufficient knowledge of complex economies to steer them successfully (Hayek, 1945; Nelson and Winter, 1982); that governments were susceptible to political capture and thus were more apt to protect losers than to pick winners; and that, often, the problems they sought to solve were a result of “government failures”, not “market failures”, so more government intervention could make matters worse (Bach and Matt, 2005; Miller, 1984). Although it was conceded that industrial policies had produced some modest successes in the past, more often they produced, as *The Economist* bluntly put it, “a crop of whopping failures” (*The Economist*, 2010). Better to let markets decide which industries succeed or fail, and to encourage government largely get out of the way (Krugman, 1994).

But in recent years, academics and policymakers have begun to take a second look at the role that governments play in economic development and growth (Aiginger, 2014; Ciuriak, 2013; Rodrik, 2010). They point out that, at a minimum, state institutions – financial systems, legal structures, and regulatory frameworks – provide the essential “operating system” for every economy, without which markets could not function, and that the quality of these institutions can significantly influence economic success. Another important evolution in recent decades is that industrial policies have become more outward-oriented, in recognition that openness, through access to larger markets and increased competition, can lead firms to innovate. The economic literature and the experiences of many countries highlight that innovation, productivity and other key objectives of industrial policies are best served by open markets.

Governments also supply a broad array of public goods, such as education, healthcare and employment policies, that are equally essential to economic growth, and which markets do not provide. These broad social policies may seem passive, untargeted and neutral, but in their basic design and structure, they can implicitly influence an economy's trajectory – including its technological capacity – often in powerful ways. Then there are the myriad ways in which more active and targeted government policies – such as procurement, subsidies, investment incentives and trade measures – steer capital and labour into activities that the markets might not choose, giving

an initial boost to strategic industries, encouraging “learning by doing” advantages, and potentially helping to accelerate economic development and higher growth (Lucas, 1993).

The shift towards more knowledge-based economies is perhaps the main reason why industrial policies are back in the spotlight. Ideas and information, the key resources in a knowledge-based economy, are different from commodities or capital, in that they resemble “public goods” (Haskel and Westlake, 2017; Romer, 1990). While everyone benefits from them – because they are freely available and infinitely consumable – few are willing to pay for them, because then others can “free-ride” on their investment (Arrow, 1972; Nelson, 1959). Since markets undersupply these critical resources – from higher education to basic scientific research, to digital infrastructure – it falls to governments to provide and pay for them.

Thus, high-tech industries often depend on access to other technologies or information sources to function – for example, Amazon’s reliance on the internet, or Google’s reliance on Big Data – and for this to occur, a level of coordination and shared access is required that only governments can provide. Then there is the fact that many digital technologies are characterized by network effects – for example, Facebook’s attraction to users increases the more users sign up – which gives governments a key role, not just in protecting networked industries in their infancy, but in preventing anticompetitive behaviour when these industries are fully grown (see Section C). While there are always going to be market failures, these are arguably bigger and more consequential in knowledge-based economies, so there is an even greater need for government intervention to correct them (Belli, 1999).

In short, economies, especially technologically advanced ones, do not operate in a vacuum; state policies inevitably shape them. Consciously or unconsciously, actively or passively, successfully or unsuccessfully, governments are continuously engaged in designing, executing, and fine-tuning what are effectively industrial policies (Greenwald and Stiglitz, 2012).

And since it is impossible for governments not to make choices about what direction the economy should take, how scarce resources should be allocated, and what measures are most likely to produce desired outcomes, it is important for governments to get their industrial strategies right. It has been argued that the need to guard against governments distorting markets or propping up failing industries should be balanced

against the need to ensure that governments make the right strategic choices about where new skills are needed, who wins or loses from trade agreements, how regulation shapes industrial development, and where to tax and invest.

Moreover, governments’ strategic economic choices often influence more than just economies. The goals, means and distributional outcomes of state intervention can have important and long-lasting social, environmental and political implications as well. Government efforts to foster advanced technologies and industries, for example, can have a major impact on everything from corporate concentration to labour markets to wealth inequality, presenting both opportunities and challenges. If societies are to adapt to and benefit from the economic changes that governments seek to engineer, then successful industrial policies would seemingly need to encompass a broad, complex, and mutually reinforcing range of measures to help manage difficult and often painful changes, and to build a political consensus around the need for structural reform. As Dani Rodrik has argued, “The real question about industrial policy is not whether it should be practised but how” (Rodrik, 2010).

3. Government policies are as old as industrialization

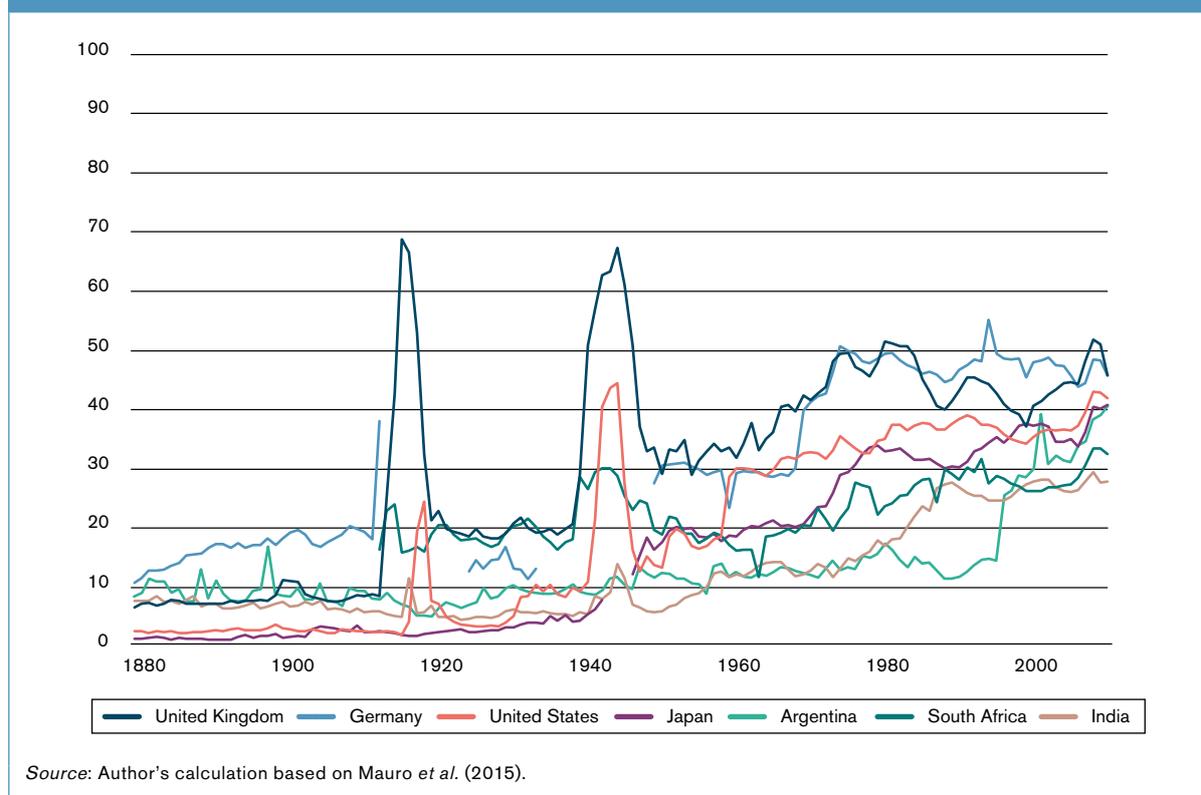
Governments have always intervened in economies,² but the nature and extent of their influence has changed over time. As economies have evolved from agrarian to industrial to post-industrial over the past century and a half, the state’s share of economic activity has steadily expanded (see Figure A.1).

While some of these rising expenditures, such as on defence or pensions, were not (or only tangentially) related to economic development, others, such as industrial subsidies, research and development (R&D) programmes or mass education clearly gave governments a greater role in shaping and steering economies, and allowed them to help determine which industries advanced, and which fell by the wayside. And the state’s economic role and policy “toolkit” expanded, industrial strategies arguably became more, not less, important, and their successes (or failures) more, not less, consequential.

Although the state’s role in 19th-century economies was extremely limited by modern standards, even the early industrializers in Western Europe and North America often used targeted policies to foster economic development, including infant-industry protection, pro-corporate legislation, intellectual

Figure A.1: Government's share of economic activity has steadily expanded

Total government spending as share of GDP



property protection and market-opening foreign policies (Chang, 2003; Shafaeddin, 1998).

However, it was the Second World War that marked the major turning point for the role of governments in the economy, subsequently sparking what has been described as a golden age of industrial policy. Governments played an unprecedented and largely successful role in mobilizing national economic resources for the war effort; this, combined with the social and economic changes that resulted from the war effort, helped to cement a broad post-war Keynesian consensus around the necessary role of governments in managing macroeconomic stability, securing full employment and encouraging industrial development. The Cold War, too, helped to reinforce support for industrial policies, as the both the United States and the Soviet Union used state power to mobilize industry and science for strategic advantage. Meanwhile, European governments increasingly turned to industrial planning to accelerate the development of strategic sectors and to narrow the perceived technology gap with the United States (Grabas and Nützenadel, 2014).

The rise of east Asian economies in the 1960s, 1970s and 1980s marked yet another turning point

for industrial policies. The vertiginous success of these economies was widely attributed not just to strong economic fundamentals, but to the state's central role in fostering public and private sector cooperation, mobilizing financial resources behind strategic industries, reallocating labour from low- to high-productivity sectors, and promoting export-led development. Indeed, perhaps their key policy innovation was to use state intervention, not to encourage inward-looking protectionism and import substitution, but to actively promote an increasingly outward-looking and export-led competitiveness strategy – in recognition of the fact that access to larger markets and increased competition would expose firms to new technologies and encourage them to innovate (Cherif and Hasanov, 2019a; Wade, 1990). Far from being antithetical to these Asian industrial policies, trade liberalization, economic integration and globalization were indispensable preconditions.

Indeed, it can be argued that many governments today do not need to “discover” new economic strategies so much as to “rediscover” old economic strategies that they had forgotten or consciously dismantled. For example, the fact that Western governments' spending on basic R&D has largely declined as a

share of GDP since the 1980s, even as emerging economies' spending has steadily increased (see Figure A.2), is both striking and potentially instructive.

4. Maximizing positive spill-overs while minimizing the negative ones – the critical role of international cooperation

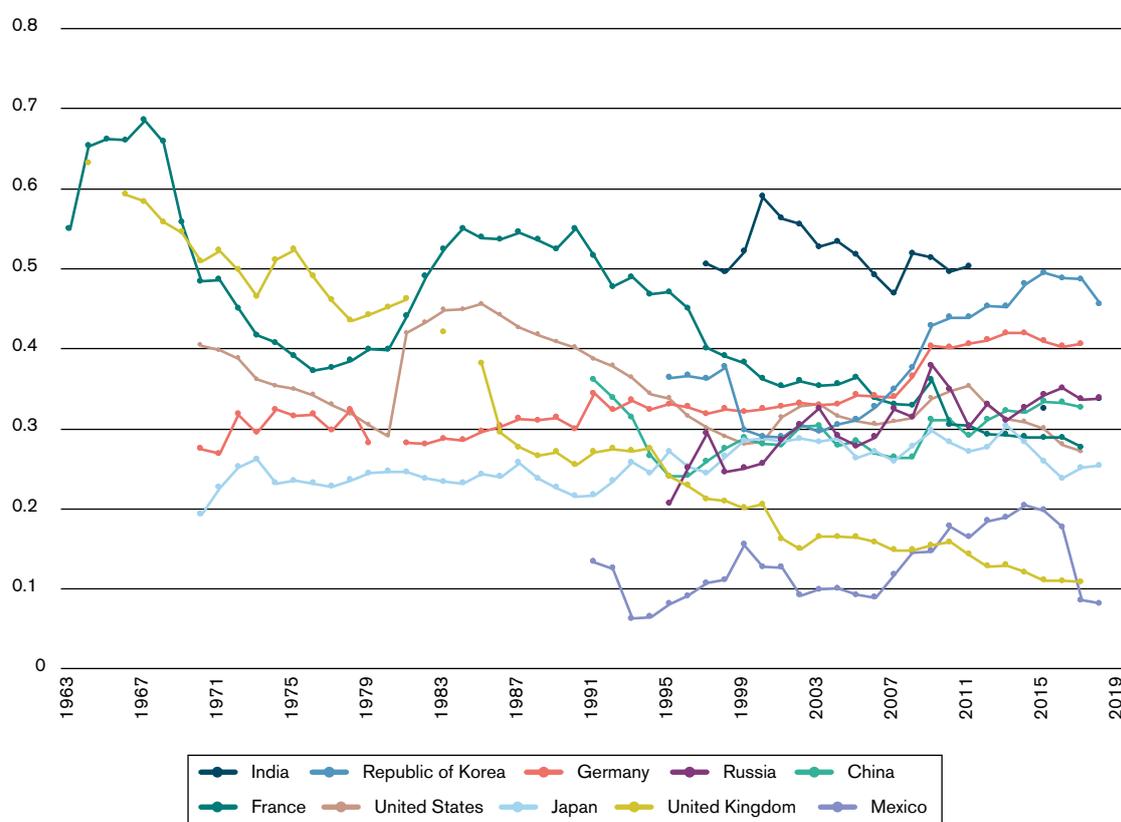
Yet government policies also have international repercussions or spill-overs – all the more so in today's increasingly integrated and digitalized global economy. Sometimes policies can have positive spill-overs for other countries, spreading knowledge, creating new industries or markets, and generating shared growth. But at other times they can have negative spill-overs – distorting trade, diverting investment or exacerbating adjustment costs in partner economies. The challenge is to provide an international economic framework that encourages positive sum outcomes and avoids zero-sum ones.

This is not a new challenge. The post-war system was designed precisely to reconcile international cooperation with national policy space and flexibility. On the one hand, the system sought to restore open world trade (by fixing exchange rates and binding tariffs) and on the other hand, it sought to restore domestic growth and employment (by preserving governments' freedom to manage interest rates, fiscal policies, and pro-employment and industrial strategies). As John Ruggie argued, it represented a system of "embedded liberalism" – a global balance between openness and regulation, capital and labour, markets and government intervention (Ruggie, 1982).

Today's multilateral trading system also aims to provide a framework of rules within which countries can advance their economic interests without compromising or harming the interests of others. The WTO's basic principles of non-discrimination, transparency and reciprocity, and the prohibition of unnecessarily trade-restrictive measures, combined with the WTO's recognition of countries' rights to maintain the policy space needed to address

Figure A.2: Emerging economies' spending on R&D has steadily increased

Government spending on R&D as share of GDP



Source: OECD Main Science and Technology Indicators (MSTI) database.

important economic, social or environmental concerns, have sought to balance the twin goals of national sovereignty and global trade integration since the WTO's inception.

At the same time, rapid and far-reaching economic and technological changes, together with governments' fast-evolving efforts to adjust to and benefit from these changes, are putting new pressure on this framework, calling into question the adequacy of existing multilateral rules, and fuelling demands for WTO modernization and reform. In particular, technology and digitalization seem to be increasing the incentives for state intervention even as they are simultaneously deepening global economic interdependence. These twin developments arguably make it both more challenging and more important to design modern industrial policies that are compatible with trade openness and to find new ways to balance countries' domestic and global interests.

This year's *World Trade Report* looks at the role of intertwined innovation and industrial policies in an increasingly digitalized world economy and explains where the WTO fits in. It looks at how an open and rules-based global trading system is relevant to ensuring that national policies can dovetail with growing global integration.

Section B explains how today's new industrial and innovation policies are truly "new" and different. It makes the point that digitalization has fundamentally changed the aim of government intervention, often in ways that make it compatible with – and not opposed to – open trade and economic integration.

Section C examines the various economic rationales for innovation policies and why the shift towards more knowledge-based economies seems to justify a larger, smarter and more proactive government role. It also looks at the wide range of instruments and policies that governments now use to boost innovation, digital adaptation and technological development, and assesses why some are more effective than others.

Finally, Section D examines how and where innovation strategies interact with global trade rules. It explains that the WTO's existing rules were designed to provide a framework – not a straitjacket – for the development and implementation of national economic policies, and suggests that the WTO's current rulebook may need updating and modernization if it is to remain relevant to the 21st-century economy.

Endnotes

- 1 The European Commission has proposed a “fresh approach to industrial policy”; Japan is exploring a new “Japan Inc.”; India has launched its “Made in India” strategy; China is advancing its “Made In China 2025” initiative; and US politicians are now openly calling for a new US industrial policy.
- 2 Although the term “industrial policy” dates from the 1970s, the arguments for its use go back as far as the 18th century. For example, prominent early arguments in favour of the selective protection of industries can be found in US Treasury Secretary Alexander Hamilton’s 1791 Report on the Subject of Manufactures, as well as in the influential work of the 19th century German economist Friedrich List.