

The Political Economy of Industrial Policy

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Industrial policy, or state action meant to shift the composition of economic activity, has been controversial since the birth of economics. Economists have long studied, dissected, and taxonomized the market failures that might justify an industrial policy intervention. Juhász, Lane, and Rodrik (2023) group the theories into three main categories. The category of “externalities” includes negative externalities like environmental harms, as well as positive externalities like learning by doing, national security, or good jobs. The category of coordination or agglomeration activities involves situations where an industry can be affected by the availability of complementary goods, services, or related downstream and upstream activities. Public goods can also be industrial policies when they target specific types of economic activity. The category of public good provision arises when private production depends on adequate regulation, education, infrastructure, or law enforcement.

When it comes to pursuing industrial policy, however, political and economic forces are inevitably intertwined. In fact, economists’ apprehension about industrial policy is actually less about the economic rationales per se than it is about the political economy of industrial policy (Krueger 1990). In reality, politics means that

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the practice of industrial policy will look very different from what simple theory prescribes.

For example, consider industrial policies that promote infant industries. These arise when a market failure (for instance, a learning-by-doing externality) prevents the industry from emerging at market prices. In theory, a temporary policy, such as a limited period of import tariff protection, will raise the domestic price, incentivizing producers to enter the market. Importantly, the tariff only needs to be in place temporarily while the industry moves down its long-run cost curve through its experience in learning by doing. At this point, the domestic industry becomes competitive and the policy is discontinued (for example, Bardhan 1971).

The infant industry idea has been known for a long time. It appears in Alexander Hamilton's (1791) *Report on Manufactures* (as discussed by Sylla in this symposium), but it breaks through into the canonical economics literature in the writings of John Stuart Mill (1848). However, Mill's later correspondence shows that he had been receiving letters about how his careful discussion of short-term and temporary import protection for an infant industry was being used as justification for permanent protectionism. Mill (1868) responded to one correspondent in these terms:

[I]ndustries artificially fortified, even though it be professedly for a time only, raise up private interests which combine, as they have done in the United States, but too effectually, to convert what was intended as a temporary expedient into a permanent institution . . . These considerations have greatly shaken the consideration I expressed in my book; and though I think that the introduction of a foreign industry is often worth a sacrifice, and that a temporary protecting duty, if it was sure to remain temporary, would probably be the best shape in which that sacrifice can be made, I am inclined to believe that it is safer to make it by an annual grant from the public treasury, which is not so likely to be continued indefinitely . . .

Other prominent economists of the time followed a similar intellectual trajectory. Alfred Marshall was an early advocate of industrial policy but pivoted after observing the policy play out in the United States: "[P]rotective policy in fact was a very different thing from a protective policy as painted by sanguine economists" (Irwin 1991; Marshall and Whitaker 1975, p. 93). Frank Taussig (1914), in his early empirical study of nineteenth-century US infant industry tariffs, noted that professedly short-term industrial policies had a way of enduring.

In modern terms, industrial policies can suffer from time inconsistency. Infant industry policy may be counterproductive in the absence of government commitment: after all, if firms believe the government will extend the policy indefinitely, they may underinvest in the cost reductions required to become competitive in international markets (Matsuyama 1990; Tornell 1991). However, infant industry programs have sometimes overcome this challenge; for example, Taiwan's Industrial Development Bureau withdrew temporary protection for local producers of

VCR players when the industry failed to become internationally competitive (Wade 1990).

More broadly, the infant industry example illustrates that industrial policy is a deeply political phenomenon. Industrial policies are chosen by policymakers operating in political institutions. These politicians belong to coalitions, are swayed by constituents, wield power (formal and informal), and care about retaining it. Industrial policies have distributional consequences and impact firms, sectors, and regions, as well as workers and owners of capital. Their benefits and beneficiaries are often specific and identifiable, while their costs are often diffuse, making them a potent way to target political constituents. Thinking in practical terms about industrial policy immediately and unavoidably dunks us into the world of political economy.

In short, understanding the patterns of what industrial policy is enacted, how policies evolve, their palatability, and why policies succeed or fail requires a political economy of industrial policy. In this paper, we consider the political forces shaping how industrial policy is chosen and the dimensions of state capacity shaping how industrial policy is implemented.

Strangely, modern political economic analysis of industrial policy is scant, even amid the new body of economic research on industrial policy. Our goal is to make modest inroads toward a more robust political economy of industrial policy. We demonstrate the utility of this framework using case studies and data on industrial policy practice, drawing on data from Juhász et al. (2022). Our paper combines insights from across the social sciences with the language of the economic field of political economy. Indeed, the research literature on comparative social science and comparative politics has long considered how politics and noneconomic forces shaped the use of industrial policies (notable examples include Wade 1990; Haggard 1990; Evans 1995; Chibber 2002). The crescendo of recent industrial policies across the United States, the European Union, China, India, Brazil, and elsewhere has made understanding the political economy of these policies all the more pressing.

In the next two sections, we structure our discussion of the political economy of industrial policy around (1) political constraints for what choices are made and (2) capacity constraints that affect implementing these choices. In our discussion of political constraints, we consider the case of climate change policies. On economic principles alone, carbon pricing is part of a first-best policy response to the market failures associated with carbon emissions. Yet, carbon pricing policies have often proven difficult to implement, including, famously, in the United States. In contrast, industrial policies targeting green activity have proliferated. This case illustrates key ways in which political realities affect which climate policies are adopted. More generally, we examine the ways in which political constraints such as time inconsistency and political credibility impact and, at times, undermine industrial policy, as well as how thoughtful industrial policies may work to overcome these constraints.

The second section illustrates capacity constraints using the experience of export-promotion industrial policy in Thailand, where domestic politics first precluded and then supported the adoption of East Asian-style industrial policy

in the 1970s and 1980s. The state's inability to effectively implement its desired industrial policy contributed to the failure to shift the economy towards export promotion in the 1970s. In contrast, investments in the Thai state's ability to design, deploy, and monitor industrial policy supported a more successful export boom in the 1980s. Indeed, we argue that virtually every successful industrial policy episode has involved substantial new investments in state capacity. More generally, we consider the tension between the need for capable, autonomous bureaucracies and the reality that industrial policy is designed and deployed by political and, at times, politicized entities. We also explore how industrial policy agencies navigate the informational challenges posed by doing policy well.

In our view, a political economy of industrial policy is neither naïve nor fatalist about the challenges of conducting industrial policy. Instead, we offer a constructive confrontation with the dilemmas facing policymakers. We depart from an earlier generation of political economy work in that we do not view government failure as a necessary feature of industrial policy. Rather, it is endogenous—more likely to emerge when industrial policies are chosen beyond a country's political and capacity constraints. One implication is that any economy should be wary of brashly mimicking the policies pursued in other places: after all, successful industrial policies need to work within their political economy environment, and these particulars may vary and shift.

Political Constraints

In this section, we consider how political realities impose constraints on choices about industrial policy (Drazen 2000; Persson and Tabellini 1990). We begin with a case study discussion of the role of political constraints in choices about climate policy. We then build on this example to identify two particularly salient types of political constraints that influence industrial policy choices: (1) how the policy-making process introduces issues of political credibility and time inconsistency and (2) the constraints posed by the reality that politicians wish to hold power.

Case Study: Political Constraints Facing Green Industrial Policy and Carbon Pricing

The experience of green industrial policy is a tale of political constraints. We refer to green industrial policies as those that aim to change the domestic structure of economic activity towards lower-carbon technologies. The primary justification for such policies, of course, is the environmental damage from carbon and carbon-equivalent emissions. But alongside the negative externality arising from carbon emissions, there is a second set of potential market failures associated with the innovation needed to invent and diffuse low-carbon or carbon-neutral technologies. As a result, the first-best policy may be a combination of carbon taxes, which we would not call green industrial policy, and direct subsidies for clean-energy innovation and adoption, which is clearly a form of green industrial policy (Acemoglu et al. 2016).

Theoretically, the market failures around carbon emissions present a glaring case for carbon, or Pigouvian, pricing: that is, using tax or emissions trading schemes to equate the private and social costs of carbon. In terms of economic efficiency, pricing carbon is seen as low-cost, simple to administer, market-based, and less invasive than the alternatives. Moreover, there is evidence that carbon pricing also incentivizes firms to invest in energy-efficient technologies (Colmer et al. 2023). Consider the case of Norway’s principal energy firm, Equinor (previously Statoil), which invested in carbon capture and storage technology in response to the substantial carbon tax introduced by the country in 1991 (Rathi 2024).

Among economists, green industrial policies have been far more controversial. These policies are seen as inferior to carbon pricing, especially in terms of efficiency. Unlike a single carbon price, green industrial policies target specific domestic activities and do so using a wide array of different instruments—some more inefficient than others. Examples of such policies are subsidies for research and development in new green technologies (likely part of a first-best policy response), guaranteed premium prices for electricity generation from renewable sources (“feed-in tariffs”), or targeted support for the domestic production of green products (like electric vehicles, wind, or solar). Some green industrial policy instruments may even, perversely, *slow* the transition to net zero emissions, at least in the short run. For example, many countries have placed stringent local content requirements on the production of wind turbines, solar panels, and electric vehicles. While these policies potentially boost the domestic supply chain, they may also risk raising the domestic price of renewables, lowering demand, and impeding their deployment. Such dilemmas have only underscored the economic appeal of carbon pricing.

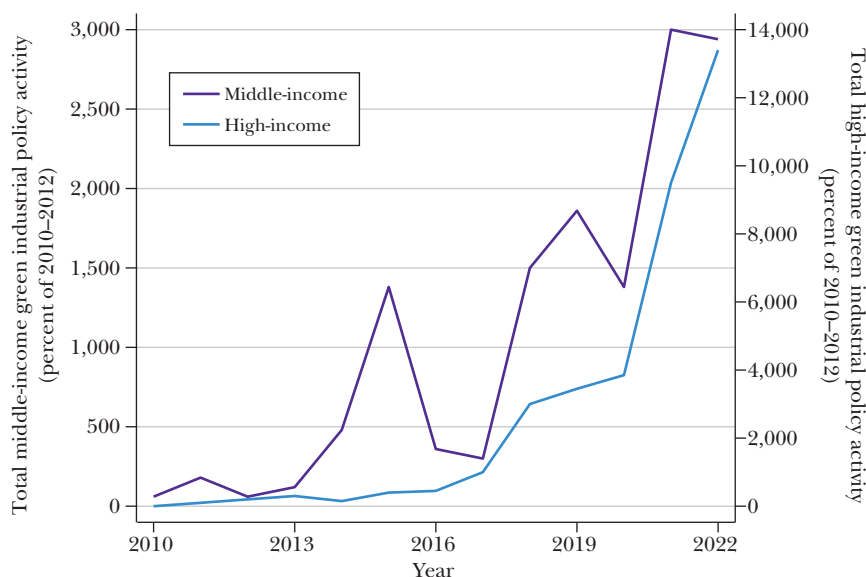
For these reasons, price-based policies have become the preferred vehicle for addressing climate change among economists. The “Economists’ Statement on Carbon Dividends,” which advocates for a US carbon price, has been signed by 28 Nobel laureates in economics, four former chairs of the Federal Reserve, and 15 former chairs of the US Council of Economic Advisors (at <https://www.econstatement.org/>). In the words of the former managing director of the International Monetary Fund (IMF), Christine Lagarde, “[p]rice it right, tax it smart, do it now” (quoted in Ball 2018, p. 134).

However, green industrial policies have proliferated while the adoption of carbon pricing policy has been more problematic. In fact, after decades of efforts to implement carbon prices, the World Bank (2024) estimates that less than 1 percent of global emissions are covered by a carbon price above the recommended level, and only 24 percent of global emissions face any carbon price at all. The United States, the world’s second-largest emitter of carbon behind China, has no federal price on carbon.

As a starting point for discussing the recent diffusion of green industrial policy, we use the first comprehensive dataset on global industrial policy practice from Juhász et al. (2022). This dataset uses natural language processing and a supervised machine learning model to identify industrial policies from the Global Trade Alert dataset, an independent organization set up in 2009 to track international

Figure 1

Green Industrial Policy Activity in G20 Countries, 2010–2022 (Annual Count of Policies Relative to 2010–2012 Average)



Source: Green industrial policies are classified based on the industrial policies identified in Juhász et al. (2022), who use data from the Global Trade Alert. High- and middle-income status is classified using data from the World Bank.

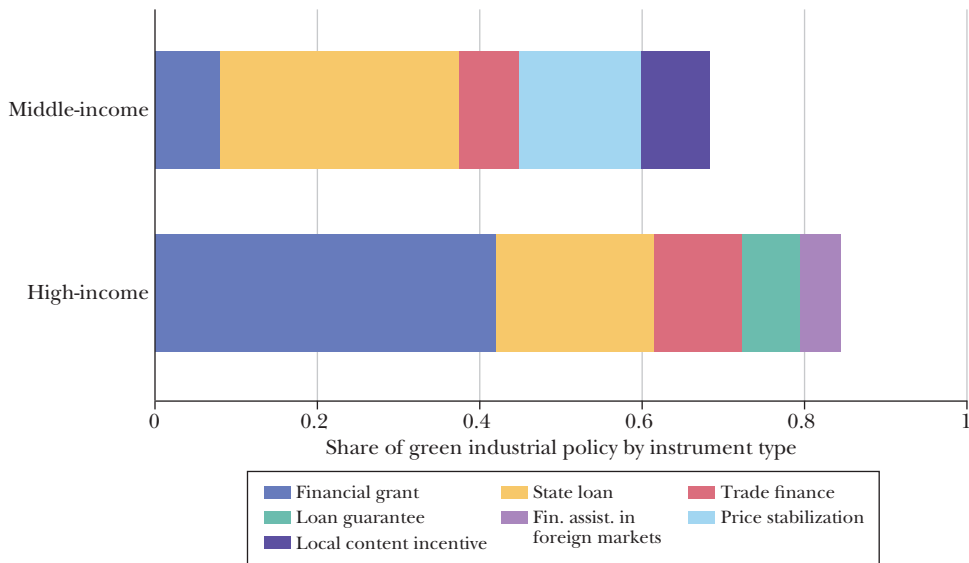
Note: An industrial policy is classified as being “green” if the text of the policy description contains keywords associated with green policies. G20 countries are listed in online Appendix A.

commercial policy activity. Importantly, Global Trade Alert attempts to capture all types of policies (for example, producer subsidies, tariffs, and consumer subsidies) that discriminate (positively or negatively) against foreign producers over domestic ones. We use the Juhász et al. (2022) database to extract green industrial policies, which we identify using a dictionary of green policy keywords (for a description, see online Appendix A.1).

Figure 1 illustrates the dramatic expansion of green industrial policies over the past decade. Specifically, we plot trends in green industrial policy activity across the Group of Twenty (G20) countries, which includes the European Union and 19 of the other largest world economies. Together, the G20 countries account for about 85 percent of global GDP and about two-thirds of the global population. In this analysis, we divide countries into high- and middle-income status using World Bank definitions. Figure 1 shows that green industrial policy activity has risen sharply across both middle and high-income economies. While there was little growth in

Figure 2

Top Five Green Industrial Policy Instruments across G20 Economies by Income Group, 2010–2022



Source: This figure represents green industrial policies by instrument type (top five instruments only). An industrial policy is classified as being “green” if the text of the policy description contains keywords associated with green policies.

Note: Green industrial policies are classified based on the industrial policies identified by Juhász et al. (2022) using the Global Trade Alert database. High- and middle-income status is classified using data from the World Bank.

green industrial policy activity until about 2015, we see a “hockey-stick” type time trend across both middle- and high-income economies starting later in the 2010s.

Which green industrial policies, specifically, are behind these trends? In Figure 2, we plot the share of industrial policy activity by the type of instrument, focusing on the most popular measures. Across both high- and middle-income countries, the most common instruments tend to be targeted financial grants and fiscal instruments, such as loans, loan guarantees, and trade financing for green activities. Among these are less controversial policies, such as green research and development subsidies.

However, Figure 2 also shows the relative popularity of more controversial local content incentives among middle-income economies. Examples include Chinese consumer subsidy programs from the early 2010s for the purchase of energy-efficient household goods (like refrigerators, air conditioner units, and television sets) that met local content requirements. Similarly, loans for wind generation from the Brazilian National Bank for Economic and Social Development (BNDES) have been

tied to local content requirements. Despite the limitations discussed above, local content incentives may benefit domestic producers in countries behind the technology frontier; absent such conditions, the subsidies and other incentives of these green policies may benefit producers abroad. Local content incentives also make an appearance in high-income countries, as in the US Inflation Reduction Act of 2022, in which tax credits for electric vehicles or renewable electricity generation are subject to local content requirements.

The global diffusion of various green industrial policies in Figures 1 and 2 stands in contrast to the difficulties of implementing carbon pricing. What explains this difference?

Despite its economic attractiveness, the political constraints for carbon pricing have been formidable (Furceri, Ganslmeier, and Ostry 2023). The costs of carbon taxes are immediate, while the benefits accrue in the future. These costs cut across traditional economic and political coalitions: consumers and producers, labor and capital, and political left and right constituencies. Across political systems, these dynamics have worked to the advantage of opponents who are able to veto climate policies (Mildenberger 2020). Hence, carbon pricing has been politically contentious, inspiring researchers to focus on their political constraints (for example, Jenkins 2014; Karapınar 2016; Cullenward and Victor 2020). Leading carbon pricing researchers have declared that political acceptability is a first-order concern; for example, Klenert et al. (2018, p. 669) argue that “[t]raditional economic lessons on efficiency and equity are subsidiary to the primary challenge of garnering greater political acceptability.”

In numerous settings, carbon pricing has threatened industry incumbents, who have become pivotal antagonists in the politics of carbon pricing (Brulle and Downie 2022; Basseches et al. 2022). The most prominent US emissions trading legislation, the American Clean Energy and Security Act of 2009 (commonly known as the Waxman-Markey bill) was sunk by lobbying from expectant losers, including nonemitting industries indirectly exposed to potential losses (Meng and Rode 2019; Cory, Lerner, and Osgood 2021). The year before, Canada’s Liberal Party imploded, a loss driven in part by a controversial national carbon tax scheme that earned the ire of carbon-intensive provinces and constituents. Carbon pricing wins have also generated political blowback (Pahle et al. 2022), sometimes with dramatic reversals as has occurred in Australia, France, Switzerland, and the state of Washington. In contrast, the carbon-pricing experience has been smoother for early adopters, like Sweden and Finland, with more amiable political climates and weaker incumbents (Meckling, Sterner, and Wagner 2017; Harrison 2010).

Politics has also constrained ratified carbon-pricing schemes in ways that have rendered them less effective. Carbon pricing wins—carbon taxes and trading systems alike—have required political bargains with varying degrees of concessions, exemptions, and rebates. The result is that the price of carbon is often too low. This was true for the world’s largest carbon pricing scheme, the EU Emissions Trading System, which passed as a politically feasible alternative to failed European carbon taxes. In the European Union, tax policy would have required unanimous support

from member states, whereas the Emissions Trading System was packaged as an environmental policy and faced lower political hurdles. To garner early buy-in, the European Union gambled by providing firms with carbon emissions allowances. Although the move cultivated industry support and constituencies for the Emissions Trading System, it also inspired intense lobbying efforts over these allowances. Subsequently, the Emissions Trading System experienced a significant period of over-allocation that depressed the price of tradeable permits to emit carbon (Sato et al. 2022). These issues are by no means unique to the EU effort, and trading schemes grapple with over-allocation and low prices due to both technical and political constraints (Quirion 2021; Jenkins and Karplus 2017).

Political realities have also meant that the administrative burden of carbon pricing can be quite large. In theory, a carbon pricing system is parsimonious: it simply administers a single global price on carbon. In practice, a patchwork of different carbon pricing policies has emerged across localities. Geographic differences in carbon prices introduce the challenge of “carbon leakage,” where instead of reducing carbon emissions, they simply shift them to locations with a low carbon price. Closing such loopholes is difficult and administratively burdensome. Indeed, the European Union is currently grappling with implementing a Carbon Border Adjustment Mechanism (CBAM), effectively a tariff on carbon-intensive imported products, to level the playing field between domestic and foreign emitters. Hence, politics complicates the theoretical appeal of administering a single carbon price—with the additional wrinkle of coordinating global policy.

Compared with the political tumult of carbon pricing, green industrial policies carry manifest political advantages. Where a carbon price is a “stick,” green industrial policies provide “carrots” to certain sectors or activities, making them powerful policy tools with which to build political constituencies for decarbonization efforts. With immediate concentrated benefits and diffuse costs, green industrial policies have thus been supported by both voters and firms (Meckling and Karplus 2023). Where a uniform carbon price cuts across sectors, the targeted nature of industrial policies means that they can be tailored to individual sectors and bridge constituencies across political environments (Cullenward and Victor 2020). Take, for example, a popular green industrial policy in electricity generation, the feed-in tariff, which guarantees a premium price for electricity generated from renewable sources such as wind and solar. One explanation for their widespread use across rich and poor countries alike is that they benefit politically valuable rural constituents. Bayer and Urpelainen (2016) argue this advantage explains the proliferation of this tool across democracies, specifically, its ability to simultaneously woo renewable energy producers and influential rural constituents.

Furthermore, political scientists and policy designers have noted that green industrial policies seem to provide a means of *shifting* the political environment in favor of carbon taxes. By creating the sectors and jobs that eventually benefit from carbon pricing, green industrial policies, in fact, tilt the future political landscape to one more favorable of Pigouvian policy. This pattern has been documented across varying political settings globally. Green industrial policies preceded pricing policies

in nearly two-thirds of the cases studied by Meckling et al. (2015). In California, which has become a well-studied case in these feedback dynamics, aggressive public support for renewable development dates back to the earlier policies in the 1970s (Biber 2013). Renewable industry constituencies have underpinned continual policy expansion, staved off reversals, and helped split traditional anti-climate policy coalitions. For instance, policies have promoted green energy production by utilities, who, in turn, became advocates of larger, subsequent reforms (Vormedal and Meckling 2023; Kim, Urpelainen, and Yang 2016).

The experience of climate policies shows us that whatever the arguments for economic efficiency, political feasibility is a binding constraint. Although carbon pricing and green industrial policy are often discussed as substitutes, the political economy of industrial policy provides a more dynamic view. Political economy also hints at the potential of a portfolio approach to climate policy. Increasingly, economists (Blanchard, Gollier, and Tirole 2023) argue for the advantages of multi-pronged approaches to addressing climate change, ones where green industrial policies play a role. They do so by complementing current carbon pricing schemes and through their potential to shift the politics of larger-scale reforms to confront climate change.

Yet, green industrial policies are not immune to their own political constraints, where less efficient interventions, such as feed-in tariffs, may be more politically feasible than measures like green research and development, which directly target technological constraints to clean energy (Harrison, Martin, and Nataraj 2017). Similarly, much like the risks facing infant industry policy (discussed above), the beneficiaries of green industrial policy may well lobby for them to be kept in place long after the rationale for them has expired. We now turn to such political challenges in more detail.

Political Credibility and Time Inconsistency

Industrial policies often have long time horizons and require politicians to commit to a sequence of policies over time. In the infant industry promotion policies discussed earlier, dynamic learning-by-doing externalities take time to be realized. It is also true for green industrial policy, which may require firms to invest in risky new technologies and products. The dynamic nature of these policies introduces issues of political credibility and time inconsistency, which can act as real-world constraints to effective industrial policies.

In practice, this setting presents a variety of challenges for policymaking. If a policy is not credible, firms will underinvest in ways that undermine the policy itself. For example, in the case of infant industry promotion, if the policymaker cannot credibly commit to removing a protective import tariff after a certain period, firms are not incentivized to undertake the investments that would make them competitive. Conversely, the threat of policy reversals can complicate their political credibility. Green industrial policies pursued across North America and the European Union face the threat of such policy reversals (Vihma, Reischl, and Anderson 2021; Marquardt, Oliveira, and Lederer 2022). As Stern (2022, p. 1271)

makes clear, “[g]overnment-induced policy risk is one of the major deterrents to [green] investment.”

The political constraints posed by political credibility and time inconsistency are not unique to industrial policy, in fact, such issues permeate monetary and fiscal policy. A large body of work in normative political economy is dedicated to thinking about how to design institutions and policies that overcome such challenges. Most prominently, political economists have emphasized the power of delegation (Persson and Tabellini 1999), in which aspects of policy are devolved to independent organizations insulated from political forces. Indeed, some instances of industrial policy, such as those used in post–World War II Japan, have featured institutional delegation—an issue which we return to in our discussion of “state capacity” below.

However, institutional design is itself a political choice. Although monetary policy has been delegated to independent authorities, the distributive and particularist nature of fiscal policy has made delegation less common. Nevertheless, the world has seen a proliferation of fiscal councils and fiscal rules meant to overcome issues of political credibility (End 2023; Larch and Braendle 2018). Independent industrial policy institutions (discussed below) also exist. In the realm of trade reform, supranational authorities and multilateral agreements have lent outside credibility to trade policy reform (Rodrik 1995; Staiger 1995). As international organizations find their footing during the current industrial policy renaissance, one wonders if supranational bodies can play a similar institutional role in credible industrial policy. This consideration may be especially relevant with the return of industrial policy in the European Union, where EU-wide institutions govern the forms of state aid pursued by member states.

Although delegation may be possible for industrial policy in certain contexts, for better or worse, much of industrial policymaking is likely to remain firmly in the domain of politics. In these contexts, the question of designing policy in the face of these constraints is essential. In her guide to what makes industrial policy work, Harrison (2024) provides a framework for better design: industrial policy should correct market failures, consult the private sector, promote competition, and—importantly—*conclude*. Specifically, she considers the ways in which legislation can be written to expire, sunset, and terminate. This means designing industrial policies that “self-destruct,” mitigating risks that policies become entrenched.

Policy Choice, Political Equilibria, and Political Power

When are the appropriate industrial policies chosen, if at all? Industrial policy is the outcome of a political equilibrium, which is shaped by the desire of policymakers to hold power.¹ When industrial policy shifts the structure of economic activity, it often creates winners and losers. For example, policies that promote green energy production may threaten coal-belt politicians (Hess 2014). When economic policy

¹This section adopts the framework of Acemoglu and Robinson (2013) and Robinson (2010), and draws on Persson and Tabellini (1990), Drazen (2000), and Bueno de Mesquita (2016).

choices carry political consequences, they may work against policymakers' incentives (Acemoglu and Robinson 2013). For example, our case study suggests that carbon pricing policies are less appealing in practice than in theory because policymakers perceive them as politically risky. Hence, the political environment shapes which industrial policies are chosen. Taking political economy seriously, Robinson (2010) considers the two ways in which industrial policies are adopted: (1) working within constraints posed by the current political equilibrium or (2) shifting the political equilibrium itself. It is worth unpacking each.

First, policymakers can propose an industrial policy that works within the current parameters of the policy environment: extant coalitions, key players, current administrative capacity, and so on. Such policies may be more politically pragmatic and employ the existing pockets of state competencies. The multipronged nature of the Inflation Reduction Act of 2022 in the United States has been criticized for its array of objectives, which include decarbonization, the creation of "good" jobs, and reshoring supply chains from geopolitical adversaries. Seen through the lens of political economy, the wide range of objectives may make it more feasible to pass such legislation by appealing to multiple constituencies. Indeed, the local content requirements tied to different policies in the legislation ensures that the tax credits provided for politically contentious decarbonization goals benefit local producers, making the goals more politically palatable.

Thus, working within current political constraints can lead to outcomes that are "second best, at best," in the face of the political rules and dilemmas facing policymakers (Dixit 2009; Rodrik 2008). Our case study in the next section describes how Thailand was initially unsuccessful at mimicking the export-led policy of East Asian neighbors but was eventually able to adopt a version that worked within its distinct political constraints.

Second, rather than working within the constraints of the current political equilibrium, the political equilibrium can shift; for example, a policy can empower beneficiaries whose incentives are aligned with the industrial policy. This may sound abstract, but this is exactly the logic seen in the case study above, where green industrial policy creates constituencies—and thus shifts the political equilibrium—for future carbon pricing.²

The main message of this section is that while the choice of industrial policy needs to account for economic principles, it also needs to account for the local political environment, which requires attention to the political institutions and the political incentives they promote, the key players, the distribution of power, and how policy may alter it. The experience of climate policy illustrates how political realities shape which policies are chosen and how the policy choices today may modify the future political equilibrium. Accounting for the political environment also implies that policies that emerge in one political context are not guaranteed to

²This observation opens up questions as to the parameters of policy advice and the degree to which economists ought to internalize the political incentives of policymakers. For a discussion, see Dixit (1997) and Zingales (2020).

work within another. Our case study of Thai industrial policy in the 1970s and 1980s below illustrates this point.

State Capacity Constraints

State capacity—and its role in deploying policy—has become an essential ingredient in explaining long-run development and the divergent experiences of post–World War II industrialization (Evans 1995). Just as many East Asian economies demonstrated an ability to pursue policies that supported development and industrialization, the post–World War II period also produced a rogue’s gallery of predatory states, such as those in the Philippines, Ghana, and Zaire, that became case studies in botched policymaking (Killick 2010; Boyce 1993). History is littered with five-year economic plans that were ill-conceived or vastly outstripped the ability of states to implement them. Historically, moves toward industrial policy have required thinking about state capacity.

It would be wrong to think of state capacity as static and exogenous, especially in the context of industrial policy. Positive and formal political economics sees such capacity as the endogenous outcome of investment decisions made by governments subject to their political environment (Besley and Persson 2011). For example, underlying the development success story of South Korea was one of continual investment in bureaucratic capacity. This capacity was by no means exogenous. Under General Park Chung Hee in South Korea, “[t]he developmental state was not a given, but a human artifact” (Kim 2011, p. 86), one cultivated by continual investment and political choices. In fact, the postwar South Korean state was initially seen as weak; there was not a developmental state waiting to be helmed, and the state Park “inherited was a politically demoralized and technically backward institution” (Kim 2011, p. 86).

In this section, we begin with a case study of how Thailand attempted to reshape its industrial policy from the 1970s onwards with mixed success. Thailand’s experience illustrates both of our main themes; namely, how the political realities discussed in the previous section constrain and shape the industrial policies that are chosen, and how state capacity affects the ability to execute the industrial policy successfully. With this case study for reference, we then focus on two dimensions of state capacity that dominate industrial policy considerations: (1) bureaucratic capacity, or the ability to implement policy, and (2) embeddedness and informational capacity, the ability of bureaucracies to interact with and exchange information with the private sector.

Case Study: Export-Led Industrial Policy in Thailand

Thailand is a useful lens for considering how political and capacity constraints shaped their ability to pursue a style of industrial policy popular in some East and Southeast Asian economies that focused on assisting certain industries—via instruments such as cheap loans, outright subsidies, and technological assistance—to develop so they could expand their exports.

In the 1950s, Thailand's military-dominated governments pursued an inchoate form of import substitution industrialization—a developmental strategy focused on replacing imported industrial goods with domestic production. Thai-style import substitution did not embody grand developmental strategies but served important practical (in terms of trade and revenue) and political purposes, helping maintain fragile post–World War II politics.

Export enthusiasm came to Thailand in the early 1970s under the government of Field Marshal Thanom Kittikachorn (Hewison 1987). The experience of earlier East Asian export-promotion success stories, like South Korea, Taiwan, and Japan, resonated with Thailand's technocrats, and export aspirations marked Thailand's Third Five-Year Plan (1972–1976) and the Export Promotion Act of 1972.

However, Thailand could not fully pursue an all-out export drive like those pursued by its East Asian counterparts. For a time, Thailand supported a contradictory mix of export promotion and import substitution, or what was called “export-oriented protectionism” (Poapongsakorn and Fuller 1997, p. 480). For example, where South Korean export policies allowed *de facto* import liberalization for exporters (Westphal 1990) so that exporters could purchase imported goods as inputs at world prices, Thai policy did not. Such import support was politically infeasible, given the industries reliant on protection were important constituencies. Although Thai exporters were given rebates from the import tariffs on their intermediate input purchases, the rebates were insufficient and mismanaged (Christensen et al. 1990). In fact, Thailand protected critical machinery and intermediate goods without adequate relief for exporters and even raised protection for capital goods throughout the decade (Wiboonchutikula 1987).

While the pressures of Thai politics made it difficult to roll back the tariffs of import-substituting industrialization, a weak development bureaucracy stymied the shift to export promotion. Despite spurts of reforms, Thailand had not invested in a developmental bureaucracy, and through the 1970s, oscillating military and civilian governments (mostly the former) politicized swaths of the economic bureaucracy. Developmental bodies, replete with duplication, were just vehicles for political patronage (Rock 1994; Doner and Ramsay 2000). The effect was a balkanized and fragmented developmental apparatus (Crouch 1984). The Thai Board of Investment, a key industrial strategy body, lacked the “capacity to monitor promoted firms, much less to impose any clear performance standards on them” (Doner and Ramsay 1997, p. 252). Where countries like South Korea developed systems for scrutinizing export incentives in the 1960s so that only firms who showed an ability to export were eligible for support, Thailand in the 1970s lacked the administrative capacity to condition support in this way.

Another important factor prevented an export push in the 1970s: the exchange rate for the Thai baht was overvalued. Thai political constraints made devaluation improbable, unlike in post–World War II Taiwan and South Korea, whose politics allowed—or even compelled—they to pursue politically difficult devaluations, which were preconditions for robust export promotion. In Thailand, powerful key political players, from business groups to military elites, favored a strong baht. For

instance, a strong baht favored the military's foreign procurement, and similarly, importers and firms borrowed US dollar-denominated capital (Doner and Ramsay 2000; Warr 1993, pp. 43–44). This status quo would remain until the 1980s.

Only in the 1980s did a coherent export-promotion policy emerge in Thailand, promulgated by a new regime that seized upon a window of opportunity. This shift was the by-product of multiple crises that emerged in the 1970s—civil unrest, coups, and deepening economic crisis. The chaotic interregnum led to a new semi-democratic political equilibrium helmed by Prime Minister Prem Tinsulanonda (1980–1988), who brokered power between newly empowered political parties and traditional military interests (Doner and Laothamatas 1994). Under this “Premocracy,” technocrats and pro-reform parties emerged as salient political constituents. Together, these forces created the conditions to realize a true export promotion strategy. Muscat (1994, p. 195) summarized the situation: “[N]o previous Thai government had been under the kind of severe and sustained economic pressure that now brought the technocrats to the conclusion that a thoroughgoing shift to an export orientation could no longer be delayed, and . . . an export orientation of institutional factors would be central to a successful policy.”

Export promotion—this time in earnest—became a top priority under Prem and “coincided with significant technical strengthening of the infrastructure of the Thai state”—choices supported by party politics and external international institutions (Rock 1995; Muscat 1994, p.753). A substantial institutional development program was initiated to improve the government's policy analysis and implementation capabilities. These investments in state capacity created the conditions necessary to rationalize economic and industrial policy. Combined with pressure from the World Bank's Structural Adjustment Programs and IMF assistance, the political climate allowed the Prem government to finally push through currency devaluations in 1981 and 1984, despite strong resistance from the military and incumbents. The move symbolized fledgling state autonomy. Broadly, under Prem, Thailand shifted from a clientelist state to a form of “liberal corporatism,” where a relatively autonomous state bargained with key constituents (Laothamatas 1994).

For instance, private-public bodies proliferated through the 1980s and were seen as instrumental for promoting exports—and Thailand's development success more broadly (Doner and Ramsay 2000). Most famously, the Joint Public-Private Sector Consultative Committee was established in 1981 and was conspicuously modeled after Japanese institutions. Chaired by the prime minister, the Joint Public-Private Sector Consultative Committee convened monthly meetings between state agencies and business groups to coordinate policy and to elicit information on export incentives. Thailand also followed the path of Korean export agencies, launching a successful Department of Export Promotion. Such reforms facilitated a more robust export strategy; import protection offsets, ineffective in the 1970s, were now widely used by the 1980s, and export credit covered over 50 percent of exports by 1983 (Herderschee 1993). The state planning authority, the National Economic and Social Development Board, organized public-private partnerships to promote

investment in the hospitality sector, establishing what “may well have been the single most important export policy success of the 1980s” (Rock 1995, p. 752)—tourism.

While Thailand’s political environment of the 1980s supported a more robust export-oriented policy, the Thai route was distinct. Although commentators drew parallels between Thai private-public efforts and other countries in East Asia, ascendant business groups and lobbies exercised far more power over the state in Thailand. Thailand’s outward-oriented interventionism echoed aspects of South Korea’s, however, Thailand could not fully pursue key pillars of Korean policy (for example, import liberalization for exporters), nor could it adopt the more complex industrial policies seen elsewhere, such as active state involvement in the research and development process that pushed firms further towards the technology frontier (Christensen and Siamwalla 1993). Nevertheless, policymakers acted on windows of opportunity to pursue a strategy—and invest in bureaucratic capacity—that worked within Thailand’s political economy. By doing so, Thailand pursued an export-oriented industrial policy that was more successful than predicted (Doner and Ramsay 2000; Rock 1994).

The Thailand experience with industrial policy illustrates several of our main messages. First, the political environment and capacity constraints inhibited the ability of Thailand to adopt wholesale the East Asian-style export-oriented industrial policy in the 1970s. Second, once the political environment shifted in the 1980s, outward-oriented industrial policy became more workable, including relaxing political barriers to currency devaluation. Policymakers used windows of opportunity to pursue a form of export promotion that was workable within Thai politics. Third, the case underscores the importance of state capacity, which at first stymied the adoption of East Asian policies. The Thai experience of the 1980s showed the importance of investment in bureaucracy, including deliberative institutions that worked well within Thailand’s political economy.

Bureaucratic Capacity and Autonomy

The Thai experience illustrates that implementing industrial policies requires *bureaucratic capacity*, that is, the ability of an administrative agency to execute and monitor the policies chosen by politicians. Administrations need resources, capital, staff, technology, and knowledge to do policy. Industrial policies can be particularly capacity-intensive to administer; they often require deep knowledge of the markets and firms with which they interact, regular data, technical expertise, and more. Where dimensions of bureaucracy capacity matter for economic development (Besley et al. 2022), the quality of bureaucracies becomes paramount in pursuing rational policies.

Bureaucratic autonomy, in particular, has been an essential feature of bureaucratic capacity in the world of industrial policy. By “autonomy,” we mean the ability of bureaucratic agencies to have a meaningful degree of independent authority and discretion to implement policies (Bersch and Fukuyama 2023). Autonomy is promoted by limiting political interference in managerial procedures, staff hiring, and internal promotion decisions, reducing the constraints on bureaucratic operations, and more. Given the political temptations surrounding industrial policies

(discussed in the previous section), the autonomy bureaucracies have over policy has been vital for successful industrial policy.

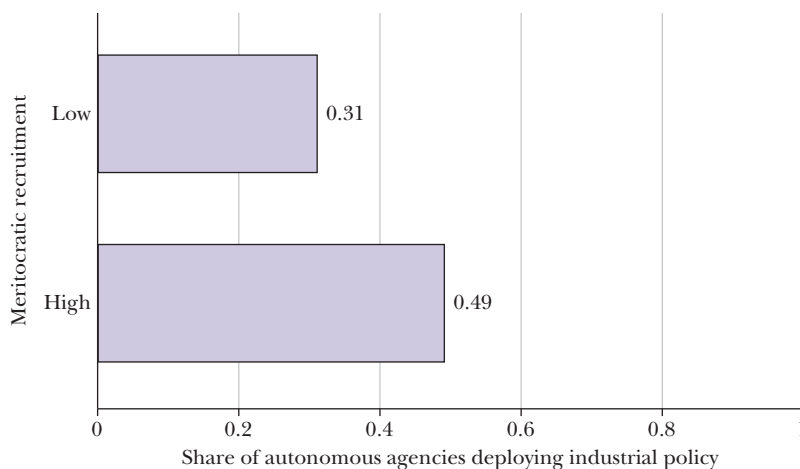
In practice, what does bureaucratic autonomy mean for industrial policy? To answer this question, we collect data on the public entities or formal bodies that implement industrial policies. We do so using the textual descriptions of industrial policies that appear in the Juhász et al. (2022) industrial policy dataset from the G20 group of jurisdictions. Specifically, we extract the names of public entities from policy descriptions with the help of prompts fed through OpenAI's ChatGPT application programming interface (for details, see online Appendix A.2). This yields a dataset of unique public entities that oversee industrial policy.

Our first observation is that industrial policy is deployed by many different types of public entities. Perhaps most familiar are government ministries (like Argentina's Ministry of Productive Development or South Africa's Ministry of Finance) that enact industrial policies, and state-owned financial institutions (like Brazil's National Bank for Economic and Social Development, or China Development Bank) that provide financing, often at below-market rates, for industrial policy projects. In addition, many G20 jurisdictions have public entities with much narrower mandates. Recent examples include Australia's Critical Minerals Facility, which finances projects aligned with the country's critical minerals strategy, and India's Solar Energy Corporation, tasked with facilitating the implementation of the country's "National Solar Mission." We also see instances of state-owned enterprises deploying industrial policy. For example, in 2010, Russian Railways, a state-owned railway company, implemented a policy providing subsidized transport rates for domestically produced cars to the Russian Far East. Similarly, the Saudi Arabian Saline Water Conversion Corporation (a state-owned utility) announced an import ban in 2009 on water desalination equipment to support the government's plan for increased domestic production in the sector.

Next, to capture one salient dimension of bureaucratic autonomy, we classify each public entity as "autonomous" if they are run by civil servants or other nonpoliticians (using the methodology developed by Field [2024], and discussed in online Appendix A.2). We consider an individual to be a politician if that person holds a political position or is affiliated with a political party. For example, government ministries and departments are typically headed by individuals holding the political position of "cabinet minister." These bodies are not classified as autonomous. On the other hand, Australia's Critical Minerals Facility (managed by Export Credit Australia) is led by the chief executive officer and chair of Australia's Critical Minerals Facility, and each have over 25 years' experience in the related fields of banking and financial services respectively and no easily identifiable political affiliation. We classify this entity as being autonomous from the government (for more examples, see online Appendix A.2).

In Figure 3, we plot our measure of autonomy against a standard measure of bureaucratic quality, the level of meritocratic recruitment, from the Varieties of Democracy (V-Dem) project. This country-level measure of meritocratic recruitment captures the extent to which state administrators are appointed based on credentials

Figure 3

Share of Autonomous Agencies Deploying Industrial Policies among G20 Countries, 2009–2022

Source: The public entities deploying industrial policy are collected from the text of industrial policies identified by Juhász et al. (2022), who use data from the Global Trade Alert. Data on meritocratic recruitment are from the Varieties of Democracy (V-Dem) project (Coppedge et al. 2024).

Note: We define a public entity as autonomous if it is run by civil servants or other nonpoliticians. We split our sample of G20 into two groups based on whether the country's meritocratic recruitment, as assessed by V-Dem, is above the G20 sample median. The share of autonomous entities deploying industrial policy within each group is defined as the mean share of autonomous agencies among the countries in the group.

rather than arbitrary criteria, such as personal or political connections (via Besley et al. 2022). Figure 3 splits countries into two groups based on whether their level of meritocratic recruitment is above or below the median level among the G20 sample, and the x-axis shows the mean share of autonomous industrial policy entities.

As Figure 3 shows, countries with high levels of meritocratic recruitment across the bureaucracy in general also tend to have more autonomous administrative bodies implementing industrial policy. Hence, for industrial policy, bureaucratic autonomy is higher in places where bureaucracies have higher levels of meritocratic recruitment. Indeed, historical evidence suggests that the pilot development agencies that deployed industrial policy in countries such as Japan, South Korea, or Taiwan evolved to have elite selection criteria, meritocratic promotion, and long, stable career paths (Johnson 1982). Highly trained civil servants staffed key economic institutions, and their incentives promoted longer-run policymaking.

Importantly, however, despite the strong case for delegating industrial policy to autonomous bureaucracies, Figure 3 shows that much of contemporary industrial policy tends to be guided by political bodies. Even among G20 countries characterized by higher levels of meritocratic recruitment, 49 percent of the agencies implementing industrial policy are headed by politicians. Thus, Figure 3 indicates

that much of industrial policy deployment is firmly in the political realm. Once again, we see that industrial policy is shaped by local political realities and constraints.

Up to this point, we have considered bureaucratic autonomy in terms of the nuts and bolts of *implementation*. However, the autonomy of bureaucracies to *formulate* policy may also be important for industrial policy design. Because industrial policies are complex, skill-intensive, and require careful design, there may be a case for delegating the details of policy formulation to higher-capacity bodies.³ In post–World War II Japan, the pilot industrial policy agency—the Ministry of International Trade and Industry (MITI)—practiced what Chalmers Johnson (1982) famously called “administrative guidance,” de facto power in shaping (and not simply implementing) the industrial policy of the 1950s and 1960s, which Johnson saw as consequential to policy success.

We can also see the power of delegating design in contemporary policymaking. Comparing the success of California’s climate policies to Germany’s more disappointing outcomes, Meckling and Nahm (2018) argue that bureaucratic autonomy in policy design was essential for crafting effective policy in California. Importantly, California’s legislature set the policy goals, so politics was not entirely absent from the policy formulation. Similarly, Fernández-i-Marín, Knill, and Steinebach (2021) show that measures of environmental policy quality—and in particular, whether the policy mix is constructed to address the specific issue at hand—are associated with discretionary policy crafting power given to bureaucracies across OECD economies.

Of course, as discussed in the first section above, politicians will often wish for policymaking to remain firmly in the political realm. Modern political economic theory is filled with reasons for why sensible economic reforms may not come to fruition, particularly in the case of policies with distributive effects (Blinder 1997; Alesina and Tabellini 2007). Additionally, there are good reasons to believe democracies may want elected representatives involved in industrial policymaking rather than unelected civil servants.

We conclude this section by noting that industrial policy almost certainly requires additional and ongoing investment in bureaucratic capacity. For one, states are out of practice when it comes to the sweeping, capacity-intensive forms of industrial policy that are emerging across the post-COVID world. In all shapes and sizes, however, industrial policies have expanded rapidly across the globe (Juhász et al. 2022). Likewise, the existing bureaucratic capacity to perform industrial policy is low; underinvestment is seen in the OECD, in presidential systems, and in European democracies (Bednar and Lewis 2024; Fernández-i-Marín et al. 2024a, b). The history of industrial policy shows us that their success hinges critically on bureaucratic capability and autonomy. Yet, state capacity does not fall from the sky, nor is it static. That is, good industrial policies invest in bureaucracies. We will go so far as to make this claim: if industrial policies are to succeed, repeated investments in administrative capacity are a *must*.

³In keeping with the arguments in the previous section, some authors argue it is optimal to delegate design when policies have concentrated political stakes and are prone to time-inconsistency issues (Alesina and Tabellini 2007, 2008).

Embeddedness and Information

Implementing industrial policy not only requires a high-quality bureaucracy, but one that continually interacts, negotiates, and exchanges information with industry and stakeholders more broadly. Successful industrial policy is not passively deployed from commanding heights, nor is it inert. Rather, it is informed by and executed through continual interactions with market participants. Civil servants are not omnipotent, and uncovering the nature of market failures requires ongoing input from those with domain expertise. Firms may face a myriad of bottlenecks, including lack of finance, difficulties procuring land, skill shortages, and administrative barriers. New policies can bring heightened prominence to constraints: for example, across the United States, the rollout of the investment subsidies for clean energy in the Inflation Reduction Act of 2022 brought to the fore the concern that local permitting issues could hinder or block desired investment in new factories (Brouns 2023). Likewise, debates surrounding industrial policy often involve the informational limits of bureaucracies (Maloney and Nayyar 2018). This section examines the relationship between bureaucracies and private actors as a source of information exchange.

The idea of *embeddedness*—the extent to which bureaucracies have connections with the business sector—was developed by Peter Evans (1995) to describe a key feature of developmental bureaucracies. Evans explains how South Korea’s dynamic random-access memory (DRAM) project, led by Korea’s Electronics and Telecommunications Institute (ETRI), was not undertaken by the state in isolation. On the contrary, the *chaebol*, large Korean business groups, were incorporated into the decision-making process, including planning, implementation, and collaboration between government and private sector researchers. From South Korea’s monthly export promotion meetings to Japan’s use of deliberation councils, East Asian states purposefully cultivated embeddedness by institutionalizing interactions between firms and bureaucracy. At its height, East Asian industrial policy was marked by webs of collaboration between bureaucratic agencies and the private sector (Birdsall et al. 1993; Doner, Ritchie, and Slater 2005).

Embeddedness actually informs industrial policy practice across the income distribution, such as the US Advanced Research Projects Agency (ARPA) model or Peru’s *Mesas Ejecutivas* (known as *mesas* or ME) (Juhász, Lane, and Rodrik 2023). The case of *mesas* is particularly instructive in how durable industrial policy bodies can be built in lower-capacity environments. Established in 2015, *mesas* are regular, weekly private-public working groups dedicated to solving sector-specific policy. Ghezzi (2017) explains how *mesas* help identify market and coordination failures and, importantly, can triage and expedite solutions across government bureaucracies. As coordinating bodies, institutions like the *mesas* have a low fiscal footprint and, in fact, were implemented as an alternative to costly external consultations (Ministry of Production 2016).

In seminal qualitative work, Breznitz (2007) provides a positive political economy description of how three small open economies—Israel, Ireland, and Taiwan—chose different forms of embedded bureaucracy to promote moves into

high technology industries. These embedded agencies were instrumental to each country entering fast-paced, competitive information technology markets, yet they did so with wide institutional variation. Where the Taiwanese state was directly involved in the industrial research and development process (for example, the Industrial Technology Research Institution), Irish agencies took a more advisory and advocacy role (for example, the National Software Directorate). These features shaped both the industrial policies that were chosen and where countries entered fragmented, hi-tech supply chains. Hence, there was no single recipe for success, but numerous ways in which small, open economies deployed embedded institutions to coordinate entry into dynamic, global industries.

Among the other benefits of embeddedness, it facilitates the flow of information between bureaucracy and industry. Doing so is essential for industrial policy given fundamental *informational asymmetries* between bureaucrats (principals) and the firms with which they interact (agents). Consider a green industrial policy, where a public agency subsidizes risky projects that, if successful, would generate both private and social benefits. How should the agency design conditional subsidies? Meunier and Ponssard (2024) show that when firms and public agencies have symmetric information about the probability of a project's success, rewarding success is optimal. However, under asymmetric information, where only the firm knows its probability of success, failure should be rewarded (!)—as it mitigates the windfall profit that arises when an agency subsidizes projects that would have received financing absent the subsidy. This insight speaks directly to the experience of the French Agency for Ecological Transition (ADEME), a public agency monitoring innovative activities for the energy transition funded by the Investments for the Future Programme. At the outset, ADEME used flat subsidies, but evidence of windfall profits quickly emerged in some projects. Therefore, the agency introduced “repayable advances,” which are subsidies that need to be paid back in the case of success—that is, they are subsidies for failure.

Such informational asymmetries are not unique to industrial policy, but are inherent in many settings, particularly regulation and antitrust. These problems have inspired a storied literature on regulatory policy design and incentive mechanisms (for an overview, see Baron 1989; Armstrong and Sappington 2007). This literature highlights the importance of considering the institutional constraints bureaucracies face and the hard work necessary for designing policy under imperfect information. Depending on the challenge the government is trying to solve, embeddedness with the private sector may be an alternative to designing mechanisms that take the informational asymmetry as fixed, as Sabel (2004) and Rodrik (2014) argue. This outcome is particularly likely where the principal may not know what needs to be done to achieve public goals, and instead, the government and private sector work together in a discovery process. The *mesas* above offer one such example.

Embeddedness, however, can cut both ways. Dense links between the state and industry also introduce the potential for capture and predation. Among other things, embeddedness requires the bureaucratic independence and autonomy

described above. This balancing act is what Evans (1995) famously called “embedded autonomy,” where both are required for industrial policy to succeed. Autonomy without embeddedness risks flying blind and constructing and deploying industrial policy in isolation from essential stakeholders. Embeddedness without autonomy risks incoherence and policies guided by private interests.

What then determines investment in state capacity, especially autonomous and embedded bureaucracies? Ultimately, these are political decisions. As Thailand’s example shows, the political environment is key to understanding not only what industrial policy is chosen but also whether the accompanying investments in state capacity take place.

Conclusion

Variation in the practice of industrial policy is as much political as it is economic. Market failures and economic constraints often govern how economists view optimal policy, yet the political forces—especially the two dimensions of political constraints and state capacity—influence heavily how these interventions are realized. This conclusion is uncontroversial through the lens of modern political economy; in fact, it is the *raison d’être* of positive political economics (Persson and Tabellini 2002; Drazen 2000). Yet, in the specific realm of industrial policy, economists have paid far too little attention to the political conditions that have supported good industrial policy. If the empirical literature of industrial policy is far underdeveloped relative to practice, the positive political economy of industrial policy is even more anemic.

This paper has considered two prominent governance constraints to industrial policy, and our analysis highlights that productive industrial policy can and has been deployed within these constraints in various contexts. While working within these governance constraints is, in our view, necessary for industrial policy to succeed, it is not a sufficient condition. Thus, our take offers a pragmatic and carefully optimistic view of the possibility of overcoming government failure and the challenges of governance. We view these as important ingredients in producing more successful industrial policies.

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