The Political Economy of Industrial Policy*

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Abstract

We examine the ways in which political realities shape industrial policy through the lens of modern political economy. We consider two broad "governance constraints": i) the political forces that shape how industrial policy is chosen and ii) the ways in which state capacity affects implementation. The framework of modern political economy suggests that government failure is not a necessary feature of industrial policy; rather, it is more likely to emerge when countries pursue industrial policies beyond their governance capacity constraints. As such, our political economy of industrial policy is not fatalist. Instead, it enables policymakers to constructively confront challenges.

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1 Introduction

Industrial policy is inherently political. For industrial policy, or state action meant to intentionally shift the composition of economic activity, political and economic forces are inevitably intertwined. Economists have long studied, dissected, and taxonomized the market failures justifying these interventions. Theoretically, justifications are numerous (Juhász et al., 2023). Practically, however, the real world—especially the political world—quickly confronts anyone seriously considering industrial strategy. In fact, the apprehension of economists surrounding policies is not often about the economics of industrial policy per se but rather about the political economy of industrial policy (Krueger, 1990). Strangely, however, modern political economic analysis of industrial policy is sparse, even amid the new body of economic research on industrial policy. The crescendo of recent industrial policies across the US, EU, China, and beyond has made understanding the political economy of these policies all the more pressing.

Industrial policy is a political phenomenon—and deeply so. Industrial policies are the outcome of political processes and carry political stakes. Their benefits are often concentrated, and their costs diffuse. They can be politically controversial. By changing the economic equilibrium, industrial policies may potentially upset the political status quo. Market failures and economic constraints may shape policy choices, but so do the political incentives of policymakers. In practice, the industrial policies we get (or don't get) are those consistent with our political world. Thus, economics alone is likely insufficient to explain the vast differences in industrial policy experience.[1] Political economy is key to comprehending the patterns of policy practice, how policies evolve, their palatability, and why policies succeed or fail. It should also inform policy design.

Thus, understanding industrial policy requires a political economy of industrial policy. This paper is a bird's-eye view of just that: using the language of modern political economics. We consider the political economy of *policy choice* and *implementation*. Specifically, (i) the political forces shaping how industrial policy is chosen and (ii) the dimensions of state capacity shaping how industrial policy is implemented. Beyond economic constraints, these governance constraints to industrial policy mean industrial policy looks far different from ideal economic optimums. Put another way, political actualities shape the policies we end up with and explain why they're often different from "optimal" policies—that is, those chosen by a social planner.

By exploring the political and capacity constraints that face industrial policy, our goal is to make small inroads toward a more robust political economy of industrial policy. We

[1] Comparative social science and comparative politics have long considered how politics and non-economic forces shaped the use of industrial policies, notably Wade (1990); Haggard (1990); Evans (1995); Chibber (2002).

demonstrate the utility of this framework using case studies and data on industrial policy practice, drawing on Juhász et al. (2022). While a rich literature in comparative political and social science has explored the political determinants of industrial policy, robust work on the analytical political economy of industrial policy is still emerging. Our work thus combines insights from across the social sciences with the language of the economic field of political economy.[2] We highlight the following findings that emerge from our discussion.

First, our framework implies that industrial policy should consider the realities imposed by the political world. A policy incongruent with these constraints is prone to government failure. Our view of government failure is different, however, from the specter of government failure raised by scholars of public choice decades ago. In our view, government failure is not a necessary feature of industrial policy. Rather, it is endogenous and likely to emerge when industrial policies are chosen beyond a country's political and capacity constraints. An implication is that we should be wary of unconditionally mimicking the precise policies pursued elsewhere. We illustrate this with the experience of export-promotion industrial policy in Thailand, where domestic features first precluded and then supported the adoption of East Asian-style industrial policy in the 1970s and 1980s. Successful industrial policies are ones that work within their political environment, and these particulars may vary.

Second, a political economy of industrial policy also reveals that the political challenges facing policymakers are not unique to industrial policy. We discuss how time inconsistency and political credibility may plague infant industry policy, yet they also plague much of monetary and fiscal policy, too. Seen through the lens of political economy, governance constraints on industrial policy are just that: constraints. Positive political economy helps explain the nature of these constraints, and normative political economy helps us design institutions to overcome them. In some cases, the political constraints posed by second-best industrial policy are, in fact, not as steep as those faced by first-best policies. We illustrate this with the case of green industrial policy. A political economy of industrial policy is, thus, not fatalist but enables a constructive confrontation with the dilemmas facing policymakers.

Third, working within the current political environment doesn't mean governance constraints are immutable. On the contrary, many thoughtful industrial policies are designed with an eye to relaxing constraints. Our case study of climate policy illustrates that green industrial policy may, in fact, help *relax* the political constraints to future carbon pricing policies. Successful industrial policies have often developed the state capacities needed to effectively design, deploy, and monitor those industrial policies. We argue that virtually every successful policy episode has involved substantial new investments in state capacity.

We structure the paper around the political economy of policy choice and implementation: political constraints (Section 2) and capacity constraints (Section 3), respectively. We illustrate

[2]The world of political economy is inherently interdisciplinary. We use "modern political economy" as a shorthand for the post-1990s developments in economics.

each using a case study; one on current climate policy and one on adopting East Asian-style industrial policy in Thailand.

2 Political Constraints

Industrial policies are chosen by policymakers operating in political institutions. They 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. In this sense, industrial policy is particularist (Blinder, 1997). Where their benefits are concentrated, their costs are often diffuse, making them a potent way to target political constituents. Their allocation is governed not only by economic logic but the logic of distributive politics (Weingast, 1994). Thinking practically about industrial policy immediately dunks us into the world of political economy. It's unavoidable.

In this section, we consider how political realities impose constraints on the policy choices beyond those faced by a social planner (Drazen, 2000; Persson and Tabellini, 1990). We refer to these forces as political constraints. We focus on two particularly salient political constraints that influence industrial policy choices. First, we consider how the policymaking process introduces issues of political credibility and time inconsistency. Second, we consider the constraints posed when industrial policy results from a political equilibrium where politicians wish to hold power.

2.1 Political Credibility and Time Inconsistency

Industrial policies often have long time horizons and require politicians to commit to a lengthy sequence of policies over time. The dynamic nature of these policies introduces issues of political credibility and time inconsistency. Consider the case of optimal infant industry policy. Theoretically, an intervention occurs during the period when an infant industry moves down its long-run cost curve and should be discontinued once the domestic industry becomes competitive (*e.g.*, Bardhan, 1971; Melitz, 2005). Much to their dismay, early economists saw that infant industry policies looked far different from the policies suggested by theory. Early infant industry advocate Alfred Marshall had a change of heart after observing them in the wild 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). Free trade critics of infant industry policy observed that industrial policies had a way of lingering, a phenomenon documented in early studies on U.S. infant industry tariffs by Frank Taussig (1914).

The sequential nature of policymaking and the exigencies of real-world politics introduce a myriad of temptations for policymakers to deviate from the path of optimal policy. In other words, industrial policies suffer from time inconsistency and thus may not be politically credible. Infant industry policies, for example, have a habit of sticking around because when the time comes to remove them, there is always pressure from vested interests to keep the policy in place. When government policy is not credible, it introduces suboptimal behavior. In the case of infant industry policy, if firms believe the government will extend the policy indefinitely, they may underinvest in cost reduction to become internationally competitive. Theoretical work has explored how infant industry policy may be counterproductive in the absence of government commitment (Matsuyama, 1990; Tornell, 1991). At times, however, infant industry programs have overcome these challenges; for example, Taiwan's Industrial Development Bureau was comfortable withdrawing temporary protection for local producers, which they did for the local VCR market when it failed to become internationally competitive (Wade, 1990).

The issue of political commitment is particularly daunting in the face of uncertain, potentially hostile future politics. Long-run policies are surely susceptible to political modifications and even reversals. This has been the case for climate policy. Australia famously wavered with carbon pricing, eliminating its Pigouvian carbon tax in 2014, only a few years after its introduction. Governments in Canada and the US withdrew from international climate agreements (Kyoto and Paris, respectively). Likewise, green industrial policies pursued across North America and the EU face the threat of similar reversals (Vihma et al., 2021; Marquardt et al., 2022). Like the case of the dynamic infant industry policy above, firms may underinvest in the face of political uncertainty. As Sir Nicolas Stern makes clear, "[g]overnment-induced policy risk is one of the major deterrents to [green] investment" (Stern, 2022, p. 1271).

While these issues pose challenges for industrial policy in practice, it is important to note that they are not unique to industrial policy. On the contrary, similar challenges 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 these challenges. To a certain extent, the lessons learned from these domains are informative about industrial policy. Most prominently, political economists have emphasized the power of delegation (Persson and Tabellini, 1999) where aspects of policy are devolved to independent organizations insulated from political forces. Indeed, some instances of successful industrial policy, such as that of postwar Japan, have featured institutional delegation, an issue we return to in Section 3.

Institutional design, however, is itself a political choice (Acemoglu et al., 2008). Although monetary policy has famously been delegated to independent policymaking authorities, the distributive and particularist nature of fiscal policy has made delegation less common. In this way, industrial policy shares much in common with fiscal policy, which has tended to remain politicized despite the advantages posed by delegation. 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 bodies around industrial policy exist too, though they are less well-studied. In some prominent cases, independent investment bodies have become an important vehicle for delivering green industrial policy, as in the case of Germany's Kreditanstalt fuer Wiederaufbau (KfW) (see: Geddes et al. 2018). 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 industrial policy renaissance, one wonders if they and supranational bodies can play a similar institutional role in developing credible industrial policy. This is especially relevant for the European Union and considerations of state aid.

While delegation may be desirable for industrial policy in certain contexts, this is not always the case, particularly where the distributional effects of industrial policy loom large. For better or worse, much of industrial policymaking is likely to remain firmly in the domain of politics. In these contexts, the political constraints emphasized in this section must be accounted for when designing policy. Specifically, the question of designing policy without political commitment. Accounting for the political dynamics of policy requires thinking more precisely about the relationship between policy and political power, which we turn to next.

2.2 Policy Choice, Political Equilibria, and Political Power

Understanding the patterns of industrial policy requires understanding the constraints arising from the politics of policymaking, particularly the role played by political incentives. Industrial policy choice is the outcome of a political equilibrium, one shaped by policymakers' desire to hold power.[3] Especially when economic policy impacts the political power of policymakers, they may not be fans of industrial policy choices. After all, in their effort to change the structure of economic activity, industrial policies often create winners and losers. This is famously seen in policies promoting industrialization, which may threaten agrarian powerholders (Acemoglu and Robinson, 2005). Policies that lift trade barriers may threaten politicians supported by protected industries (Khanna and Yafeh, 2007). Policies that promote green energy production may threaten coal-belt politicians (Hess, 2014). Hence, when economic policy choices carry political consequences, they may work against policymaker's incentives. Acemoglu and Robinson (2013) describe the hazards of interventions that violate the "political incentive-compatibility constraints" of policymakers.

Hence, the choice of industrial policy hinges on the nature of the political environment—the political institutions, the distribution of power, and, importantly, the political incentives of the policymakers. Robinson (2010) uses this idea to consider the two ways in which

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

industrial policy is adopted, i) either working within constraints posed by the current political equilibrium or ii) shifting the political equilibrium itself. It is worth unpacking each.

First, considering the current political environment, policymakers can propose an industrial policy that works within current parameters (extant coalitions, key players, current administrative capacity, etc.). This means policies may be more precise, politically pragmatic, and employ the existing pockets of state competencies. The rollout of green industrial policies across Europe has been an example of working within the existing political environment (see: Meckling 2019b) relative to larger carbon pricing reforms. Similarly, the multi-pronged nature of President Joe Biden's Inflation Reduction Act (IRA) has been criticized for its "everything bagel" objectives. Seen through the lens of political economy, however, the multidimensionality of the IRA—or "Green New Deal"-style policymaking more broadly—may make it more feasible by appealing to multiple constituencies.

Working within the current political equilibrium means that policies may look different than those that worked elsewhere. Political feasibility may require domesticating strategies to work within current political constraints. The world is "second best, at best," especially in the face of the innumerable political rules and dilemmas facing policymakers (Dixit, 2009; Rodrik, 2008). Take China's recent industrial policy. Comparative policy scholars have debated the extent to which China's policies are like those pursued by postwar East Asian economies. In some ways they are. Yet, there are important caveats. China's reliance on foreign direct investment (FDI) and its brand of *quid pro quo* joint-venture policy are seen as innovations that made industrial policy feasible within the constraints posed by Chinese politics, state capacity, and globalization (Huang, 2000; Eun and Lee, 2002; Thun, 2006). Our case study in Section 3.3 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 unique governance constraints.

Subject to the constraints of the current world, industrial policy may take forms that look unlike the *dirigisme* associated with the postwar era. Policies may resemble the "soft" industrial policies coined by Harrison and Rodríguez-Clare (2010): those where government, industry, and cluster-level private organizations coordinate on policy interventions. Such policies may carry lower fiscal footprints and administrative requirements, making them workable even in low-capacity environments. For similar reasons, policy may also lurk in the shadows. Block (2008) and others argue that US industrial policy never went away but became "hidden" when the political environment in the late 20th century made overt industrial policy taboo. Yet, through the lens of dynamic political economy, incremental, smaller-scale industrial policies today may well create the conditions for larger policies tomorrow. These dynamics lead to the second way industrial policy may be adopted.

Second, the political equilibrium can shift to one that accommodates industrial policy. That is, the political environment can change to one where those in power support policy

choices or larger reforms. How? First, a policy can empower those whose incentives are aligned with industrial policy. This may sound abstract, but it echoes debates around the political economy of policy reform (*e.g.,* Roland 2002), multilateral institutions empowering the political participation of rural poor (*e.g.,* Robinson 2010), and the wave of political science thinking around green industrial policy that creates constituencies for future carbon pricing (see below).[4] Alternatively, cases of industrial policymaking have coincided with dramatic shifts in the political environment, such as changes in political institutions and realignments in elite power. Some shifts may be exogenous and large, such as those that preceded the comprehensive industrial policies adopted in postwar East Asia.

East Asia's economic transformation was miraculous, but it was also preceded by a radical postwar political realignment. World War II and its aftermath altered the political environment in ways that facilitated "big" development policy: the collapse of Japanese imperialism; U.S. military occupation, with dramatic land reforms; support from Cold War allies (Johnson, 1982); and more, all worked to reorder domestic politics.[5] The independent economies were led by parties and elites whose agendas (and survival) depended on industrial policy. Industrialization was the raison d'être of single-party hegemons in Taiwan (the Kuomintang or KMT) and Japan (Liberal Democratic Party or LDC), and strong men in Singapore (Lee Kuan Yew) and South Korea (Park Chung Hee). Each had a symbiotic relationship with ascendant industrialists. Hence, the interests of political elites and capitalists aligned. In the case of Taiwan and South Korea, this alignment was only strengthened by the existential threat of Cold War crises (Kang, 2002; Lane, 2022). In other words, the new postwar political equilibria of East Asia and Singapore supported sweeping industrial policymaking as well as the economic reforms they required (*e.g.,* currency devaluation).

The point, however, is not that all industrial policy requires monumental shifts in the political environment. Indeed, large-scale industrial policies risk being untenable without amenable changes to the political environment. In this way, the industrial policies of the East Asia miracle economies likely do not translate well to many other contexts. Yet in key ways, contemporary industrial policy takes different forms than these historical policies. First, they are typically more small-scale (Juhász et al., 2022). Moreover, in many modern contexts, the practice of industrial policy is less about the government providing subsidies in a dirigiste, top-down manner, and more about the government working in partnerships with the private sector to solve key bottlenecks, coordinate across stakeholders and provide customized public inputs (Juhász et al., 2023).

[4]Certainly, this opens up questions as to the parameters of policy advice and the degree to which economists ought to internalize the political incentives of policymakers. See Dixit (1997) and Zingales (2020).

[5]Although scholars may emphasize the legacies of Japanese colonialism (Kohli, 2004), postwar reforms kneecapped their power, for instance, with sweeping land reform (Haggard et al., 1997). Notably, the US government took a different route with the Philippines, whose landed elite survived and never underwent true land reform.

To summarize, when "all industrial policy is political" it must be considered within the parameters of the local political environment. Doing so 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. Practically, this implies that policies that emerge in one political context are not guaranteed to work within another. Moreover, theoretically sound economic policies fail when policymakers ignore political spillovers of policy, especially those policies that impact the balance of power (Acemoglu and Robinson, 2013). These political spillovers of policy mean that "small" industrial policy may actually precipitate the conditions for larger reforms or even first-best policy. Industrial policy aimed at promoting alternatives to carbon-intensive activity, or green industrial policy, is an example of this.

2.3 Case - The Political Economy of Green Industrial Policy and Carbon Pricing

The recent experience of climate policy is a tale of political constraints. The comparative experience of green industrial policy and carbon pricing provides a clear example of why good economics does not necessarily translate into good politics. The political battles over climate policies illustrate how green industrial policies have emerged as complements rather than substitutes for carbon pricing policies. This complementarity is shown in their potential to shift political equilibria in support of carbon-pricing schemes.

"We're all Pigouvians now"

In the face of the climate crisis, economists have long advocated pricing carbon.[6] The market failures around carbon emissions present a glaring case for Pigouvian solutions, using tax or emissions trading schemes (ETS) to equate the price and social costs of carbon. There's a lot to like. In terms of economic efficiency, pricing carbon is seen as an important component of a first-best policy package.[7] It's low-cost, market-based, and less invasive than alternatives. If economists are unified in their enthusiasm for Pigouvian policies, the same cannot be said for green industrial policies. We follow Harrison (2017) in defining green industrial policy as those policies that promote green technology production or promote greener activity in traditional industries. Among economists, these policies are seen as far inferior to carbon pricing, especially in terms of efficiency (Maria et al., 2023). In the words of the former managing director of the International Monetary Fund (IMF), Christine Lagarde, "[p]rice it

[6]The "Economists' Statement on Carbon Dividends," which advocates for a U.S. carbon price, has been signed by twenty-eight Nobel Laureates in economics, four former chairs of the Federal Reserve, and fifteen former Chairs of the Council of Economic Advisors. (Source: https://www.econstatement.org/)

[7]Alongside the negative externality arising from carbon emissions, there is a second set of market failures associated with the innovation needed to provide low-carbon or carbon-neutral technologies. The first-best policy may be a combination of carbon taxes and directed innovation subsidies (Acemoglu et al., 2016)—a form of green industrial policy.

right, tax it smart, do it now" (Ball, 2018, p. 134). Yet economic enthusiasm has not translated into political enthusiasm.

In fact, green industrial policies have proliferated in recent years while the political success of carbon policy has been more complicated. Figure 1 illustrates the dramatic expansion of green industrial policy across G20 countries, measured as the count of new policies in a given year from the comprehensive global industrial policy dataset of (Juhász et al., 2022).[8] Although carbon pricing schemes have expanded steadily since the EU's Emission Trading System (EU ETS) in 2003, green industrial policies have mushroomed (Meckling, 2019a; Meckling et al., 2017), playing far more instrumental roles than economists would have predicted.

Figure 1 shows that green industrial policy activity doubled in middle-income G20 countries between 2015 and 2022 and increased more than forty-fold in high-income G20 countries over the same time period. Notably, across high and middle-income economies, governments tend to use fiscally demanding instruments such as financial grants and state loans to promote green industry (see: Figure 2). Consider just one type of green industrial policy, feed-in tariffs, which provide guaranteed long-term prices for renewable energy producers at above-market prices. A relatively obscure renewables industrial policy in the 1990s, it surpassed 132 national and sub-national policies by 2013 (Meckling et al., 2015; Bayer and Urpelainen, 2016). Notable expansions are seen across other green policies, such as local content requirements (Allan et al., 2021).

All the while, carbon pricing has faced political obstacles. Despite its efficiency, the political constraints have been formidable and politically costly for politicians (Furceri et al., 2023). Although the benefits of carbon pricing are clear, they are diffuse and realized in the future. Yet the costs are noticeably concentrated, often in ways that are politically perilous: falling onto both consumers and producers and across traditional economic (labor and capital) and political (left and right) constituencies (Mildenberger, 2020). Hence, the political conflict around carbon pricing has been far more contentious—and more distributional—than anticipated (Aklin and Mildenberger, 2020), inspiring a robust literature focused specifically on the political constraints (Jenkins, 2014; Karapin, 2016; Klenert et al., 2018; Cullenward and Victor, 2020). The political hurdles have led leading carbon pricing researchers to declare that political acceptability is a first-order concern, even over economic efficiency. Klenert et al. (2018, p. 669) argues "[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 then became pivotal antagonists in the politics of carbon pricing (Brulle and Downie, 2022; Basseches et al., 2022). The U.S.'s most prominent emissions trading legislation, the 2009 Waxman-

[8]This is the first comprehensive dataset on global industrial policy practice. We identify green industrial policies among the full set of industrial policies using a dictionary of words associated with climate policies.

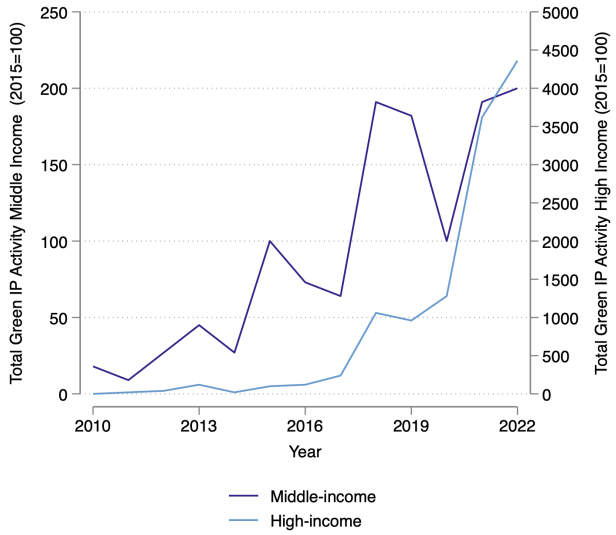

Figure 1: Green industrial policy activity in G20 countries, 2009-2022 (Total annual count of policies relative to 2015)

Notes: Green industrial policies relative to 2015, the year of the Paris Climate Accords. Green industrial policies are classified based on the industrial policies identified in Juhász et al. (2022), who use data from the Global Trade Alert. An industrial policy is classified as being "green" if the text of the policy description contains keywords associated with climate policies. High- and middle-income status is classified using data from the World Bank.

Markey bill, was sunk by profligate lobbying from expectant losers, including non-emitting industries indirectly exposed to potential losses (Meng and Rode, 2019; Cory et al., 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 (Harrison, 2012). Carbon pricing wins have also generated political blowback (Pahle et al., 2022), sometimes with dramatic reversals (*e.g.,* Australia, France, Switzerland, and the state of Washington).[9]

Politics have also constrained Pigouvian successes, where carbon pricing schemes may look different in practice from theoretical ideals and have less bite (Jenkins and Karplus, 2017; Ciocirlan and Yandle, 2003; Harrison, 2012). Carbon pricing wins—carbon taxes and trading systems alike—have required political bargains with varying degrees of industry exemptions and rebates (Haites, 2018; Khan and Johansson, 2022). The EU's ETS itself was a politically feasible alternative to the failure to pass EU-wide carbon taxes.[10] To garner early buy-in, the EU gambled by providing firms with carbon emissions allowances. Although the move cultivated industry support and constituencies for ETS, it also inspired intense lobbying efforts

[9]The experience has been smoother for early carbon tax adopters (Sweden and Finland) with more amiable political climates and weaker incumbents (Meckling et al., 2017; Harrison, 2010).

[10]Tax policy requires unanimous support from Member States, whereas the ETS was packaged as an environmental policy and faced lower political hurdles.

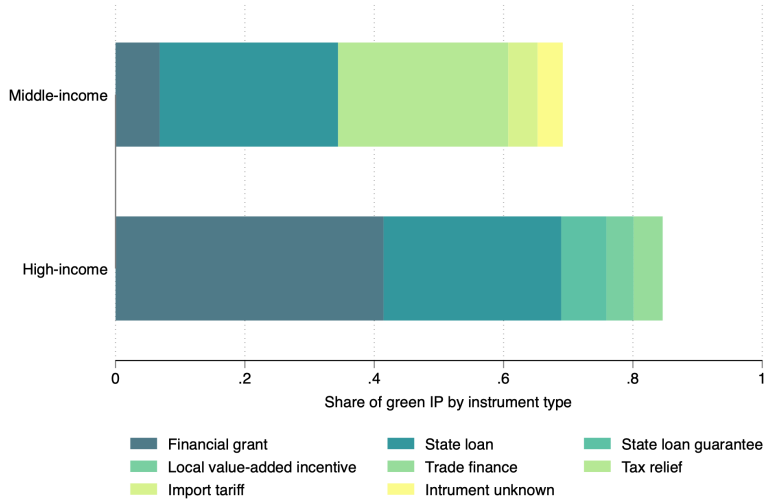

Figure 2: Top-five green industrial policy instruments across G20 economies by income group (2009-2022)

Notes: Green industrial policies by instrument type (top five instruments only). Green industrial policies are classified based on the industrial policies identified by Juhász et al. (2022), using the Global Trade Alert database. An industrial policy is classified as being "green" if the text of the policy description contains keywords associated with climate policies. High- and middle-income status is classified using data from the World Bank.

over allowances. The ETS subsequently experienced a significant period of "over-allocation" and depressed carbon prices (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).

The Quiet Political Revolution of Green Industrial Policy

Green industrial policy chugged alongside the political tumult of carbon pricing, as in the case of the feed-in tariff, a once-obscure measure that proliferated alongside the rollout of carbon pricing policies. Importantly, green industrial policies carry political advantages, evidenced by political successes (Harrison, 2017).[11] With concentrated benefits and diffuse costs, green technology industrial policies have been supported by both voters and firms (Meckling and Karplus, 2023) and may span regional constituencies. Gaikwad et al. (2022) show that US and Indian voters strongly support green energy investment across various political-regional constituencies, even divided ones. Likewise, recent policy packages serve diverse objectives: creating employment or regional industrial development (*e.g.,* Green New Deal-style programs in the EU and US). Yet this is seen in miniature across the smaller battles for green industrial policy across industrial democracies. Bayer and Urpelainen (2016) argue

[11]This is not to say there aren't failures, such as Ontario's feed-in tariff, nor other complexities, reviewed by Harrison (2017).

that intrinsic political appeal explains the proliferation of feed-in tariffs across democracies: its ability to woo renewable energy producers while simultaneously targeting influential rural constituents.

The political success of green industrial policies has, in fact, made them a potent political complement *and* precedent to carbon pricing. The scourge of industrial policy—creating political constituents—is a benefit when it comes to promoting the preferred carbon pricing policy. This observation has not been lost on political scientists and policy designers, who have noted that industrial policies provide a means of shifting the political equilibrium towards first-best policies.

In fact, green industrial policies preceded pricing policies in nearly two-thirds of the cases by 2013 (Meckling et al., 2015, 2017). This pattern has been documented across varying political settings globally (ibid.; Thurbon et al. 2023). California, in particular, has become a well-studied case in these feedback dynamics, where aggressive public support for renewable development dates back to the 1970s (Biber, 2013; Schmid et al., 2020; Meckling and Karplus, 2023). Here, 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 subsequent climate reforms (Vormedal and Meckling, 2023; Kim et al., 2016). These strategies echo the political economy thought around the optimal sequence of economic reforms in transition economies (Roland, 2002).

The political economy of climate policy—accounting for political realities—renders the narrow advocacy of Pigouvian pricing obsolete. Economically, efficiency matters, yet political feasibility is a binding constraint. The political economy of climate policy hints at the potential of a portfolio approach to climate policy, where green industrial policy plays a role. Increasingly, economists (Blanchard et al., 2023) and policy scholars (Rogge and Reichardt, 2016) see the advantages of multi-pronged approaches to addressing climate change. They do so by complementing current carbon pricing schemes and through their potential to shift the politics of larger-scale reforms that are surely necessary to confront climate change. Of course, 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 R&D that directly target the technological constraints facing industries (Harrison, 2017).

3 State Capacity Constraints

Industrial policy is ultimately performed by states. State capacity—the ability of the state to implement official goals and policies—is thus an essential constraint to getting industrial

policy right. The state's capacity to deploy developmental policy has become an essential ingredient in explaining long-run development and the divergent experiences of postwar industrialization (Evans, 1995; Dell et al., 2018). Just as East Asian economies are marked by their ability to pursue development policy, the postwar produced a rogue's gallery of regimes, such as those in the Philippines, Ghana, and Zaire– predatory states that became case studies in botched policymaking (Killick, 2010; Boyce, 1993). History is littered with five-year plans that vastly outstripped the ability of states to implement them. Historically, moves toward industrial policy have required thinking about state capacity, as seen even in the earliest forays into industrial strategy. Alexander Hamilton's vision of state-building lived alongside his program to promote domestic manufacturing, although never realized. If industrial policy entails shaping the economy, it also entails shaping the capacity of state institutions.

It would be wrong to think of state capacity as static and exogenous, however, especially in the world 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). South Korea and other postwar economies continually invested in bureaucratic capacity. 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).

This section considers the components of state capacity that are essential to industrial policy. Just as state capacity is not static, it is not monolithic. We focus on two dimensions of state capacity that dominate industrial policy considerations: i) bureaucratic capacity, the ability to implement policy, and ii) embeddedness and informational capacity, the ability of bureaucracies to interact with and exchange information with the private sector.

3.1 Bureaucratic Capacity and Autonomy

Implementing industrial policies requires *bureaucratic capacity*, or the ability of an administrative agency to carry out policies chosen by politicians. Policies need to be executed and monitored. Administrations need resources, capital, staff, technology, and knowledge to *do* policy. Industrial policies themselves can be particularly capacity-intensive to administer; they often require deep knowledge of the markets and firms they interact with, regular data, technical expertise, and more. Where dimensions of bureaucracy capacity matter for economic development (Besley et al., 2022), they surely matter for industrial policy. Where industrial policies are inevitably political, 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 use their discretion and independent authority to implement policies (Bersch and Fukuyama, 2023). Authority is delegated to bureaucracies tasked with implementing the industrial policies mandated by politicians. Given the political temptations surrounding industrial policies (see Section 2), the autonomy bureaucracies have over policy has been vital for successful industrial policy.

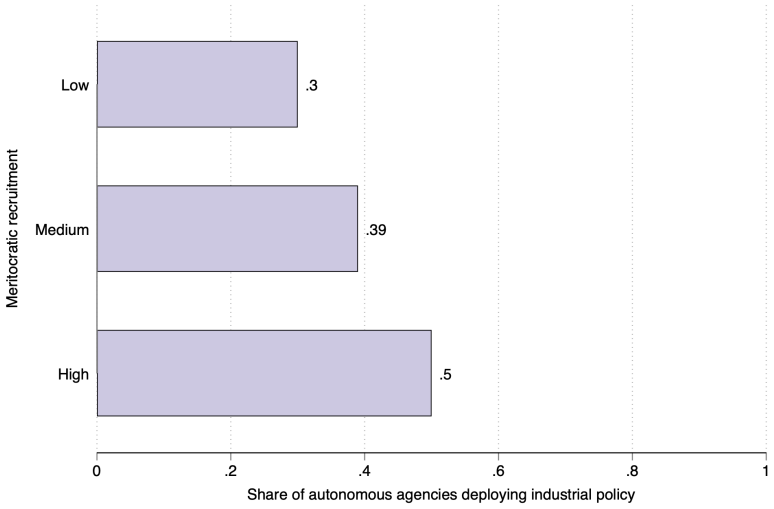

Figure 3: Share of autonomous agencies deploying industrial policies among G20 countries (2009-2022)

Notes: Agencies deploying industrial policy are classified based on industrial policies identified in Juhász et al. (2022) who use data from the Global Trade Alert. An agency is defined as being autonomous if it is i) structurally disaggregated from the government and ii) run by civil servants or other non-politicians. Data on meritocratic recruitment from the Varieties of Democracy (V-Dem) project. High, medium, and low meritocratic recruitment is defined based on tercile in the G20 country sample.

Yet, what does bureaucratic autonomy mean in practice for industrial policy? Figure 3 plots two measures of autonomy using data on the public entities that implement industrial policy from Juhász et al. (2022). The x-axis is the share of autonomous agencies administering industrial policy, defined as those that are both at arm's length to the government and run by non-politicians.[12] The share of autonomous agencies is broken down by a country's average level of meritocratic recruitment from the Varieties of Democracy (V-Dem) project (via Besley et al., 2022). Figure 3 shows that countries with high levels of meritocratic recruitment also tend to have more independent administrative bodies implementing industrial policy.

[12]Specifically, we classify public sector entities (e.g., cabinet positions, ministries, public agencies such as development banks, or state-owned enterprises) as being autonomous if they are: i) structurally disaggregated from the government; and ii) run by civil servants or other non-politicians.

Hence, Figure 3 conveys bureaucratic autonomy for institutions deploying industrial policy. Autonomy is promoted by limiting political interference in managerial procedures, staff hiring, and internal promotion decisions, reducing the constraints on bureaucratic operations, and more (Bersch and Fukuyama, 2023). For instance, the pilot development agencies in East Asia evolved to have elite selection criteria, meritocratic promotion, and long, stable career paths. Bodies were thus staffed by highly trained civil servants and enabled longer-run policymaking. Emerging evidence in economics on bureaucracies shows how politicized (Colonnelli et al., 2020) and discretionary selection (Xu, 2018) can lead to lower-quality policy outcomes, while depoliticizing bureaucratic selection can improve performance (Vannutelli, 2022).

Although bureaucratic autonomy is often concerned with the nuts and bolts of *implementation*, the autonomy of bureaucracies to *formulate* policy is likely essential for industrial policy *design*. Because industrial policies are complex, skill-intensive, and require careful consideration of appropriate instruments, there may be a case for delegating details of policy formulation to higher-capacity bodies.[13] In postwar Japan, the pilot industrial policy agency, the Ministry of International Trade and Industry (MITI), practiced what Chalmers Johnson 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.

Comparing the success of California's climate policies to Germany's more disappointing ones, 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, meaning that politics was not entirely absent from the policy formulation. Similarly, work by Fernández-i marín et al. (2021) shows that measures of environmental policy quality are associated with discretionary policy crafting power given to bureaucracies across OECD economies.

Despite the strong case for delegating industrial policy to autonomous bureaucracies, Figure 3 shows that much of industrial policy, nevertheless, is likely to be guided by political agents. Tellingly, in G20 countries characterized by relatively high levels of meritocratic recruitment, half of the agencies deploying industrial policy are politicized. Political economy tells us that there may be political rationales for why politicians may want policymaking to remain firmly in the political realm. After all, the decision to delegate and invest in bureaucratic autonomy, particularly with industrial policy, are ultimately political decisions made by politicians. Modern political economy reasoning is filled with reasons for why sensible economic reforms may not come to fruition, particularly in the case of distributive policies (Blinder, 1997; Alesina and Tabellini, 2007).

[13]We discuss the normative case for delegation to autonomous agencies in Section 2. 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).

Industrial policy almost certainly requires continual investment in bureaucratic capacity. First, most states are out of practice with the capacity-intensive forms of industrial policy that have emerged in a post-COVID world. Second, industrial policies have expanded rapidly (Juhász et al., 2022), and continual investment in bureaucratic capacity must follow. Third, the bureaucratic capacity to perform industrial policy is likely low; underinvestment is seen in the OECD, in presidential systems, and European democracies (Bednar and Lewis, 2024; Fernández-i Marín et al., 2023b,a). When capacity-intensive industrial policies are lobbed onto the growing portfolio of bureaucracies, the problem is compounded. State capacity does not fall from the sky nor is it static. We will go so far as to make this claim: repeated investments in administrative capacity are a *must*. You can quote us on that.

3.2 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. Industrial policy is not passively deployed from commanding heights, nor is policy static. 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 input from those with domain expertise. Firms may face a myriad of bottlenecks, from lack of financing, difficulties procuring land, skill shortages, and administrative barriers. New policies can reveal unforeseen constraints, such as the issues of local permitting issues revealed by the rollout of the Inflation Reduction Act's clean-energy credits in the US (Brouns, 2023). 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.

It matters how connected or "embedded" bureaucracies are with the private sector. The idea of *embeddedness*—the extent to which bureaucracies have connections with the business sector—was developed by Peter Evans to describe a key feature of developmental bureaucracies. 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 et al., 2005). Evans (1995) 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 intimately 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.

Yet, embeddedness is not unique to East Asia but informs industrial policy practice across high- and low-income economies, such as the US's ARPA model or Peru's *Mesas Ejecutivas* (known as *mesas* or ME) (Juhász et al., 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* helps identify market and coordination failures and, importantly, can triage and expedite solutions across bureaucracies. Bodies like *mesas* are notable in that they have a low fiscal footprint and, in fact, were an alternative to costly external consultations (Ministry of Production, 2016).

Hence, countries have pursued embedded institutions, big and small, within their political constraints. This is shown in seminal qualitative work by Breznitz (2007), who provides a positive political economy of how small open economies have chosen different embedded bureaucracies to move into information technology (IT) industries. Breznitz (2007) argues that embedded agencies were instrumental to Ireland, Israel, and Taiwan entering dynamic IT markets, yet did so with wide institutional variation. Where the Taiwanese state was directly involved in the industrial R&D process (e.g., Industrial Technology Research Institution), Irish agencies took a more advisory and advocacy role (e.g., National Software Directorate). These features shaped both the industrial policies that were chosen, and where countries entered fragmented supply chains. Hence, there is not a single Weberian recipe for success but many ways in which small open economies have coordinated entry into competitive global industries.

Among other things, embeddedness facilitates the flow of information between bureaucracy and industry. Doing so is essential given fundamental *informational asymmetries* between bureaucrats (principals) and the firms they interact with (agents). Consider a green industrial policy, where a public agency subsidizes risky projects that, if successful, would generate both private and social benefits. Depending on the information structure, moral hazard and adverse selection problems can arise. 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, whereas the opposite is true 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.

Meunier and Ponssard (2024)'s insights speak 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 became apparent with

some projects. Therefore, the agency introduced repayable advances, which are subsidies that need to be paid back in the case of success—that is, these are subsidies for failure.

Such informational asymmetries are not unique to industrial policy but are inherent across settings, particularly regulation and antitrust. These problems have inspired a storied literature on regulatory policy design and incentive mechanism (Baron, 1989; Armstrong and Sappington, 2007). Rather than rendering policymaking impossible, this literature highlights the importance of considering the institutional constraints bureaucracies face and the hard work necessary for designing policy under imperfect information conditions. 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 is particularly true 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 is one such example.

Embeddedness, however, can cut both ways. Dense links between the state and industry, on their own, also introduce the potential for capture and predation. Among other things, embeddedness requires the bureaucratic independence and autonomy described above (Section 3.1). This balancing act is what Peter Evans famously called "embedded autonomy" (Evans, 1995), 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? After all, these are political decisions. Our final case study below shows how 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.

3.3 Case Study - Mimicking the Miracle: Export-Led Industrial Policy in Thailand

At the crest of the East Asian growth miracle, Southeast Asian countries adopted the East Asian "secret sauce" with varying levels of success. Thailand is a useful lens for considering how political and capacity constraints shaped their ability to pursue East Asian-style export promotion.

Constraints to Export Promotion in the 1970s

Export enthusiasm came to Thailand in the early 1970s under the government of Field Marshal Thanom Kittikachorn (Hewison, 1987; Kaosa-ard and Israngkura, 1988). East Asia's experience resonated with technocrats and aspirations of export promotion marked Thailand's Third Five-Year Plan (1972-1976) and the Export Promotion Act in 1972. Since the 1950s,

Thailand's military-dominated governments pursued an inchoate form of import substitution industrialization (ISI) (Unger, 1989; Rock, 1995). Thai-style ISI did not embody grand developmental strategies but served important practical (in terms of trade and revenue) and political purposes, helping maintain fragile postwar politics. Despite export enthusiasm, a fundamental constraint to implementing it was that ISI was hard to move on from.

Instead, Thailand pursued a contradictory mix of export promotion and ISI, or a type of "export-oriented protectionism" (Poapongsakorn and Fuller, 1997, p. 480). South Korean export policies allowed *de facto* import liberalization for exporters (Westphal, 1990). Thai policy did not; although exporters were given rebates from protectionist policy, they were insufficient and mismanaged (Akrasanee, 1980; Christensen et al., 1990; Herderschee, 1993). Where South Korean export policy allowed access to critical machinery and intermediate imports for export production (Lane, 2022), Thailand protected these goods without adequate relief for exporters, and even raised protection for capital goods through the decade (Wiboonchutikula, 1987; Akrasanee, 1980).

Along with Thai politics, 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. Rather than being insulated from politics, developmental bodies were vehicles for patronage, and a bureaucratic spaghetti, replete with duplication, provided ample opportunities for patrons (Rock, 1994; Doner and Ramsay, 2000). The effect was a balkanized and fragmented developmental apparatus (Crouch, 1984; Leftwich, 1995). The Thai Board of Investment (BOI), 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 South Korea developed systems for scrutinizing export incentives in the 1960s, Thailand's 1970 export strategy lacked such capacity, and poor administration created bottlenecks for producers.

Another important factor in the 1970s precluded an export push: an overvalued Thai baht. Thai political constraints made devaluation improbable, unlike postwar Taiwan and South Korea, whose politics allowed—or even compelled—them to pursue politically difficult devaluations before export promotion. In Thailand, powerful constituents, from business groups to military elites, favored a strong baht (Doner, 2009, pp. 110–111). A strong currency benefited multiple factions: importers, the military's foreign procurement, and firms borrowing US-denominated capital (Doner and Ramsay, 2000; Werr, 1993). The status quo would remain until the 1980s.

Political Origins of Export Promotion Breakthroughs in the 1980s

Only in the 1980s did a coherent export-promotion policy emerge, 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; Rock, 1995). 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: "(...) no 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 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. Investments in state capacity created the conditions necessary to rationalize economic and industrial policy. Combined with pressure from Structural Adjustment Programs, this climate allowed the Prem government to push through currency devaluations in 1981 and 1984, despite strong resistance from the military and incumbents. Although politically costly, the move symbolized fledgling state autonomy. Under Prem, Thailand shifted from a clientelistic state to a form of "liberal corporatism," where a relatively autonomous state bargained with key constituents (Laothamatas, 1994).

Embedded private-public bodies proliferated through the 1980s and were seen as instrumental to export promotion (Doner and Ramsay, 1997) and Thailand's development success more broadly (Doner and Ramsay, 2000). Most famously, the Joint Public-Private Sector Consultative Committee (JPPCC) was established in 1981 and conspicuously modeled after Japanese institutions. Chaired by the prime minister, the JPPCC convened monthly meetings between state agencies and business groups to coordinate policy and elicit information on export incentives (Muscat, 1994, pp.176–177; Doner, 2009, p. 111). Thailand also followed the path of Korean export agencies, launching a successful Department of Export Promotion (Rock, 1995). Such reforms facilitated a more robust export strategy; import protection offsets, ineffective in the 1970s, were 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 (NESDB), 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.

Although the political environment of the 1980s supported a more robust export-oriented policy, the Thai route was distinct. While commentators drew parallels between Thai private-

public efforts and East Asia, ascendant business groups and lobbies exercised far more power over the state than in NICs. Although outward-oriented interventionism echoed aspects of South Korea's, Thailand could not fully pursue key pillars of Korean policy (*e.g.*, de facto import liberalization for exporters), nor could they adopt the more complex industrial policies seen later across the NICs (Christensen and Siamwalla, 1993; Doner, 2009). 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, 1995, 1994).

Thailand illustrates the main messages in our paper. First, the political environment and capacity constraints inhibited the wholesale adoption of East Asian-style export-oriented industrial policy in the 1970s. Second, however, 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 1980s showed the importance of investment in bureaucracy, including deliberative institutions that worked well within Thailand's political economy.

4 Conclusion

Variation in industrial policy practice is as much political as it is economic. Market failures and economic constraints govern how economists view optimal policy, yet the political forces—especially the two dimensions of our framework—influence how these interventions are realized. This 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 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 alone is far underdeveloped relative to practice (Juhász et al., 2023), the positive political economy of industrial policy is even more anemic.

This paper has considered two prominent governance constraints to industrial policy. While policymakers and economists ignore these at their peril, our analysis highlights that good industrial policy can and has been deployed within these constraints in various contexts. Unlike an older tradition of public-choice-informed views of government failure, our take offers a pragmatic and carefully optimistic view of the possibility of overcoming government failure and working within governance challenges. At the same time, this paper is but a small step towards a modern political economy of industrial policy. Our hope is that the revival of

industrial policymaking will inspire more careful work on the positive and normative political economy of good industrial policy.

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