



DATA FOR *PROGRESS*

Introduction to Industrial Policy

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Introduction

Confronting the daunting economic challenges of the 21st century — from the existential threat of climate change to the specter of massive job losses to automation — will preoccupy the world’s governments and will require novel strategies. The coronavirus crisis has highlighted, on one hand, the brittleness and opacity of the supply chains that underpin globalization and, on the other, the awesome power of government to help in a crisis. Against this backdrop, the notion of **INDUSTRIAL POLICY** (IP) — the government intervening in markets to promote particular industries and economic goals — has garnered bipartisan interest.

The scope of interventions that fall under this umbrella is broad. Generally, however, an intervention can be considered industrial policy if the government strategically aids the firms or individuals engaged in a specific industry with the goal of improving the productivity of that industry, especially in comparison to global competitors. Some representative IP interventions are:

- ▶ **TRADE BARRIERS:** for example, putting tariffs on the import of automobiles in order to shelter a nascent domestic auto industry;
- ▶ **TARGETED RESEARCH AND DEVELOPMENT FUNDING:** for example, giving grants to universities and researchers in high-impact areas, like semiconductors or genetic engineering;
- ▶ **SUBSIDIES:** for example, providing tax breaks for firms producing solar panels or their constituent components; and
- ▶ **PROCUREMENT:** for example, requiring that any cement the government uses should be green and produced domestically; or, more indirectly, requiring any firm that relies on public grant money to make its products domestically.¹

For a long time, IP has been rejected by economists because they doubted that the government could effectively improve productivity; moreover, they worried that IP would result in companies devoting all their energy to getting government aid, rather than actually increasing investment.² However, recent scholarship has recognized that many governments pursue IP anyway and it should thus be normalized; Rodrik (2008) calls on scholars to ask how to effectively pursue industrial policy rather than *whether* to do so at all.³ Notably, economists have long recognized that governments have comparative advantages and crucial roles in market economies, from enforcing contracts to pricing negative externalities;⁴ and industrial policy can be such a role.

Taking an IP approach to solving policy problems yields markedly different solutions than the so-called neoliberal approach, wherein the function of the government in encouraging or discouraging a particular economic activity is limited to policy which lowers or increases the price of that activity.⁵ Some examples of this difference are:

1 The [Bayh-Dole Act](#) is an example of regulation that codifies this.
2 Pack and Saggi (2006)
3 Rodrik (2008)
4 Krueger (1990)

- ▶ Taxes on each ton of carbon emitted (a neoliberal policy for fighting climate change) versus strict standards for clean federal procurement (an IP approach); and
- ▶ Untargeted tax breaks for research and development (a neoliberal policy for investment in science and technology) versus building manufacturing extension programs, which explicitly train workers in advanced manufacturing techniques.

The goal of this primer is to introduce IP — its rationale, examples of its implementation, and its political implications — as a legitimate and potentially useful policy lever. First, we explain the strong theoretical foundation for IP, discussing infant industries and the theory of learning by doing. Next, we survey some historical examples of IP, which empirical economists are only now beginning to rigorously evaluate. Finally, we consider the politics of government intervention in the economy and the consequences of its popularity.

Theoretical justification

The interaction between the economies of different nation-states engaging through trade is underpinned by *comparative advantage*, which is best explained by a canonical scenario in introductory economics⁶: Even if country *A* can produce more of every good than country *B*, both countries will be better off if each country specializes in the good it is *relatively* best at. However, when the theory of comparative advantage collides with reality, some countries find themselves with their advantage in extractive industries or agriculture and unable to compete in high-tech manufacturing or services that yield high profit margins.

The most well-studied justification for industrial policy is to allow countries to develop a comparative advantage in higher-margin industries by shielding these industries from global competition until they themselves can become competitive.⁷ This is known as **LEARNING BY DOING** (LBD).⁸ Under this model, companies become better and better at generating their output (i.e., can make a given amount or quality at lower and lower cost) as they become more experienced. When thrown into a global market, a new firm in a new industry would find it impossible to sell its wares, when other countries already have experience producing that ware. If the firm's country, however, restricted imports, then the firm would have buyers for its wares, and could use the profits to improve its processes and achieve competitiveness.

Models of the benefits of LBD further consider the effects to the broader economy of a particular firm or industry benefiting from government intervention. The interactions of the firms with the rest of the national economy — as a purchaser of inputs, a purveyor of high-value goods to other firms, a source of skilled employees — can lead to other industries also becoming more globally competitive and upskilling.⁹ If a government can target industries that have significant linkages to other desirable local industries, then intervention can generate a runaway positive feedback loop, whereby a large swath of the economy mutually experiences increasing returns to scale. These positive feedback loops

5 For example, taxing cigarettes (rather than banning them outright) in order to discourage smoking

6 See *Principles of Microeconomics* (Mankiw 2021) for a detailed exposition

7 Blonigen (2014)

8 Melitz (2005)

are especially promising in novel, high-impact and high-investment technologies necessary for making heavy industry green. Especially in the case of green steel or concrete, which underpin the basis of manufacturing, an initial government push to make these processes competitive will drastically cascade through supply chains. Similar examples are scalable carbon capture and storage and carbon dioxide removal technologies, which remain niche, unprofitable ventures but are increasingly crucial for restricting global temperature rise to “well below” 2 degrees Celsius, as set forth by the Paris Agreement.

Underpinning the theoretical justification for industrial policy are two major conditions (known as the Mill-Bastable test)¹⁰: (1) after some period of time, the industry will become globally competitive and no further support will be needed; and (2) the benefits that accrue from the industry becoming globally competitive outweigh the costs of protection. The costs include, for example, subsidies provided to the infant industry or the increased prices that local consumers have to pay because they cannot access the global market. While it remains difficult to know pre-intervention whether an industry will satisfy these conditions, they provide a useful framework for justifying said intervention.

It is useful here to consider the limitations of theory, especially regarding the brittleness of global supply chains. As these supply chains remain backed up in 2022, leading to fears of inflation and cascading bottlenecks, a major justification for government intervention has been to build supply chain resilience by moving manufacturing supply chains back to the United States.¹¹ This does not easily follow the LBD paradigm, since the welfare gained by onshoring a supply chain is felt only when there are trade bottlenecks. Perhaps treating supply chain brittleness as a market failure would help model the best way to encourage robustness. Similar to how insurance markets function to smooth out consumption, robust supply chains might reduce profits in good times but drastically improve outcomes during global catastrophes.

Historical evaluation

As mentioned earlier, industrial policy is, almost by default, undertaken by many governments, especially in developing economies but also in the United States. However, evaluating the *effectiveness* of those approaches has been extremely difficult, since there are many possible confounding variables that could explain the dynamics of the targeted industries. Lane (2020), in a review of industrial policy, elucidates past challenges: the inability to construct meaningful counterfactuals (i.e., how would the targeted industry have developed in the absence of the policy), insufficient disaggregation of results (e.g., using results for “manufacturing” broadly to evaluate a policy targeted only toward, say, heavy chemical industries), and inability to measure the intervention itself (e.g., non-tariff measures like environmental standards).¹² Recent advances in empirics, however, aim to remedy this state of affairs, using large datasets and careful analyses to parse cause and effect. We summarize briefly two case studies in industrial policy that illustrate the strength of these new evaluative frameworks: the effect of the Napoleonic blockade on industrialization of cotton production; and the effect of Korean intervention in the heavy chemicals industry in the 1970s.

9 Thornton, R. A., & Thompson, P. (2001)

10 Melitz (2005)

11 Endless Frontiers Act

12 Lane (2020).

One of the key difficulties of evaluating industrial policy is that the implementation of industrial policy is heavily correlated with other policy and political considerations.¹³ Historical events where these forces are disentangled are called *natural experiments*. In the height of the Napoleonic Wars in the early 1800s, after the French victory at Jena-Auerstadt, the French instituted a blockade of European ports against British exports to the continent; however, the implementation of the blockade was far more successful in northern Europe (where Napoleon's army was strongest) than in the Mediterranean (where the French fleet was in disarray). This allows Juhasz (2018) to evaluate the effect on the continental cotton industry, now insulated from the British, who were the most industrially advanced in mechanized cotton production, independently of policy considerations, since the blockade was instituted externally.¹⁴ Her analysis finds that the bout of protectionism did indeed spur the mechanization and productiveness of northern French cotton industries, providing a clean empirical case study to bolster the theory above.

A more modern example, which highlights the power of disaggregated, high-resolution data, is Korea's push for industrialization in the 1970s under President Park Chung Hee. Again, external forces bracket the policy, with President Nixon's withdrawal from Asia providing the initial spur and Park's assassination its conclusion. Before 1973, South Korea was heavily dependent on the United States' support against the North, and Nixon's sudden pivot away from Asia forced South Korea to kick-start its industry. Park's policy was explicitly and finely targeted toward heavy and chemical industry (HCI), and, most importantly, the policy fell apart when he was assassinated in 1979. This creates a natural experiment, where the trajectory of the HCI can be compared to other industries in these different epochs. Lane (2021) uses high-resolution data on industries that were targeted versus not targeted to analyze their trajectories.¹⁵ Moreover, he is able to detect *indirect* subsidies — rather than protection, intermediate goods for targeted industries were subsidized — made visible only by parsing the high-resolution data.

The upshot of these and other case studies¹⁶ for the policy-maker is twofold: First, they provide evidence that industrial policy can indeed be effective in the real world, supporting the theoretical models; and second, they span a wide range of types of industrial policy and goals to achieve, allowing policy-makers to better understand what works and what does not.

Politics of intervention

While we have mostly focused on the *economic* forces that drive industrial policy, it is crucial to remember that it is inherently a product of *both* politics *and* economics, and so political considerations cannot be ignored. In fact, several of the popular forms of government intervention that constitute industrial policy have consistently polled well across the political spectrum. For example, 79 percent of respondents claim to be overwhelmingly in favor of the government purchasing goods made in America,

13 For example, a country that effectively targets industrial policy might in general be better at pursuing growth-friendly policies; in that case, it is difficult to tell whether any growth is a result of industrial policy or some other policy considerations.

14 Juhasz (2018)

15 Lane (2019)

16 See, for example, Mitrunen (2019) on spillover in Finland; Jaworski and Smyth (2018) in the U.S. airframe industry; and Hanlon (2018) on comparative advantage in steel shipbuilding.

and a majority thinks that domestically produced goods are higher in quality and easier to purchase, even if more expensive.

Thus, from a political standpoint, the tenets of industrial policy offer a seemingly unique opportunity for building a broad coalition that cuts across polarization. Ends that are priorities for progressives (clean energy, environmental justice, high labor standards) can be linked to means that are appealing to conservatives (supporting American businesses and workers). Particularly, the populism championed by the modern political right, especially by former President Trump, is not explicitly against government intervention. All that remains is for the intervention to be put in service of political and social goals.

From a progressive standpoint, one of the most compelling cases for industrial policy is for fighting climate change and developing a green economy. For example, fighting climate change will require massive investments in measuring and mitigating emissions, developing clean energy and manufacturing technologies, and ensuring that climate justice is a priority —all of which require high-resolution monitoring and mapping of emissions and air quality. Heavy governmental intervention in developing these technologies can help the U.S. become a world leader in these essential technologies, while also achieving the political goal of onshoring manufacturing jobs. In general, the implementation of standards — environmental, worker treatment, carbon border adjustments or climate clubs — serves as an indirect form of protectionism that can help develop socially desirable industries, and potentially spill over into a generally cleaner economy.

It should be noted that, for many critics of industrial policy, its popularity is not a convincing argument in its favor. Populism itself is the problem (see Hartwell (2021), which shows that populist policy can lead to volatility). In other words, industrial policy is the “junk food” that, while attractive to all in the short term, will lead to longer-term issues, such as rent-seeking behavior and lower efficiencies.¹⁷ However, as discussed previously, recent economic scholarship has argued persuasively against this characterization of industrial policy as junk food. As Rodrik lays out, the crucial question is *how* to design an industrial policy to avoid rent-seeking. Crucially, work by proponents of industrial policy have separated industrial policy and rent-seeking from their classically automatic association — creating space for the category of IP *without* rent-seeking.

Outlook for IP

Combating climate change, fixing brittle supply chains, balancing the benefits of globalism and automation with its concentrated costs: These are all recognized as massive challenges requiring economic, political, and technological solutions. Most observers also recognize that the free market alone is insufficient, and *some* government action is both necessary and urgent. We have argued here that IP is a worthwhile lever to pull — both theory and historical evidence indicate its efficacy in promoting the

¹⁷ See Naudé (2010) and Chang (1993) for the connection between industrial policy and rent-seeking, and Baldwin (1969) and Krueger (1990), who argue that the rent-seeking made IP in East Asia deleterious

growth and competitiveness of the desired industry. As importantly, the popularity of IP among voters cuts across the otherwise seemingly impassable lines of polarization that threaten to block all progress.

The current administration has certainly shown initiative in centering IP in its Build Back Better agenda, notably through the United States Innovation and Competition Act (USICA), which recently passed the Senate, and its House counterpart, the America COMPETES Act, which broadly expand domestic manufacturing capacity and aim to build resilient supply chains, especially for crucial components like semiconductors. Even more ambition, and a thorough exploration of which industries and technologies are the most crucial to target, is absolutely necessary to build the resilient and advanced manufacturing capacity required to provide good jobs and tackle climate change.